

Sustainable Resilient Design Challenges for Ecotourism Education in Setiu Wetland

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Abstract

In Terengganu, Malaysia, the Setiu Wetland is a protected area that is a great place to learn about the environment. There is a lot of potential for ecotourism here. One of the most effective ways to reduce harmful impacts on the environment is to offer ecotourism education at tourist spots. To protect the natural ecosystem and the cultural history of the nearby communities, wetland environmental education centres in this ecologically sensitive area must be carefully planned. This is because there are several things that need to be considered. But the lack of new and modern tourist facilities has made it hard for coastal wetland destinations to grow as tourist destinations. Both the lack of physical growth of wetland facilities and the lack of clear national policies and standards to regulate these facilities have been blamed for the drop in the number of tourists who visit wetlands. A serious problem is getting worse. Setiu Wetland needs to find out if there are any problems with the technological and architectural parts of the sites for ecotourism educational experiences. This study wants to find out if there are any gaps in the physical facility designs for ecotourism educational experiences in the Setiu Wetland so that they can be filled. This study used three methods: in-depth interviews, online and in-person observations, and planning papers. Observations by participants are also a way that data are collected. By talking to partners and authorities in depth, the information was better. Setiu Wetland's environmental education buildings need to be designed with environmental sensitivity, accessibility, cultural sensitivity, and long-term sustainability in mind. By working closely with regional stakeholders and local communities, it is possible to build facilities that are good for the environment, protect cultural history, and give visitors an interesting and educational experience.

Keywords: Ecotourism, Environment Education, Facilities, Sustainable Resilience, Setiu Wetland

Introduction**The Current Scenario for the Setiu Wetland**

The Setiu Wetland, located on the eastern coast of Peninsular Malaysia, plays a vital role as an ecosystem that provides various advantages to both the natural environment and human society. Mangroves, peat swamps, and coastal ecosystems are essential constituents of this various ecological system. The wetland ecosystem encompasses a wide range of plant and animal species, many of which are at risk of becoming endangered or extinct.

Nevertheless, the Setiu Wetland is currently facing various environmental factors that pose a potential threat to its long-term sustainability. The issue at hand is a complex one, encompassing various factors such as pollution, overfishing, deforestation, and climate change. Environmental education that places significant emphasis on the significance of eco-friendly building practises and operations is imperative to identify and implement effective solutions to these pressing environmental challenges. This article examines the significance of environmental education in advancing sustainability and the challenges associated with constructing eco-friendly infrastructure within Setiu Wetland. The architectural design of facilities played a significant role in determining a country's capacity to integrate technology into educational experiences for tourists during the COVID-19 pandemic. The unforeseen requirement will have an impact on the spatial arrangement and architectural design of your building. The existing infrastructure for programmes and activities in the Malaysian Coastal Wetland exhibits a reduced emphasis on tourism. However, it is important to note that the association with acquiring knowledge from nature is frequently more social than purely intellectual. Despite their significant role in providing comprehensive educational experiences and supporting the natural environment, the physical design characteristics of numerous public wetlands have failed to generate sufficient interest in their long-term preservation and intended functions.

Wetland ecosystems offer a wide range of benefits, including but not limited to water provision, food production, construction resources, transportation facilitation, coastal defence, and recreational opportunities (Tapper, 2012). Tourists have the potential to contribute to the preservation of tourist locations in the long term through the adoption of ecologically responsible behaviour, provided they are adequately informed about the detrimental impact their actions can have on the environment (Puhakka, 2011). According to Ahmad et al (2016), the park's product encompasses a comprehensive range of amenities, programmes, and services offered within the park. The exponential expansion of corroborating evidence indicates that interaction with natural environments exerts a substantial influence on human behaviour (Franco et al., 2017).

