

Adoption of social policy for marine waste management to improve environmental degradation for sustainable beach tourism

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Abstract | This research aims to study the social policies of marine waste management implemented to mitigate environmental degradation and promote sustainable beach tourism, focusing specifically on the initiatives of local government administrators. Existing research has predominantly focused on green and eco-tourism, often overlooking the critical role of marine waste management. Thus, the objectives of this research are: 1) to examine the adoption of social policies initiated by local government administrators in managing marine waste and their impact on mitigating environmental degradation for sustainable beach tourism; and 2) to determine the extent of the effectiveness of the guidelines for activities on how to reduce marine waste in order to alleviate environmental degradation. The study area covers Koh Chang Island, which is a popular beach and coastal tourist attraction. The methodology employed a qualitative approach to collect the data, which involved eight participants undergoing three sets of semi-structured interviews. The content analysis of the findings indicates that the social policy framework implemented by administrative efforts in marine waste management can bolster policy coherence and implement activities to enhance the environmental conditions that are crucial for preserving beach tourism destinations. In the discussion and the conclusions sections, the importance of increased awareness, promotion of the eco-friendly behaviours of stakeholders, implementation of practical measures, and enforcement of regulations are presented. Additionally, the involvement of government administrators is deemed indispensable. Lastly, this study acknowledges its limitations and offers recommendations for future research.

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1. Introduction

Tourism has the potential to provide travellers with memorable destinations and experiences (Mestanza et al., 2019). Access to the natural environment, opportunities for relaxation, and conveniences such as the availability of refreshments and beverages, as well as sanitary facilities, are essential for ensuring a strong positive impression on tourists. Nevertheless, careful consideration of the negative impact of the long-term growth of tourism on destinations is required in order to offer positive experiences for generations of future travellers. According to the United Nations World Tourism Organisation (UNWTO) (2017), the long-term impact of tourism results from various factors including seasonal increases in visitor numbers, diverse sources of waste, and the vast increase in recreational facilities. Regulation of the tourist numbers is one possible approach to tourism management; however, this may lead to disruption of economic development and subsequently prove to be unsustainable (Grilli, Tyllianakis, Luisetti, Ferrini & Turner, 2021). In particular, island beach tourism on the eastern coast of Thailand, which is regarded as a major destination for green tourism, is faced with environmental challenges despite being included in current policy initiatives and economic development plans (Eastern Economic Corridor, 2022). At many of the region's recreational areas and beaches, sustainable management of environmental impacts is a struggle (Prayaga, 2017). In addition, three out of the five provinces in Thailand's eastern region have some of the highest volumes of uncollected marine debris and waste in the country (Bangkok Post, 2022), which causes these beach tourism destinations to be increasingly sensitive to environmental concerns, particularly with regard to aesthetic pollution.

Thus, for the development of sustainable tourism, effective solid waste management (SWM) is essential, particularly with regard to marine waste management (MWM). Therefore, both tourism and environmental sustainability can be positively affected by improvements in MWM (Amasuomo & Baird, 2016). However, local governments in a large number of developing countries often lack the operational capacity to manage the increasing volumes of marine waste adequately, which leads to a low level of efficiency in MWM systems (Khan, Anjum, Raza, Bazai & Ihtisham, 2022). Thus, promotion of sustainable tourism practices and protection of the environment of popular tourist destinations requires that these issues be addressed (Bellia,

Scavone & Ingrassia, 2021). The consideration of the concept of synergy and the participation of multiple stakeholders are also crucial for the achievement of sustainable improvement in the MWM at the beaches of island tourist destinations. This collaborative approach can enhance MWM performance in seaside recreational areas, which have previously faced numerous challenges (Minelgaitė & Liobikienė, 2019). Similarly, the study of Jotaworn and Nittivattanon (2021) stated that, to reach the goal of sustainable enhancement of waste management in the coastal tourism destinations, especially in the Eastern Economic Corridor region, there needs to be consideration of the synergy concept and multi-stakeholders for enhancing the SWM performance of beach recreation areas.

Koh Chang (Elephant Island), located in the eastern part of Thailand, is an island where the natural environment is still relatively intact. Its beauty is defined by the pristine beaches featuring clean white sand, crystal-clear waters, and a serene ambiance, as well as the local residents' traditional lifestyle. Tourist attractions on Koh Chang include the beautiful sea in Trat province as a summer destination and White Sand Beach, which, as its name suggests, features fine white sand. It is one of the must-visit places when travelling to Koh Chang. This destination is especially lively, as travellers from around the world come here to sunbathe and swim in the sea. However, Koh Chang faces issues with waste, which has led to environmental problems. The Koh Chang Marine National Park comprises over 31 islands in open-sea areas, resulting in a significant amount of waste each year. Human-generated waste both floats and sinks into the sea in large quantities, affecting rare marine animals such as turtles and dugongs, as well as underwater corals. Particularly in the Rang, Kra, and Wai archipelagos, which have beautiful corals, waste management is crucial for maintaining the marine richness of Koh Chang Marine National Park as a renowned tourist destination.

One government officer, the head of Koh Chang Marine National Park, stated that each year, Koh Chang attracts over 300,000 tourists, generating approximately 29 tons of waste per day. During the peak tourist season, the amount of waste increases to more than 35 tons per day. If left unaddressed, this issue will have long-term impacts. To tackle this challenge, Koh Chang Marine National Park has organised activities to foster cooperation between the public and private sectors, involving government officials. What is concerning is that most of this waste is generated by travellers visiting the area of Trat Province who lack awareness and discard it into the sea. In addition, communities living near the sea, including both Thai and Cambodian people, often throw bottles and other trash into the ocean, which is then washed ashore during

the monsoon season. Resolving this problem requires collective effort, as Koh Chang Marine National Park cannot tackle it alone. Additionally, some waste comes from the waters of neighbouring countries; however, the amount is not significant. By implementing the “low carbon” concept, which emphasises the tourism activities that avoid increased emissions of greenhouse gases or carbon dioxide through the use of marine waste management, the aim of the local inhabitants is to develop a model of tourism sustainability that mitigates the negative effects of tourism on both their community and the environment. The Designated Areas for Sustainable Tourism Administration (DASTA) has therefore been established as a public organisation to initiate tourism activities based on the principles of the low-carbon concept, and Koh Chang Island is currently being transformed into a low-carbon destination in compliance with the DASTA vision.