Sustainable Resilience in Setiu Wetland

In the case of Setiu Wetland, the idea of sustainable resilience refers to the wetland ecosystem's ability to withstand and adapt to environmental stresses and changes while keeping its ecological, social, and economic functions for a long time. A study by Cellani et al (2018) suggests that marine spatial planning (MSP) could be used to manage the Setiu Wetland. The issue of conflicting coastal uses is addressed through the implementation of strategies prioritising environmental sustainability. In the study, a quantitative survey was used to find out how much the local people understood about the importance of the Setiu Wetland ecosystem and how it affected social and economic activities. Research shows that people in the area know how important oyster habitats are in wetland ecosystems. In order

to protect the health of the environment, the community works hard to keep wetlands around.

In the study by Lawson et al (2020), the idea of "resilience" is used in the context of designing landscapes for urban wetland parks. The authors look at how resilient landscapes can be used to deal with urban flood disasters, get the "sponge function," improve the ecological balance in a region, and support sustainable development.

In a recent study conducted by Della et al (2021), the researchers investigated the influence of culture on individuals' capacity to sustain their livelihoods within the floodplain wetland fisheries of rural Indonesia. The present study employed the sustainable livelihoods approach (SLA) to examine the impact of environmental changes on the fishing industry in South Kalimantan, Indonesia. The findings of the study indicate that the fishing industry experienced negative impacts because of both environmental changes and human activities. The implementation of extensive development initiatives has significantly exacerbated the challenges faced by fishermen, thereby increasing their susceptibility to adversities and economic hardships. The findings indicate that cultural factors have an impact on an individual's capacity to cope with and overcome challenges that impact their lifestyle.

Setiu Wetland management necessitates a long-term and resilient approach that balances wetland ecosystem conservation and restoration with local community needs and aspirations. This article is more concerned with promoting ecotourism and sustainable tourism initiatives that benefit local communities while also increasing environmental awareness and education. It will touch on the concepts of environmental, economic, and social sustainability.

RO1: The main objective to find a solution and build the indicator is to identify the gaps in Setiu Wetlands' physical design.

Literature Review

Sustainable Wetland Challenges in Malaysia

Malaysian wetlands face many dangers to their long-term sustainability. Land usage, pollution, and climate change are examples. These issues affect wetland ecosystem preservation and management nationwide.

In order to determine the viability of implementing marine spatial planning (MSP), Aziz et al (2021) examined Setiu Wetland, a diverse wetland on Peninsular Malaysia's eastern coast. The study emphasised the community's comprehension of the ecological significance of Setiu Wetland and its influence on socio-economic endeavours. According to the findings of the study, it can be inferred that the local community exhibits a level of awareness of the significance of oyster habitats within wetland ecosystems. In addition, the neighbourhood actively promotes the protection of wetlands.

A separate study by Rahman et al (2023) examined Setiu Wetland mangrove species diversity and assemblage. The wetland research found 20 mangrove species, 11 genera, and nine families. Mangroves in wetland environments are vital habitats for breeding, nesting, and species nursery. The International Union for the Conservation of Nature (IUCN) classed some mangrove species as vulnerable, highlighting the need for conservation efforts.

Malaysian wetland management faces many challenges, including limited resources and funding, poor interagency cooperation, insufficient public awareness and education, and legal

and legislative gaps (Aziz et al., 2021). The study stressed the importance of managing wetlands holistically, considering their ecological, social, and economic aspects. According to Alipiah et al (2020), examined Setiu Wetland tourist management possibilities. The study highlighted the wetland's diverse ecosystems and fauna. The study stressed sustainable tourism practises and the economic benefits of ecotourism in the wetland area. Malaysia's National Ecotourism Plan suggests ecotourism at Setiu Wetland. The literature review examines Malaysia's wetlands management issues and remedies. This involves land-use changes, pollution, resource scarcity, and outdated laws. Managing wetlands must be broad and coordinated to meet these concerns. This method should incorporate public awareness, government partnerships, and sustainable tourism and fisheries.

Facilities Management in Setiu Wetland

There is a lack of literature pertaining to resource management in Setiu Wetland. In the preceding year, research conducted by Lani et al (2018) examined the physical and chemical characteristics of several water sources inside the Setiu Wetland. The objective of the research was to investigate the physicochemical characteristics and chemical composition of water resources in Setiu Wetland and examine their impact on the local water resources. The findings of this research have the potential to enhance the approaches to management used in the marsh ecosystem, particularly with regard to water quality monitoring and control. Ibrahim and Aminudin (2012), did a review of wetland management in Malaysia and found a number of problems. These included limited resources and funding, a lack of coordination between government agencies, a lack of public awareness and education, and a lack of legal and policy frameworks. These problems can also make it hard to handle the facilities in Setiu Wetland. To deal with these problems, wetland management needs to be more comprehensive and integrated. This means raising knowledge, improving coordination between government agencies, and putting in place sustainable practises in areas like tourism and fishing.

Further research is warranted to enhance the understanding of facilities management in the context of Setiu Wetland, with the aim of ensuring the long-term sustainability of the wetland and its associated ecosystems. This can be achieved through vigilant monitoring and regulation of water quality, effective waste management practises, and the implementation of environmentally conscious infrastructure development strategies aimed at minimising adverse environmental impacts. Effective facility management plays a crucial role in safeguarding the ecosystems of Setiu Wetland over an extended period and facilitating sustainable development within the region.

Sustainable Tourism Development in Setiu Wetland

The Setiu Wetland is an indigenous wetland located in the region of Terengganu, situated in Peninsular Malaysia, in close proximity to the East Coast. The nine interconnected wetland habitats, including the sea, beach, mudflat, lagoon, estuary, river, islands, coastal forest, and mangrove forest, have gained significant renown. The wetland harbours a variety of invasive and endangered species, including sea turtles, painted terrapins, estuary crocodiles, fireflies, and huge freshwater prawns. The distinctive flora and animals found in Setiu Wetland have the potential to appeal to ecotourists. The wetland provides opportunities for nature-based ecotourism, with scenic vistas of the lagoon, river, and estuary, as well as mangrove and coastal forests, swamp woods, beaches, and indigenous fishing settlements.

Ecotourism encompasses a range of activities that contribute to the preservation and appreciation of natural environments. These activities may include engaging in recreational fishing, embarking on river and lagoon cruises, partaking in mangrove forest tracking, and observing migrating birds, fireflies, terrapins, and turtles. Alipiah et al (2020) posit that the implementation of sustainable tourism practices in Setiu Wetland helps to safeguard ecological integrity, conserve the region's inherent natural and cultural assets, and foster socio-economic benefits for the local community. Sustainable tourism development encompasses the integration of environmental, social, and economic issues in order to achieve long-term sustainability.

The main finding by Ismail & Said (2015) in the article is that sustainable tourism development in Setiu Wetlands faces several challenges, including a lack of coordination among stakeholders, inadequate infrastructure, insufficient waste management, and a lack of environmental awareness among tourists. The authors, on the other hand, propose several strategies for promoting sustainable tourism, such as improving infrastructure and facilities, promoting eco-tourism and responsible tourism practices, developing community-based tourism initiatives, and providing environmental education programs. The authors stress the importance of stakeholder participation and effective collaboration in promoting sustainable tourism development in the Setiu Wetlands. Overall, the article discusses the opportunities and challenges of developing sustainable tourism in the Setiu Wetlands, as well as several strategies for promoting sustainable tourism in the region.

According to Aziz et al (2021), sustainable tourism development in Setiu Wetland would require protecting and preserving the mangrove forests, coastal woods, and lagoons.

Development Plan: Effective management plans, such as marine spatial planning, can regulate conflicting uses and maintain ecological health.

Community empowerment: Sustainable tourism depends on local communities. Wetland ecosystem awareness and comprehension are crucial. Engaging the local population in decision-making, providing training and capacity-building, and ensuring they benefit economically from tourism can increase their support for conservation efforts.