Koh Chang Island provides an important case study for sustainable tourism development. Marine waste management is essential for improving environmental conditions, supporting the low-carbon concept, and transitioning Koh Chang into a green tourism destination. Effective social infrastructure provided by the government is also critical (Parker, Brown, Jusu-Sheriff, & Manley, 2023). This study primarily examines the social policies of the local government that are implemented in the management of marine waste. It also evaluates the effectiveness of the guidelines aimed at reducing marine waste in order to mitigate environmental degradation and promote sustainable tourism. The article is structured as follows: introduction, literature review, methodology, results, discussion, and conclusions.

2. Literature review

2.1. Marine waste management in beach tourism and stakeholders’ involvement

Marine plastic pollution has garnered significant attention across various sectors, including the environmental, economic, scientific, technological, and political arenas, due to its severe impact (Kandziora et al., 2019). Subsequently, it has emerged as a prominent topic in global governance and cooperative efforts. Statistics reveal that global plastic production is increasing by 200,000 tons annually, with cumulative production projected to reach 33 billion tons by 2050 (Bhuyan et al., 2021). This massive production has led to approximately 10% of plastics entering the oceans, eventually infiltrating the human food chain and posing health risks (Pauna, Buonocore, Renzi, Russo & Franzese, 2019). Research conducted on marine plastic waste is a

growing field, with significant progress already being made, and it is anticipated that scholarly articles investigating marine microplastics will increasingly proliferate in the coming years. Due to the complex issues involved with marine plastic waste pollution, an interdisciplinary approach is required. Categorisation of marine plastic waste includes land-based and sea-based. Sea-based plastic waste originates from coastal tourism, shipping, marine aquaculture, and fishing. Plastics reach the oceans via rivers and waterways and are propelled by monsoons, ocean currents, tides, and other natural forces.

Stakeholder management is a comprehensive approach that involves managing marine waste and coordination of various levels of stakeholders in order to deal with marine waste and maintain the sustainable tourism development of destinations (Freeman, 2023). In the field of sustainable tourism, Havarangsi and Vithayaporn (2024) studied the multilevel involvement of stakeholders, which included the local communities, non-governmental organisations (NGOs) and government agencies, as well as tourists, businesses, and additional relevant groups concerned with marine waste management. As Eweje, Sajjad, Nath and Kobayashi (2021) stated, the key aspects of marine waste management for improving environmental degradation at beach tourism destinations are collaboration and communication. Proper policies and effective guidelines for implementation at different levels are also crucial for reducing marine waste (Eskerod, Huemann & Savage, 2015).

Community involvement is considered critical because local communities are key stakeholders in the management of marine waste. By including them in the decision-making processes of the tourism industry and sharing the benefits resulting from tourism can help to build a sense of pride and responsibility in the maintenance of environmentally friendly practices in the area (Bridoux & Stoelhorst, 2022). It is vital that support is provided by the government and regulations are implemented, as tourism policies and regulations are shaped by government agencies. Stakeholder management includes collaborating on the development and enforcement of guidelines for sustainable tourism, zoning regulations, and measures for conservation with these entities, thereby allowing the local municipalities to become essential stakeholders (Johnson-Cramer, Berman & Post, 2017).

Furthermore, engagement with the private sector is also necessary. Involving businesses such as hotels, tour operators, and transportation providers in the tourism industry is critical; however, the private sector must be aligned with the policies implemented by the local government administration. Therefore, the public sector, such as the local government

administration, plays a major part in improving the response of marine waste management to environmental degradation (Havarangsi & Vithayaporn, 2024). Maintenance of sustainable tourism destinations can be significantly facilitated through encouragement of environmentally responsible practices and the offering of incentives to adopt sustainable measures (Pedrini & Ferri, 2019; Khojastehpour & Shams, 2020). Implementation of proper policies leads to beach tourism destinations being able to gain benefits from the inclusive and comprehensive efforts to protect natural and cultural assets, improve the experiences of visitors, and develop sustainable economic resources for the local communities.

2.2. Social policy of marine waste management for improving environmental degradation

Social policy is focused on how societies worldwide address essential human needs, including security, education, work, health, well-being, and environmental concerns (Van Buuren, Lewis, Peters & Voorberg, 2020). It involves the ways that governments and communities tackle challenges related to human well-being. In the context of tourism, social policy can play a role in mitigating the environmental degradation caused by tourism activities (Huang & Kim, 2020), and the consideration of proper tourism policies that can be implemented to alleviate the environmental impacts resulting from tourism activities (de Oliveira, Soares & Solla, 2024).

Wichai-Utcha and Chavalpanit (2019) studied the vulnerability of marine ecosystems to contamination by human activities. Recently, the presence of emerging pollutants, such as nano plastics and microplastics, has increasingly affected pristine environments associated with beach and coastal tourism. Historically, oceans have been used as disposal sites for industrial waste, chemicals (including chemical weapons), wastewater, garbage, and other terrestrial waste. Although the dumping of certain substances, such as radionuclides, has been prohibited in recent years, these pollutants that result from both tourism activities and industrial enterprises continue to pose environmental challenges (Isarangkura, 2022).

Numerous studies conducted by stakeholders in marine waste management within the beach or coastal tourism sectors, largely overseen by the government offices of local municipalities, have primarily been focused on the methods of waste disposal (Mashali, Elbeltagi, Motawa & Elshikh, 2023). These investigations are typically linked to the administrative bodies that are responsible for the decision-making, legislation, and taxation pertaining to the management of waste within their respective jurisdictions, whether at the city, town, or state level (Chisholm et

al., 2021). Subsequently, research interest has shifted towards the formal private sector, which often operates as contracted partners in the handling of marine waste (Yue, Liao, Zheng, Shao & Gao, 2021). Recently, there has been a growing emphasis on the informal sector of marine waste management, which includes scavengers and garbage collectors, although this trend has tended to neglect significant contributors to beach recreation, such as the resorts and hotels, shops and restaurants, and other beachfront recreational facilities, as well as fishing enterprises (Stroebe, 2018).

Moreover, various stakeholders have independently conducted studies investigating green capacity and utilised the findings as benchmarks for sustainable waste management. Key indicators of green capacity within the private sector include measures such as reduction of pollution, mitigation of environmental degradation, resource conservation, and reduction of carbon intensity. Conversely, the public sector focuses on green performance indicators to gauge environmental competence (Cervantes, Martínez, Hernández & de Cortázar, 2018).

A tripartite service model was utilised to foster synergy among the various stakeholders in areas with green tourism. This model encompasses service providers (local authorities) and service recipients (residents and tourists), as well as a third sector that incorporates the ecosystem as an element in the area studied. The ecosystem functions as a resource integrator for both the service providers and the recipients (Widana & Utama, 2020). Additionally, Abirami (2024) stated that the “third sector” refers to the private leisure sector located along the beaches, including the accommodations and various commercial activities. The ecosystem formed by these three sectors can be viewed as representative of the natural environment, manifested through the activities of the third sector within the target destination.

As no comprehensive examination of the synergies among multiple stakeholders aimed at enhancing marine waste management performance through beach recreation has been undertaken, there are existing gaps in the literature (Kumar et al., 2017; Roy, Rautela & Kumar, 2023; Singh, Laurenti, Sinha & Frostell, 2014). This study thus seeks to address this research gap by identifying the various methods by which synergies that are not only able to contribute to academic discourse and practical applications but also facilitate achievement of its primary objective can be fostered.

2.3. Improvement of environmental damage for sustainable beach tourism

The concept of sustainability, based on “green” or ecological tourism that promotes beach and coastal leisure activities that provide support for beach tourism as opposed to damage, is gaining attention (Oka, Antara, Ruki & Darmayanti, 2022). Green tourism involves engaging in leisure activities in beach and island areas, apart from resorts and urbanised coastlines (Jopp, Mair, DeLacy & Fluker, 2015). This sector includes both the tourism industry, and the government agencies focused on beach tourism and assessing the impact on the cultural, social and economic aspects, as well as the physical environment (Law, DeLacy & McGrath, 2017). The rationale for promotion of greenery in beach and island tourism is multifaceted (Aigbedo, 2021). It aligns with new policies, addresses the need for improvement of the policies related to environmental degradation of beach and island areas, bolsters ecosystem conservation efforts, educates resident dwellers about beach areas, and meets market demands for innovative tourism experiences (Giampiccoli, Mtapuri & Dluzewska, 2023). When implemented correctly, beach tourism can significantly contribute to sustainability in all aspects of the economy, environment and society, while also providing a robust economic foundation by securing the number of tourist arrivals that also contribute to the social aspects in local communities, and ultimately the improvement of environmental conditions (Amasuomo & Baird, 2016).

Many scholars define beach tourism as overlapping yet distinct in terms of tourist behaviour. While beach tourism occurs in beach, coastal, and island areas, it is characterised by tourists who are critically aware of consumption practices that are harmful to the environment and seek to incorporate ecological consciousness into their decisions while traveling. The term “green” suggests behaviours that are ecologically responsible, akin to its use in terms such as “green party” and “green consumer,” that contribute to environmental quality. Thus, tourists’ green behaviour can be described as a category of tourism that places emphasis on practices that are sustainable and environmentally responsible, with an aim to minimise negative environmental impacts and promote eco-friendly behaviours during their travel experiences (Aigbedo, 2021).

Both green tourism and ecotourism focus on nature-based experiences but differ in their target audiences and objectives. Ecotourism is geared towards individuals interested in learning about the natural environment during their travels, whereas green tourism specifically encourages urban dwellers to spend holidays in beach and island areas in order to relieve daily stress and connect with nature. It is also important to distinguish green tourism from other areas (Hall, 2021). Likewise, Grilli et al. (2021) differentiated green tourism from resort tourism, noting

that the latter, though also rural, involves substantial physical development and modern amenities such as golf courses and ski resorts.

Based on the study’s background, the statement of the problems, the study’s rationale, the research question and objectives and the relevant literature review, the conceptual framework was constructed to provide guidance regarding how the research objectives of the study can be achieved. Hence, the diagram illustrating the conceptual framework diagram is illustrated in figure 1.

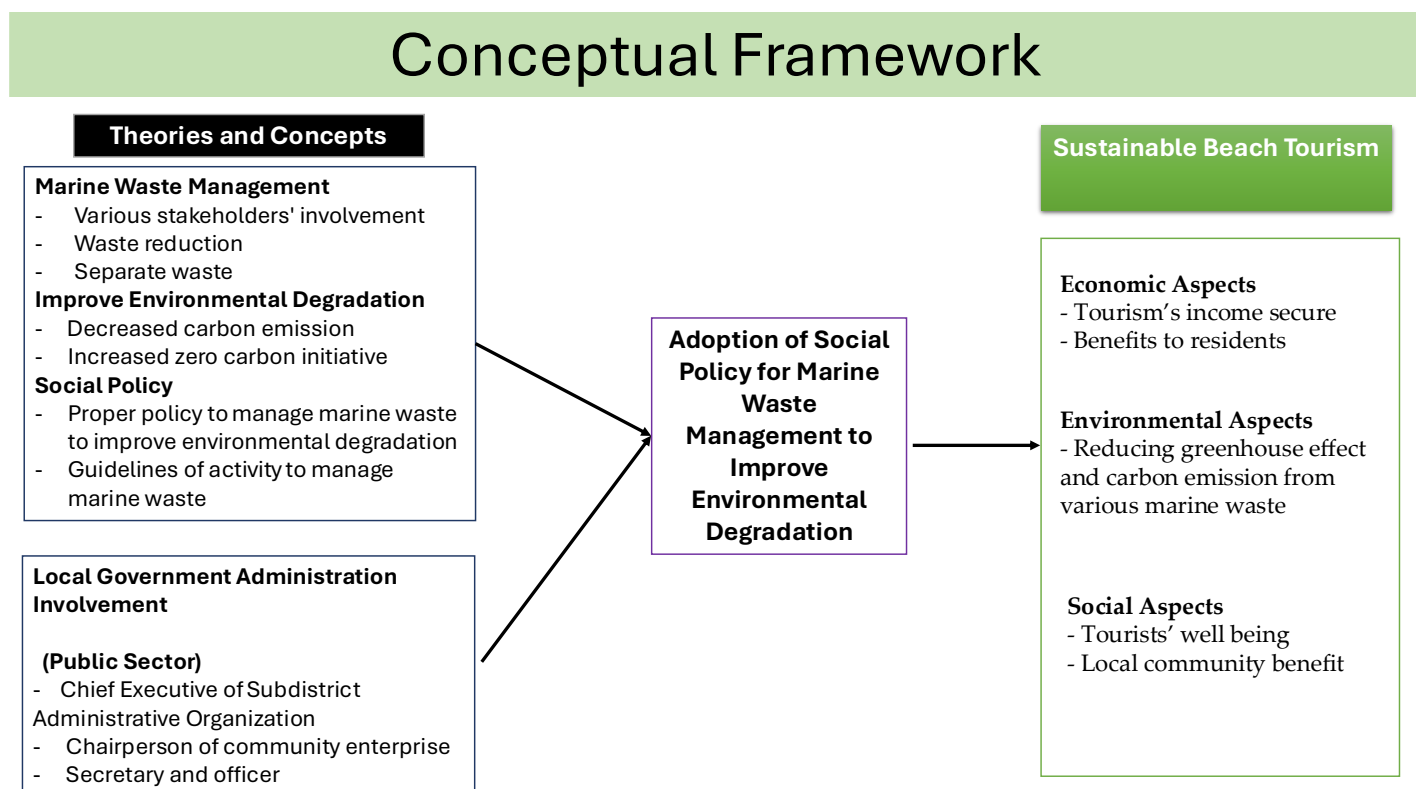


Figure 1: Conceptual framework diagram of this study

Source: Authors' Elaboration

3. Methodology

3.1. Research design and approach

In this study, a qualitative approach incorporating semi-structured interviews with the participants was utilised. Typically, qualitative research involves four key stages: research