Responsible tourism: Sustainable tourist development in Setiu Wetland should promote responsible tourism practises, including minimising waste, conserving water, and energy, supporting local companies and goods, and honouring local culture and customs. This reduces tourism's environmental impact and improves the local community.

Monitoring and evaluation: Setiu Wetland tourism operations must be monitored and assessed in accordance with sustainable development objectives. The environmental impacts, visitor behaviour, and economic and social benefits of tourism can be evaluated. Management and strategy can be guided by monitoring and evaluation.

In conclusion, the sustainable tourism development of Setiu Wetland strikes a balance between wetland ecological conservation, local community empowerment, and the economic benefits of tourism. Setiu Wetland can serve as a model for sustainable tourism development by incorporating all stakeholders and implementing responsible tourism practices.

Method

The present study employed qualitative research methods, including in-depth interviews and on-site observations. The observation of the Setiu Wetland has yielded significant insights

regarding the strengths and limitations associated with facility planning. Undoubtedly, the establishment of physical infrastructure and amenities in coastal wetlands entails intricate and costly processes, necessitating the assurance of their calibre and adherence to global benchmarks.

The initial phase of data collection will entail conducting on-site observations and conducting in-depth interviews with the guidance and support of the gatekeeper to gather empirical evidence. This study employed various data collection methods, including the use of photographs, videos, voice recordings, and mapping techniques. The comprehensive documentation of the physical design of the facilities offered in Setiu Wetland will encompass a SWOT analysis, descriptive accounts, and interpretations of observations made by both a fellow participant and the researcher.

The collection of this data will contribute to the research objective of identifying the existing deficiency in physical design facilities within the Setiu Wetland area. According to Creswell (1998) assertion, qualitative research is a systematic approach rooted in a well-defined methodological framework that explores social or human issues. In this context, researcher endeavours to construct a comprehensive and nuanced understanding by analysing verbal expressions, presenting in-depth perspectives, and conducting the study within an authentic environment.

The methods used for collecting data are undergoing continuous development, with a growing emphasis on the active engagement of participants and a heightened awareness of the ethical considerations surrounding the individuals involved in the study. Consequently, the research methodology included the use of on-site observation as a means of collecting empirical data, which was further complemented by conducting interviews to acquire further information and provide clarification.

There are three primary approaches for gathering data in case study research: focus groups, site observation, and in-depth interviews with subject matter specialists. This study presents a case analysis conducted in Setiu Wetland, focusing on site visit observations pertaining to the physical attributes of facilities that enhance educational experiences within the tourist environment. One of the research objectives is to ascertain the existing research gaps pertaining to the physical design facilities in Setiu Wetland.

The use of a case study approach enhances the clarity of the problem under investigation. In the context of data collection, direct observation refers to the act of gathering information through the involvement of an external observer, commonly referred to as a non-participant observer, or a participant observer, who assumes the role of a staff member while carrying out regular duties and simultaneously observing the processes.

Site Observation

Observation, specifically participant observation, has been employed in various academic disciplines as a means of gathering data pertaining to individuals, phenomena, and societies (Kawulich, 2005). Through a comprehensive examination of the Setiu Wetland design, an analysis is conducted on the distinctive features of the constructed and natural surroundings, encompassing both the physical and social dimensions of the Coastal Wetland case studies. Physical assets refer to the specific attributes that a building or facility must possess to attract users and enhance utilisation, thereby facilitating the attainment of predetermined objectives for which they are established (Musa et al., 2012).

Structured protocols, encompassing tools such as checklists or rating scales, can serve as a supplementary or substitute method. Photographs or video images constitute an additional

form of data that is gathered. The act of observing the Setiu Wetland offers a valuable opportunity to gain insights into the identification of both strengths and weaknesses in planning through the application of SWOT Analysis. The inclusion of this information will be incorporated into the data collection description.

The plans have been developed to map the physical elements of the facilities design in Setiu Wetland. Within the framework of the planning documentation, the components encompassed zoning regulations, spatial allocation for constructed areas, and the identification of significant architectural landmarks. The inclusion of a physical element inventory is an integral component of the site analysis process. Undoubtedly, the process of developing physical assets and facilities in coastal wetland areas is intricate and entails significant expenses. Consequently, it is imperative to prioritise the assurance of their quality.