design, collection of data, analysis of the data, and report writing. The main goals of qualitative research are to understand the contexts in which decisions are made, and actions are taken by individuals or groups, and also to explain why specific phenomena occur in particular ways. Additionally, semi-structured interviews are valuable for obtaining detailed responses to specific research questions and providing accurate information that can be applied to meeting the research objectives (Queirós, Faria & Almeida, 2017).

To conduct the semi-structured interviews, the relevant research and secondary data, especially from the Eastern Economic Corridor Office (EEC), was compiled along with the results of the primary data. Purposive sampling, a technique commonly applied in qualitative research, was employed to select a sample that was the best fit for the aims of this study, on the basis of the areas of expertise of the researcher. This approach is applied for the comprehensive collection of knowledge related to a specific phenomenon or population of interest. As recommended by Queirós et al. (2017), in qualitative action research, the number of participants should range from three to thirty in the sample size determination. Hence, for this study, eight participants who were involved in marine waste management in the local government office on Koh Chang, Trat Province, Thailand, were selected using purposive sampling. Three criteria were used for selection of the participants: 1) they worked as Thai government officers in the local government administration of Koh Chang, 2) they were involved in the waste and marine waste management section in the local government administration office, and 3) they had worked for at least five years of service.

3.2. Study area

Koh Chang (Elephant Island) is situated in the eastern part of Thailand, in Trat Province, and is the country's second largest island and a primary destination for tourists visiting the Koh Chang Marine National Park, which encompasses numerous pristine islands (Figure 2). Located approximately 300 km east of Bangkok near the Cambodian border, Koh Chang is 70% covered by unspoiled natural rainforest. The increased involvement in tourism of the permanent residents of the island has only recently occurred during the past decade as development has been undertaken.

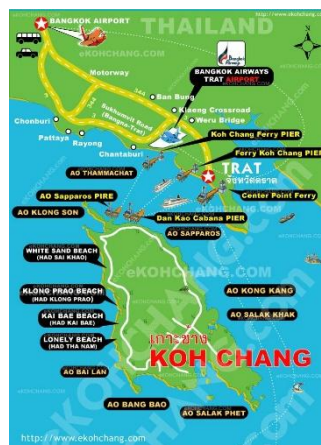


Figure 2: Study area

Source: The Eastern Economic Corridor Office (2024)

3.3. Data collection and analysis

For this research, conducting semi-structured interviews with influential persons having the capacity to influence decisions made in the future was selected as the essential approach. Consequently, the selection of individuals specifically included a broad range of positions in the local government administration. The interview sessions involved representatives of the public sector, such as the those of the Subdistrict Administrative Organisation (SAO), the municipal director, the chairperson of a community enterprise, and other related positions. Furthermore, selection of the interviewees was based on their knowledge and experience in areas that are relevant to this research, namely environmental protection, expertise in green strategy, local governance, policymaking, waste management, and various related fields. Anonymity of all participants was maintained throughout the entire research process, as all the participants remained anonymous throughout the stages of analysis and feedback. This is consistent with the nature of qualitative research, which aims to reach a stabilised point of view rather than establish a consensus.

In this study, three interactions and three sets of interviews were conducted to determine each individual's opinions. Typically, qualitative research involves more than one set of interviews in order to ensure data saturation and avoid the absence of new ideas or findings, which aligns with the findings of Havarangsi and Vithayaporn (2024). Therefore, three sets of interviews were deemed appropriate in this case. While written questionnaires are used in most studies, other methods, for example group interviews, in-person interviews, interviews conducted by phone or email, or online conferencing are also occasionally employed. In this research, in-

person, phone, and email interview procedures were chosen in order to achieve faster response times and eliminate the need for postage costs. Data collection was conducted during 10–13 August 2024 for the field observations, and interviews were conducted from 30 October to 4 November 2024.

Each of the three sets of interviews conducted during this research had a specific objective:

1. Phase 1: Topics of general interest were first discussed with respondents to identify their overall opinions about alleviation of environmental degradation through marine waste management. Therefore, the following questions were asked: Are you aware of the marine waste situation on Koh Chang? How does stakeholder involvement improve marine waste management?
2. Phase 2: Discussion was conducted to identify a set of variables that can explain the phenomenon being studied. Therefore, the following questions were asked: Which factor is the most important in the creation of marine waste on Koh Chang? In your opinion, who makes the greatest contribution to marine waste on Koh Chang?
3. Phase 3: Deeper issues were discussed to highlight the aims and options concerning the variables that were identified in the earlier phases. Therefore, the following questions were asked: What policies should the government or local administration implement to reduce marine waste in destinations located in coastal and beach areas? What are some of the ways you can initiate zero-waste behaviour within the responsibilities of your position? From all of these marine waste management activities to alleviate environmental degradation, what is your suggestion for tourism sustainability?

In the first phase, the main aim was the initiation, facilitation, and expansion of discussions on topics of general interest regarding their opinions on marine waste management that utilised both open- and closed-ended questions, which provided participants with the opportunity to freely share their ideas, insights, and opinions. The researcher, playing the role of mediator, meticulously analysed and synthesised the diverse inputs from the participants by focusing on identification of the topics and insights obtained. These insights gained from Phase 1 were intended to inform the design of the more specifically focused questionnaires used in Phase 2, enabling a deeper exploration of the particular subjects related to improving marine waste management in terms of identifying the largest contributors of marine waste on Koh Chang Island. As a fundamental component of the policy Delphi method, this iterative process

facilitated the collection of valuable insights from the panel of experts and helped to refine the research questions and the focus of the study as the research advanced.

In the second phase, the study focused on exploring specific topics more deeply and compiling opinions on the variables identified and discussed in Phase 1. With this goal in mind, specific questions on the factors that create marine waste and who is the largest contributor were given to participants. This phase allowed for a more in-depth examination of the significant variables identified earlier with the aim of understanding their significance and impact. Finally, in the third phase, the objective was to obtain more consensus-based opinions. The variables derived from Phase 2 were analysed, and the interviewees were requested to discuss the opportunities for implementation in relation to reducing marine waste in order to mitigate the effects of environmental degradation.

The participants were also invited to consider the feasibility of specific proposals being possibly implemented as policy goals in the alleviation of environmental degradation in beach tourism destinations. The aim of this stage of the discussion was to evaluate the potential practicality and effectiveness of the highlighted options. Finally, the priority goal was determined so that opinions on the benefits of specific policy objectives for marine waste management could be elicited. The qualitative method of content analysis involves the systematic and objective description and quantification of specific phenomena through the use of valid inferences derived from visual, verbal, or written data. In addition, content analysis is employed to identify and highlight the shared and unique challenges, opportunities, and requirements of the target participants. In this study, NVivo, a computer-assisted qualitative data analysis program, was used for the facilitation of organising and analysing the large datasets (Brandão, 2015).

4. Results

To achieve the research objectives, namely 1) to examine the proper social policy of local government administration in managing marine waste, and 2) to investigate to what extent the effective guidelines can facilitate reduction of marine waste and mitigate environmental degradation for tourism sustainability, the distribution of the units of analysis related to the demographic variables of the participants in the study were summarised as seen in table 1.

Table 1: Demographics of the participants

Categories	Participants	No.
Gender	Male	6
	Female	2
Education	Master's degree or higher	2
	Bachelor's degree	
	Below bachelor's degree	6
Participants	- Chief Executive of Sub-district Administration Office (SAO) (A)	1
	- Chairperson of Community Enterprise (B)	1
	- Secretary of SAO (C)	1
	- Senior officers (D)	3
	- Officers (E)	2

Source: Authors' Elaboration

The participants had worked at various levels in local government administration for over five years and had been involved in waste or marine waste management tasks. The criteria for selecting participants were mentioned earlier in the methodology section. All participants were designated A, B, C, D, or E. When interpreting their answers, these labels were used accordingly.

Open coding of data

The data analysis was structured into three distinct phases of interviews in order to gather insights into marine waste management and its impact on alleviating environmental degradation on Koh Chang. These phases were designed to progressively explore the respondents' awareness, identify key variables, and provide recommendations for sustainable solutions. Table 2 shows the summary of the data analysis through the three phases of the interviews, whilst the results of the original statements obtained from the participants are shown in the appendix.

Table 2: Summary of data analysis

Semi-structured interviews	Description
Phase 1	<p>General Awareness and Stakeholder Involvement. In the initial phase, the discussion focused on respondents' general understanding of marine waste issues on Koh Chang and the role of stakeholders in addressing this problem. These key findings emerged:</p> <ol style="list-style-type: none"> 1. Participants demonstrated varying levels of awareness about marine waste problems, with most acknowledging its detrimental effects on the environment and tourism. Common issues identified included pollution on beaches, improper waste disposal, and increasing waste due to tourism activities. 2. Stakeholder involvement was emphasised with regard to the importance of collaboration among key stakeholders such as local residents, businesses, tourists, and government bodies.
Phase 2	<p>The second phase aimed to pinpoint the critical variables contributing to marine waste generation and identify responsible entities. The findings revealed:</p> <ol style="list-style-type: none"> 1. Participants identified tourism-related activities, inadequate waste management infrastructure, and lack of awareness as the primary factors contributing to marine waste. Seasonal increases in visitors were highlighted as exacerbating the issue. 2. Participants generally agreed that tourists were the most significant contributors to marine waste on Koh Chang, followed by local businesses that often struggle to manage waste effectively. However, some respondents also pointed to insufficient policies and resources from local authorities as a compounding factor.
Phase 3	<p>The final phase delved into actionable policies and strategies to address marine waste issues, with a focus on tourism sustainability. Respondents provided the following insights:</p> <ol style="list-style-type: none"> 1. Government policies and local administration: Participants suggested implementing stricter regulations on waste disposal, improving waste collection infrastructure, and introducing penalties for non-compliance. Policies to promote recycling, reduce single-use plastics, and encourage eco-friendly tourism practices were also emphasised. 2. Many respondents advocated for initiating zero-waste behaviours within their respective roles. Suggestions included conducting awareness campaigns for tourists and residents, adopting waste segregation practices, and promoting sustainable business operations. 3. For long-term sustainability, respondents highlighted the need for a multi-stakeholder approach that balances environmental protection with tourism development. The key recommendations included fostering environmental education, enhancing public-private partnerships, and promoting community-based tourism that prioritises environmental stewardship.

Source: Authors' Elaboration

Data analysis software

Approximately two thousand words were collected during the three sets of semi-structured interviews. NVivo 11 software was utilised to analyse this content in order to identify the frequency of words from all participants, alongside a content analysis technique. The word frequency analysis of NVivo 11 is shown in figure 3.

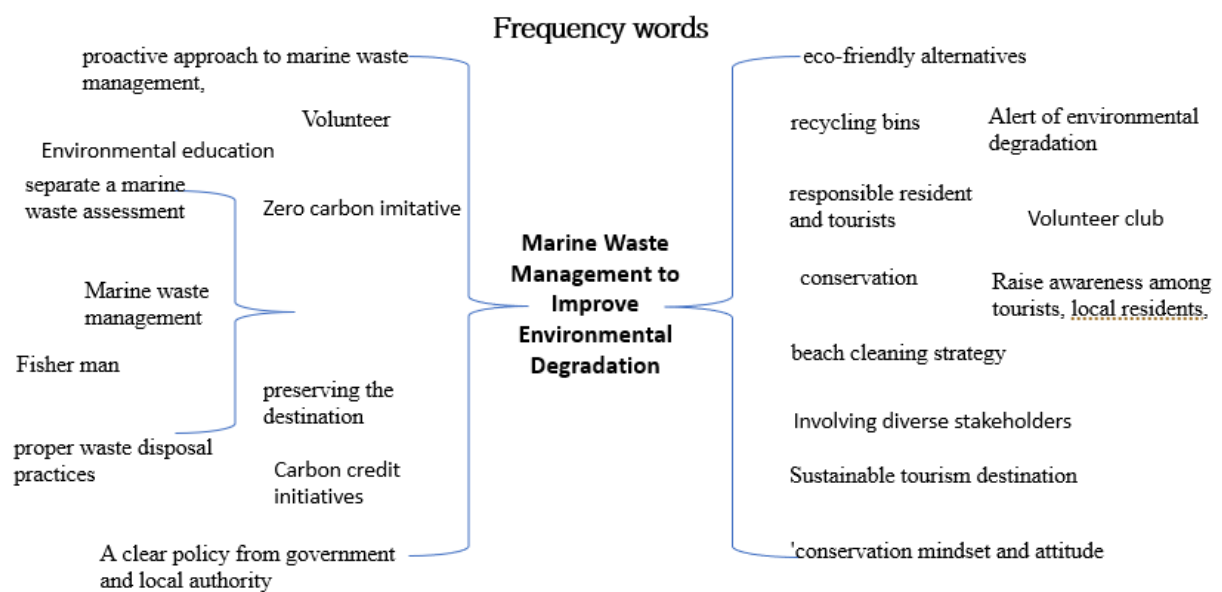


Figure 3: Analysis of high frequency words using NVivo 11 software
Source: Authors' Elaboration