In-Depth Interview

The process of conducting interviews with the gatekeeper, local community, and authority appears to lack a systematic and carefully organised approach. The findings of a qualitative investigation highlight various dimensions. As the individual engaged in inquiry acquires knowledge regarding the appropriate questions to pose and suitable individuals to direct those inquiries to, the research inquiries may undergo modifications and become more precise. Consequently, the data was gathered underwent confirmation, cross-validation, and substantiation (Cresswell, 2003). Consequently, a series of comprehensive interviews were undertaken, wherein the interview questions were formulated based on the analysis of secondary data. The findings from the online data collection and face-to-face interview conducted with Mr. Muhamad Allim Jamalludin, the president of Wetland School of Setiu (WSS), were analysed using coding techniques. This analysis revealed a number of recurring themes that primarily revolved around the school's facilities and the tourist attractions it offers. This will enable us to discern obstacles and potential remedies for enhancing organic educational experiences via the design and planning of facilities.

The data utilised in this study was gathered during a field excursion that took place on 8th May, 2022. In addition to addressing the research questions, in-depth interviews and observations have the potential to yield sufficient data. The document provides details regarding the amenities and tourist points of interest found within the Setiu Wetland area. The analysis of data obtained from the SWOT survey, conducted among individuals who had previously visited Setiu Wetland, was undertaken to gain a deeper understanding of the various amenities and recreational options offered at Setiu Wetland.

Result and Discussion

Site inspections were conducted on May 8, 2022, with the purpose of evaluating the land management and utilisation practices implemented by the landowners who were questioned on their individual holdings. The site inspections were conducted quickly following the interview. As a result, the site visits yielded two separate types of data: participant-generated data, which consisted of discussions, and researcher-generated data, which included mapping information, images, and observations. Participant observation is a research methodology of considerable value that may be used to examine issues that have previously undergone thorough investigation. Moreover, it has the capacity to be used within the framework of a SWOT analysis.

Site Observation and Participant Observation

On May 8, 2022, a site visit observation of Setiu Wetland (SW) was conducted as part of the ongoing process to collect additional information and enhance data collection using the SWOT analysis method. The data collection for this study consisted of field notes and participant observations, which are documented in Table 1 and Table 2, respectively.

Participant observation is widely acknowledged as a fundamental research methodology in diverse academic fields due to its effectiveness in producing studies that provide a precise depiction of a particular culture. The process of establishing data saturation was conducted by using observations from a sample comprising five people and applying the data collected by the researcher, as seen in Table 2.

Table 1

Site Visit Observation on 8th May 2022

Item	Images	Field Notes
Wetland School of Setiu		<ul style="list-style-type: none"> - educational wetland facility -no originality - traditional educational method
Open Area		<ul style="list-style-type: none"> - Many unused areas are wasted - There is a lack of food and refreshment outlets - Abandoned buildings - Space for tourist attractions is wasted
Terrapuri Resort		<ul style="list-style-type: none"> - price extremely high - cultural retreat - serene area - restricted location

Notable similarities in various aspects of the area, including its condition, job prospects, and the presence of numerous tourism attractions, such as locally crafted handicrafts that contribute to the local economy, have been observed by the researcher and another participant. Furthermore, the region provides a variety of adequately equipped amenities and educational points of interest, alongside its proximity to the beach. To augment the data obtained from field notes and SWOT analysis, a thorough interview was undertaken, complemented by observations and participant observation.

Table 2

A SWOT analysis based on the observations of the participants.