Selective data analysis

To achieve the research objectives, extraction of the results from the semi-structured interviews' three phases was conducted. The data were obtained from the original statement and the connotation results collected throughout the stages of the semi-structured interviews and underwent further analysis with selective coding for identification of the most significant findings related to the study objectives. These findings are summarised in table 3.

Table 3: Selective results from participants

Categories	Connotation statements
Local administrator involvement	As involvement of stakeholders brings together a broad range of groups and individuals directly or indirectly involved in the sustainability of the destination, it fulfils an important role in the maintenance of sustainable tourist destinations, particularly in the public sector, namely the local government administration in this study. By engaging with other stakeholders, efforts will be made to consistently implement practices that are eco-friendly in more comprehensive, effective, and sustainable ways over the long term. Essentially, a crucial component for managing marine waste and improving environmental damage is provided by stakeholder involvement, through which inclusivity, collaboration, and shared responsibility are encouraged. This eventually leads to the implementation of measures that result in more impactful and sustainable benefits for the natural environment of the destination, the local communities, and the tourism industry overall.
Marine waste management	Inadequate waste management infrastructure, combined with insufficient facilities and resources for proper waste disposal and recycling, results in a significant amount of waste ending up in the ocean. The absence of enforcement of regulations concerning waste management further exacerbates this problem. Both residents and businesses often dispose of waste improperly, contributing to the problem. Additionally, fishermen are key contributors to marine waste, frequently throwing items such as plastic, glass, and chemical waste into the ocean during their fishing trips.
Reduction of environmental degradation	Widespread coral bleaching has been found in Koh Chang National Park and on Koh Chang Island in several areas. If left unaddressed, this could cause significant damage to the marine ecosystem, which is also caused by the disposal of marine waste. Additionally, the large number of tourists who come to dive in the area may also have a role in the natural environment's deterioration, making it difficult to manage and restore it to its original condition so as to ensure that the beautiful nature of Koh Chang is not degraded due to the consumption and use of resources by locals and tourists.

Categories	Connotation statements
Policies and effective guidelines	<p>The Office of the Marine and Coastal Resources Department, the Royal Thai Marine Police (Trat), the Trat Tourism Business Association, hotel business operators, community leaders, village headmen, Koh Chang Subdistrict Municipality, and Koh Chang Tai Subdistrict Municipality must collaborate to initiate the Koh Chang Volunteer Development Club and beach cleanup activities. These efforts should aim to reduce beach litter and raise awareness among the community, tourists, tourism operators, shop and restaurant owners, students, and the general public about the importance of addressing marine debris. By fostering cooperation in reducing, managing, and disposing of waste before it reaches the sea, they can make a significant impact.</p> <p>Additionally, the local government, supported by the Thai national government, should implement regulations to legitimise waste management policies, particularly in recycling waste for sale in order to generate supplementary income for the community.</p> <p>Effective guidelines could include tourist activities during their stay, such as creating volunteer opportunities for tourists and giving awards to those who participate in cleaning up the ocean, beaches, and urban areas of Koh Chang Island. Another initiative could be a tree-planting program in which tourists plant trees and have their names displayed on each one, thereby contributing to the island's environmental conservation efforts.</p>

Source: Authors' Elaboration

5. Discussion

The findings of this research highlight the importance of involving the local government administration in managing marine waste at beach tourism destinations such as Koh Chang in Thailand's Trat Province. The aims of the successful conservation of these types of destinations are consistent with the outcomes of multilevel stakeholder management and find support in the previous findings of Freeman (2023), Johnson-Cramer et al. (2017), and Mashali et al. (2023). Their research emphasises that the management of stakeholders is a holistic approach that requires engagement and coordination of a range of stakeholders at various levels to enhance the sustainability of tourism. Public and private sector stakeholders are interconnected and provide mutual benefits. Similarly, Khojastehpour and Shams (2020) and Bridoux and

Stoelhorst (2022) noted that stakeholder involvement is crucial for the maintenance of green tourism destinations as it consolidates a diverse range of individuals and groups having a personal interest in the sustainability of the destination (Surachman, Perwitasari & Suhendra, 2022; Thaler & Levin-Keitel, 2016).

A critical role in mitigating environmental degradation is played by MWM because marine waste contributes significantly to carbon emissions, especially in beach tourism areas with limited transportation options. This perspective is in alignment with extensive previous research on waste and marine waste management (Amasuomo & Baird, 2016; Roy et al., 2023; Chisholm et al., 2021). Effective implementation of MWM requires the participation of both the tourists and the residents who gain benefits from environmental quality and play a major role in contributing to the generation of waste, as this will lead to the creation of synergistic opportunities to address the problem of environmental degradation.

Oka et al. (2022), Jopp (2015), and Grilli et al. (2021) confirmed that solid marine waste management is essential for sustaining tourism destinations. The results of their studies recommend collaborative efforts with the local government administration and centres for recycling to ensure that marine waste is properly handled and processed. The establishment of a regular schedule for the collection of waste and confirmation that disposal methods are environmentally responsible are of vital importance. In addition, providing a sufficient-number of garbage cans in public spaces and locations that are frequented by tourists can facilitate the prevention of littering.

6. Conclusions

Effective measures must be implemented to ensure that the natural beauty of Koh Chang is preserved and not degraded by the consumption and use of resources by locals and tourists. These measures include promoting sustainable practices, enforcing environmental regulations, and raising awareness of the importance of protecting the island's natural environment. Therefore, in order to accomplish the goals of this study, the aims of this research were: 1) to examine the appropriate adoption of social policy of local government administration in managing marine waste; and 2) to evaluate the effectiveness of the guidelines for reducing marine waste to improve environmental conditions for sustainable tourism. Based on the empirical results of the three sets of semi-structured interviews conducted with participants

involved in the local government administration, the conclusions of the study can be summarised as follows.