Participant	Strength	Weakness	Opportunities	Treats
A	Wide Coastline	Accessibility	Commercial Coastal Area	Flood
B	It has a beach that brings people there.	No bus facilities	Job Opportunities	Irregular roads
C	Nice view of the beach	Less Attraction for visitor to come. Only one Resort (Terrapuri)	More stalls can be open along the beach for more attraction	Flood
D	Tourism activities in nature Nice view of beach Homestay & Resort	Abandon building The lost attraction for the visitors to revisit	Economic increase Job opportunities	Flood
E	Many green sights for tourists	Less information about the area/landmark	Handicraft Local economic increase	Flood

In-Depth Interview

During the site visit, a noteworthy discussion happened between Mr. Allim, who represented Setiu Wetland, and the proprietor of the Wetland School. The findings illustrated in Table 3 provide clear evidence that the dialogue in question was successfully concluded, transcribed, and subsequently subjected to coding procedures in alignment with the interviewee's statements. The response offered by the proprietor encompasses both the comprehensive nature of the observation and the SWOT analysis conducted by the other participant. This will enable individuals to generate ideas for the future

Table 3

In-Depth interview during Site Observation on 8th May 2022

Question	Potential (Coding)
<i>Could you give a brief explanation of the programmes that you oversee at this school so that I can obtain a better understanding of the Wetland School of Setiu?</i>	<i>Site Information</i>
Response	Potential (Coding)
Briefly, I can explain that there are several tourism potentials in Setiu Wetland that have been mapped between Terengganu and Kelantan. Initiatives by NGOs include Rumah Tok and the Wetland School of Setiu. As a result of the mapping, 20 Natural and cultural treasures can be commercialised. Along the boat route in the Setiu lagoon,	-High tourism potential (tourism, education, agriculture, etc.) -NGO involvement

there are places for harvesting Lokan, Kerang, and many more. In addition, we also have handicraft products, a cottage industry for the local community. There are also projects that we do to convert tourists to handicrafts instead of tourists buying them; we want them to learn how to make their own handicrafts to indirectly generate local income for the community. It also involves sustainability. We focus too much on the product, and we will use a lot of resources. Sometimes what people want is not the stuff very much but the skills; that's what's expensive. Setiu Wetland is still useful, and people are still producing traditional products.

-20 natural and cultural treasure (nature environment attraction)

-Local community income (job opportunities)

-Handicraft (income for local community)

Question

Potential (Coding)

Do you have any data on the volume of visits over the previous five years?

Demographic

Response

Potential (Coding)

I'm sorry, but we do not have any information about visitors over the past five years. We can later monitor it using our email. For future action, we can make the data accessible to investigate the total number of visitors who visit each year.

No demographic data

Question

Potential (Coding)

Who are the individuals or groups that are actively engaged in the management and conservation of Setiu Wetland?

Stakeholder

Response

Potential (Coding)

There is participation from NGOs, authorities, the local community, and those working in the tourism industry (minute meeting with a list of those in charge).

The Setiu District Council Report, Malaysia Plan, Setiu Wetland State Park, and MCMC in the technology section are just a few of the sources that support the SWOT analysis and coding from the interview session until data saturation. One of the paramount attributes of public facilities lies in their capacity to facilitate the equitable distribution of benefits among a substantial population. This pertains to the attraction of visitors with the intention of fostering their subsequent visits. According to the report published by the Setiu District Council in 2015, a comprehensive analysis has been conducted to identify various issues, problems, and prospects pertaining to the study area of Setiu. The Setiu district spans a total area of 74,034.45 hectares, which corresponds to approximately 54.5 percent of land that is deemed environmentally sensitive. The geographical region in question encompasses inundated fields, marshlands, coastal wetlands, swamplands, and lagoon areas within the vicinity of Setiu. Regions with low population density and a reliance on traditional agricultural practises often experience limited job prospects and lower economic returns. The pace of urban development is notably sluggish, leading to a dearth of service variety in metropolitan regions. Urban development is hampered as a result, especially in terms of corporate growth, the provision of public facilities and infrastructure, and the effectiveness of public transit services.

The 11th Malaysia Plan places significant emphasis on green growth, signifying a notable departure from the conventional development approach of prioritising economic growth before addressing environmental concerns. Instead, the plan adopts a perspective that

prioritises sustainable development, low carbon emissions, efficient resource utilisation, and socially inclusive investment strategies. In its pursuit of green growth, it demonstrates perseverance and resilience. The subsequent phase after the 12th Malaysia Plan will entail the implementation of collaborative endeavours aimed at fostering shared prosperity across three key domains: economic empowerment, environmental sustainability, and social re-engineering. Consequently, the focal point will be directed towards the dimension of environmental sustainability, encompassing various aspects such as the blue economy, green technology, renewable energy, and measures pertaining to climate change adaptation and mitigation.

The Setiu Wetland has been officially designated as the Setiu Wetland State Park of Terengganu Darul Iman. According to the articulated vision, the objective is to establish a worldwide exemplar for the preservation of biodiversity and the promotion of sustainable ecotourism. Additionally, it is associated with the objective of conserving biodiversity to promote the well-being of present and future populations. The objectives encompass the preservation and safeguarding of plant and animal life, as well as significant geological formations, ancient scientific artefacts, historical relics, ethnographic materials, and other scientific and visually appealing aspects. Additionally, the aims involve promoting educational and health advancements, enhancing aesthetic value, eliciting public response, and guaranteeing the functionality of the flora and fauna habitat as a catchment area to sustain the ecosystem. Therefore, in order to effectively realise the vision, mission, and goals of Setiu Wetland State Park Management Terengganu, it is imperative to undertake an additional measure.

An issue that has emerged in the Setiu Wetlands pertains to the decline in the appeal of tourist destination amenities. The Setiu Wetland exhibits a deficiency in tourist facilities, which hampers its appeal as a tourism destination. The issue was underscored in the report by the Setiu District Council. This region exhibits diurnal activity patterns, being active during daylight hours and assuming a state of rest during the night. When a particular location or park does not possess sufficient attractions, its level of visitation tends to decline (Ahmad et al., 2016). The examination of tourist demand and its correlation with the environment can shed light on the difficulties and consequences faced by tourism development in Malaysia. This analysis is based on existing literature and involves the assessment of weather conditions and tourist preferences for various attractions (Asbollah et al., 2017).

The availability of wetland facilities is limited, and their development is progressing at a sluggish pace. The physical development of Setiu Wetland Based on the findings presented in the Setiu District Council Report, it is evident that the progress of municipal development has been sluggish and confined primarily to the areas of Bandar Permaisuri, Sungai Tong, and Putera Jaya. Wetland tourism encounters various overarching challenges, including the adverse effects on wetlands resulting from the presence and functioning of tourism establishments. These effects encompass the degradation of wetland areas due to the extraction of building materials, the development of infrastructure, the excessive withdrawal of water resources, and the inadequate management of waste disposal. These challenges arise from the direct impact of tourists on wetland ecosystems. To appeal to visitors who are intrinsically motivated, it is advisable for destination planners and managers in nature-based settings to incorporate enriching amenities, including information boards, guided activities, and relaxation areas (Chow et al., 2019).

Moreover, the absence of cutting-edge tourism offerings and the consequent inadequacy of modern amenities often lead to diminished allure, thereby contributing to a decline in tourist

influx to the wetland area. The current state of facilities at the Wetland School of Setiu indicates that many of them remain in their original condition, with limited awareness among tourists regarding this matter. The limited availability of financial and human resources significantly influences the allocation of capital investment and the development of infrastructure for ecotourism (Ahmad et al., 2016). Consequently, it is imperative to modify technology in accordance with the circumstances faced by the younger demographic.

Furthermore, a notable deficiency exists in terms of well-defined policies or guidelines pertaining to national development. The degradation and destruction of coastal wetlands can be attributed to the unsustainable increase in resource overcollection. Malaysia lacks comprehensive legislation that specifically addresses the safeguarding and administration of biodiversity, with a particular focus on wetland ecosystems. Numerous regulations exhibit specificity for particular industries (Irin et al., 2012). There is a lack of regulation on the pitch. There is a policy proposal that has been formulated, but it has not been put into effect as of yet.