The primary objective of this study was to investigate and evaluate the effectiveness of the social policies adopted by the local government administrations in managing marine waste. The study identifies the opportunities for collaboration among key stakeholders, tourists, residents, and enterprises (e.g., accommodations, restaurants, and destinations) as crucial to the successful implementation of concrete policy plans. The findings can subsequently be applied to enhance the well-being of local residents and tourists while they reside in or travel around Koh Chang. Furthermore, reducing the need for medical treatment for residents and tourists could minimise government expenditures and optimise the use of economic resources within the area.

Importantly, this study found that fishermen are a key driver of environmental degradation by creating marine waste during fishing trips. Fishing enterprises must therefore address this issue in order to prevent such circumstances from occurring, as confirmed by the study of Bagirova, Blednova and Neshataev (2024). Local governments must implement policies including strict laws to enforce the compliance of these fishing enterprises. Providing proper rubbish bins on ships for fishermen and requiring them to show the waste in these bins upon return can ensure that waste is not disposed of in the ocean.

This study also evaluated the effectiveness of the guidelines for reducing marine waste to improve environmental conditions for sustainable tourism. Activities to develop measures to reduce marine litter in target areas should include the participation of associations, NGOs, schools, and foundations. The collection of marine waste such as foam fragments, plastic debris, floating buoys, shoes, disposable cups, and plastic containers is essential. Local government administration can collaborate with the Marine Resource Conservation Division through its General Administration Section to organise introductory open-water diving training courses. The objective of this training is to enhance the diving skills of volunteers who have not previously received basic diving training and provide them with proper knowledge on coral reef diving. This will enable them to assist in the conservation and restoration of marine resources efficiently. Moreover, this training can be provided to tourists interested in conserving marine resources. Trained divers will be able to effectively assist in the underwater missions of the Department of Marine and Coastal Resources, raise awareness of underwater litter collection, and promote marine environmental conservation. Initially, these trainees can participate in sea cleanup activities.

Local government administration should also implement preliminary surveys to gather information related to the area, occupations, tourism activities, and other activities, as well as to listen to opinions and suggestions regarding the management of marine resources and tourism in the area. The survey should involve various stakeholders, such as the chairperson of the community tourism enterprise group, leaders of the eco-tourism group, local fishermen, eco-tourism operators, boat rental operators who take tourists around the island and conduct sea activities, government agencies, and departmental support. The collected information and needs will be summarised and proposed to the department for consideration when formulating guidelines to promote the community's role in managing tourism alongside resource management. This aligns with the objective of managing these islands through community-based tourism as a model for the management of sustainable island tourism.

6.1. Implications of the research

This study of marine waste management to alleviate environmental degradation for sustainable beach tourism on Koh Chang offers significant academic and practical implications. Academically, it enriches the literature, provides methodological insights, and promotes interdisciplinary research. In terms of practice, it delivers concrete policy recommendations, emphasises community engagement, aids tourism management, advocates for educational programs, supports environmental conservation efforts, and informs future social policy developments. Collectively, these implications will contribute to advancing sustainable tourism practices and environmental management in coastal regions.

6.2. Limitations and recommendations regarding future research

The main limitation of this research was that the scope included only Koh Chang, and thus, it may not be possible to generalise the findings to other tourist destinations. The methodology used semi-structured interviews that do not provide the interactive exchange of ideas from the participants. Acknowledgement of these limitations inherent to focusing on such a specific context is important. In addition, due to practical constraints, the study may not have adequately represented all the relevant stakeholders, meaning that there may be views and perspectives that have not been included in the data collection of this research.

Future research should therefore implement an analysis comparing destinations that are similar so that the common challenges they face and the best practices they employ can be identified, which will provide a broader perspective on the management of sustainable tourism that is more inclusive. Additionally, investigating the roles played by training programs and education in increasing the awareness of sustainable tourism, direct observation, focus group interviews and strengthening the capacity of the stakeholders is recommended for further research. This would help create an understanding of how to better engage various groups in sustainable practices and enhance the overall effectiveness of tourism management strategies.

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Appendix 1

Original statements obtained from the participants through semi-structured interviews

Semi-structured interviews	Original statements
Phase 1	<p style="text-align: center;">1. Are you aware of the situation of marine waste on Koh Chang?</p> <p>“Yes, I am aware of the marine waste situation on Koh Chang. Our office has been actively involved in efforts to address this issue. However, even though we provided the trash bins at the touristic areas, the plastic waste has still been found on the beach. I think effective marine waste management comes through various initiatives and collaborations with other agencies.” – Participant A</p> <p>It affects our community’s livelihoods, especially those dependent on fishing and tourism. Moreover, some children are affected by the left-over marine waste such as glass fragments and get injured. We have been working on community-led clean-up activities and awareness programs.” – Participant B</p> <p>“Yes, the ministry is very much aware of the marine waste situation on Koh Chang because we can observe it almost every day. We have been monitoring the situation and providing support to local administrations to manage and mitigate the waste effectively.” – Participant C</p> <p>It is a significant environmental concern and form of degradation, and we are working on implementing stricter regulations and better waste management practices to tackle this problem.” – Participant D</p> <p>“Yes, I am aware of the marine waste situation. It is a growing issue, and our department is focusing on raising awareness and improving waste disposal and recycling methods to address it.” – Participant E</p> <p style="text-align: center;">2. How does the local government administration as one of the involved stakeholders affect the reduction of marine waste?</p> <p>“By collaborating with local communities, businesses, and environmental activists, we can implement more effective waste management strategies. It also ensures that everyone is committed to maintaining a cleaner environment.” – Participant A</p> <p>“When people are directly engaged, they are more likely to take responsibility and participate in clean-up efforts and waste reduction initiatives. As a result, they experience a sense of accountability and a feeling of ownership.” – Participant B</p> <p>“Stakeholder involvement plays a significant role in reducing marine waste. It allows for a more comprehensive approach, where different perspectives and resources are pooled together. This collaborative effort leads to more sustainable and effective waste management solutions.” – Participant C</p> <p>“Engaging a variety of stakeholders, such as NGOs, government agencies, and the private sector can also help with creating a unified approach and ensures that all parties are working towards a common goal.” – Participant D</p> <p>“Stakeholder involvement is especially important in reducing marine waste. It helps in raising awareness, encouraging community participation, and ensuring that waste management practices are adhered to. When stakeholders are involved, there is a collective effort to tackle the issue more effectively.” – Participant E</p>