Tourists' nature-based educational experiences facilitated by tourism facilities play a crucial role in mitigating detrimental effects on the surrounding environment. The declining popularity of coastal wetland tourist destinations, however, has hampered the effectiveness of these experiences. This decline can be attributed to the negative consequences stemming from the absence of innovative and high-quality tourism products as well as the inadequate physical development of wetland facilities. Furthermore, the lack of well-defined policies exacerbates this contentious issue.

The architectural design and choice of materials in the tourist region were developed to explore the correlation between architectural design and environmental preservation in tourist destinations as well as to understand the sustainable development of the tourism industry (Meng, 2019). To tackle these challenges, the architectural style within the tourism sector is continuously undergoing transformation. The calibre of a tourist city's numerous established tourism products and services has a significant impact on its operation. In particular, the standard of the buildings within the city has a significant impact on this operation. Architectural architecture, in this context, plays a crucial role in the development of tourist attractions (Li et al., 2013). Unfortunately, we lack any available data pertaining to visitors within the previous five-year period. The email can be subsequently monitored. To facilitate future decision-making, it is imperative to ensure the accessibility of data, thereby enabling a comprehensive examination of the yearly increase in tourists.

Conclusion

During the COVID-19 pandemic, the architectural layout of a nation's establishments emerged as a prominent determinant in the nation's inclination towards incorporating technology into educational experiences centred around tourist attractions. There is now a newly established mandate to conduct an evaluation of facility design, planning, and layout. The existing design of facilities for programmes and activities in the Malaysian Coastal Wetland within the tourism sector is deemed insufficient. Conversely, the connection between nature and educational experiences often manifests at an interpersonal level rather than solely within the realm of formal education.

Many public wetlands haven't been able to keep their appeal and importance as important parts of the natural environment for full educational experiences because of how they look. The main objective of this study is to develop a comprehensive physical design framework for coastal wetland that is specifically tailored to enhance nature-based educational experiences

for tourists. A comprehensive interview was conducted with one participant to explore their perspectives on the primary functioning of the facilities offered and the associated activities. Subsequently, an examination of the physical characteristics of zoning and building structures that enhance educational experiences related to nature tourism is conducted, accompanied by an additional participant's observation in the form of a SWOT analysis. The anticipated outcome entails the development of a benchmark design strategy framework for Coastal Wetland facilities, which will serve to identify the specific facilities that require enhancements. This study will provide valuable support to the Malaysian Ministry of Education and Tourism in their efforts to promote the Coastal Wetlands as a prominent international educational and highly skilled labour destination. Consequently, this initiative will contribute to the enhancement of the local community, economy, and tourism industry. The Setiu Wetland is an exceptional wetland that necessitates thorough planning, development, and management. The incorporation of technology into facility planning within the Setiu Wetland context facilitates enhanced exploration among young individuals. The engagement in handicrafts holds the capacity to make a positive impact on the economic well-being of local communities. The attainment of favourable outcomes relies on the proficient utilisation of potential advantages and the effective management of rural resources by rural communities (Siow et al., 2012). Therefore, it is crucial to advocate for research and design methodologies that effectively engage key stakeholders. The scope of this study involves examining the educational components of nature-based tourism experiences, assessing the current state of coastal wetland facilities, and soliciting expert opinions to devise strategies that can improve visitor experiences by incorporating digital technologies.

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The investigation into sustainable resilience in the Setiu Wetland has been made possible by the assistance and support of numerous individuals and organisations. The purpose of this study is to contribute to the sustainable management and conservation of the wetland in order to provide environmental benefits and enhance the wellbeing of the local population. The results and recommendations will have positive effects on both the wetland ecosystem and its resident species. The expression of gratitude is extended to the local authorities and government agencies, local residents and employees, experts and researchers, tourists who participated in surveys and interviews, family, friends, and coworkers for their unwavering support and encouragement.

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