Phase 2	<p style="text-align: center;">3. What is the most important factor in the creation of marine waste on Koh Chang in your opinion?</p> <p>“The most important factor in creating marine waste on Koh Chang is the lack of effective waste management infrastructure. Inadequate facilities and resources for proper waste disposal and recycling lead to a significant amount of waste ending up in the ocean. Strict regulation for the enterprises and tourists must be implemented as well.” – Participant A</p> <p>“In my opinion, the most important factor is the behavior and awareness of the local population and tourists. Many people do not understand the impact of their waste on the marine environment, and there is a need for more education and awareness campaigns to address this.” – Participant B</p> <p>“The primary factor is the rapid increase in tourism and related activities. The influx of tourists leads to higher waste generation, and if not managed properly, this waste ends up in the marine environment. Therefore, tourism management and waste management need to be better integrated.” – Participant C</p> <p>“I believe that the main factor is the insufficient enforcement of waste management regulations. Although there are policies in place, the lack of strict enforcement and monitoring allows for improper waste disposal practices to continue, contributing to marine waste.” – Participant D</p> <p>“In my view, improper waste disposal by both the businesses and residents is the major factor. When a large number of people fail to implement proper methods of waste disposal, it can result in substantial amounts of waste entering the sea.” – Participant E</p> <p style="text-align: center;">4. Who is the largest contributor to marine waste on Koh Chang?</p> <p>“Firstly, I believe that the tourists and visitors are the primary contributors to marine waste on Koh Chang; however, the truth is that fishermen from the fishing business are also creating high amounts of marine waste when fishing as they often throw trash, e.g., plastic bottles, plastic bags, glass, etc., into the ocean.” – Participant A</p> <p>“In our community’s view, businesses, particularly those in the tourism and hospitality sectors, make the most significant contribution to marine waste. Their operations result in large quantities of single-use plastics and other waste materials that end up in the ocean.” – Participant B</p> <p>“Moreover, we cannot overlook fishermen who also potentially create marine waste when they are fishing. While tourists generate a substantial amount of waste, local residents also play a role through their daily activities and practices.” – Participant C</p> <p>“In my assessment, commercial activities such as tourism-related businesses, restaurants, hotels, and beach activities, are the major contributors to marine waste on Koh Chang. Their operations, including food and beverage services and recreational activities, generate substantial amounts of waste that impact the marine environment.” – Participant D</p> <p>“Based on our observations, tourists are the primary contributors to marine waste on Koh Chang. The sheer volume of waste generated by tourists, including packaging, plastic bottles, and other disposables, significantly impacts the coastal and marine ecosystems.” – Participant E</p>
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Phase 3	<p>5. What policies should the government or local administration implement in terms of reducing marine waste in island and beach destinations?</p> <p>“The government should focus on improving marine waste management infrastructure and facilities on the island. This includes establishing more recycling centers, implementing stricter marine waste disposal regulations, and conducting regular clean-up campaigns involving enterprises, residents and tourists.” – Participant A</p> <p>“This can involve incentivising businesses to reduce single-use plastics, organising beach clean-up drives, and educating residents and visitors about responsible waste disposal practices.” – Participant B</p> <p>“This includes implementing comprehensive waste collection systems, promoting eco-friendly alternatives to plastic, and collaborating with local communities and businesses to enforce sustainable practices.” – Participant C</p> <p>“This could involve imposing fines for littering, incentivising businesses to adopt eco-friendly practices, and investing in technologies for efficient waste processing.” – Participant D</p> <p>“Local administration should prioritise education and awareness campaigns to change behaviours regarding waste disposal. This includes educating tourists about the environmental impact of their actions, promoting reusable alternatives to single-use plastics, and engaging with local communities to foster a culture of environmental stewardship.” – Participant E</p> <p>6. What are some of the ways you can initiate zero-waste behaviour within the responsibilities of your position?</p> <p>“In my role as Chief Executive, zero-waste behaviour can be initiated through implementation of policies that are focused on recycling and the reduction of waste throughout our administrative office. This includes promoting paperless practices, encouraging staff to use reusable containers and utensils, and collaborating with local businesses to minimise packaging waste.” – Participant A</p> <p>“As the community enterprise’s chairperson, zero-waste behaviour can be initiated through providing an example of this type of behaviour within our enterprise to other members of the community. This involves implementing recycling programs, organising workshops on composting and sustainable living, and partnering with local schools and residents to promote eco-friendly practices.” – Participant B</p> <p>“As part of the Ministry, I can initiate zero-waste behaviour by advocating for comprehensive waste management policies and programs at the municipal level. This includes supporting initiatives for waste segregation, establishing recycling facilities, and conducting awareness campaigns to educate residents on reducing waste generation.” – Participant C</p> <p>“In my capacity as a Senior Officer, I can initiate zero-waste behaviour by integrating environmental sustainability into our department’s operations. This includes conducting waste audits, implementing procurement policies that prioritise eco-friendly products, and promoting initiatives to reduce paper and plastic use.” – Participant D</p> <p>“This includes organising office-wide recycling programs, advocating for reusable alternatives in office supplies, and participating in community clean-up events to promote environmental stewardship.” – Participant E</p>
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7. Out of all these activities of marine waste management for reducing environmental degradation, what is your suggestion for tourism sustainability?

“My suggestion is to establish a community-based recycling center in partnership with local businesses and NGOs. This center would not only serve as a collection point for recyclables but also provide educational programs on waste management and sustainability to residents. Whatever policies or guidelines we intend to implement, it must be ensured that they contribute to the improvement of the social well-being of residents, and that tourists and beach tourism remain a key driver of the economy on Koh Chang island.” – Participant A

“I suggest creating a green procurement policy for our community enterprise, because by sourcing eco-friendly products and materials, we can reduce our environmental footprint and set an example for other businesses in the area to follow. Also, organising the Volunteer Development Club on Koh Chang would be great initiative to get involved with residents and tourists, but it must be implemented by the private sector in a way that is similar to government administration.” – Participant B

“This would incentivise residents to reduce their waste generation and properly sort recyclables, leading to more efficient waste management practices and cost savings for the municipality.” – Participant C

“I propose launching a public awareness campaign on the importance of reducing single-use plastics. This campaign would target both residents and tourists by promoting reusable alternatives and highlighting the environmental impacts of plastic pollution on marine ecosystems.” – Participant D

“My suggestion is to collaborate with local schools to integrate environmental education into the curriculum. Through educating students about waste reduction, recycling, and sustainable practices from a young age, we can cultivate a generation of environmentally conscious citizens. That will be good for social well-being.” – Participant E