

ANALYSIS MANAGEMENT OF THE MUSEUM PUSAKA NIAS IN CULTURAL CONSERVATION, BIODIVERSITY, AND SUSTAINABLE HERBAL KNOWLEDGE

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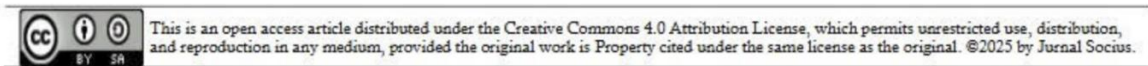
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ABSTRACT: This research aims to analyze the management of the Museum Pusaka Nias in the sustainable conservation of culture, biodiversity, and herbal knowledge. The research methodology used is a descriptive qualitative approach with data analysis using SWOT. The results of the analysis show that the main strengths of the Museum Pusaka Nias lie in its collection of authentic, high-value artifacts, cultural legitimacy, indigenous community networks, and education and conservation of various endemic biodiversity owned by the Nias community. The weaknesses of the Museum Pusaka Nias include ticket prices/donations for tourists from outside the region and limited digital infrastructure that is not yet adequate. For opportunities, the Museum Pusaka Nias has considerable opportunities including increasing cultural tourism trends, academic and government partnerships. Meanwhile, threats lie in tectonic natural disasters, coastal abrasion/degradation of coastal ecosystems and degradation of physical collections. As a solution to overcome these, the Museum Pusaka Nias must be able to adapt to current developments such as technological improvements, the development of thematic tour packages, disaster preparedness and collection risk management, multi-stakeholder partnerships and strengthening human resource capacity.

Keywords: Museum Pusaka Nias, Biodiversity, Herbal Knowledge, SDGs

1. INTRODUCTION

Nias Island, located in North Sumatra, boasts a rich culture, diversity, and unique ways of thinking about managing natural resources, including herbal plants. Nias Island itself possesses unique characteristics, including language, culture, and other characteristics that distinguish it from other communities in North Sumatra. Nias Island identifies itself as "Ono Niha," meaning "Son of Man," or someone endowed with reason and intellect. Ono Niha produces a unique and diverse culture, crafts, and a house-building process that requires only a bundle of rope and no nails [1].

Museum Pusaka Nias is one of the Yayasan Pusaka Nias (YPN) founded by Johannes Hammerle, a monk, in reconstructing cultural values, conserving endemic flora and fauna, and also preserving the values and culture and herbal knowledge that exist on Nias Island [2]. According to [3], a museum is defined as a non-profit,

permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment. Thus, a museum is an institution that strives to represent the natural and cultural diversity of humanity, playing an important role in the protection, preservation and transmission of heritage.

In its management, the Musuem Pusaka Nias undertakes various efforts to preserve and conserve all forms of heritage owned by the Nias society. The primary goal of establishing the Museum Pusaka Nias is to preserve cultural artifacts and transmit local knowledge, including traditional healing practices utilizing the flora of Nias Islands [4]. In its management, Museum Pusaka Nias applies the concept of ecotourism, namely the management of areas that have abundant resources by prioritizing the maintenance of environmental

sustainability [5].

The Museum Pusaka Nias area is located at: (1) To the east it borders directly on the Indian Ocean, (2) To the north, it borders the Indian Ocean, (3) To the west, it borders North Nias, and (4) To the south, it borders Nias Regency. The Museum Pusaka Nias boasts pristine coastal views and a diverse array of conserved flora and fauna. This appeals to both local and international tourists. Here, visitors can learn about culture, biodiversity conservation, and natural herbal medicine management. Furthermore, the Museum Pusaka Nias offers several attractions, including exhibitions, a museum café, a mini zoo, accommodation, meeting rooms, a recreational park, and a library. However, the Museum Pusaka Nias needs to be further developed and promoted beyond Nias Island.

The management of the Museum Pusaka Nias needs to be carried out by collaborating museum principles and ecotourism principles so that it not only provides knowledge through artifacts and culture but also contributes to preserving biodiversity. In accordance with the vision of the Yayasan Pusaka Nias "To foster a sense of love for the heritage of Nias Island and encourage the community to know, appreciate, appreciate, maintain, and develop its constructive cultural values as a source of wisdom, educational media and development model".

Based on the observations made, the management of the Museum Pusaka Nias is quite good and in accordance with museum management standards which adopt the principles of ecotourism. According to Permandagri No. 33 of 2009, the principle is that ecotourism development can (1) occur a conservation process, (2) encourage the community to become economic drivers, (3) raise public awareness of the environment, (4) increase community satisfaction, (5) increase the role of the community in planning, utilizing and controlling ecotourism, and (6) accommodate local wisdom. However, there are several weaknesses so that the Museum Pusaka Nias cannot be fully said to be ecotourism because the main strength of the Museum Pusaka Nias is the preservation of culture/heritage. Therefore, it is necessary to analyze the management of the Museum Pusaka Nias in the conservation of culture, biodiversity, and sustainable herbal knowledge.

2. METHODS

This research uses a descriptive qualitative approach using a SWOT framework analysis to map internal and external factors in the management of the Museum Pusaka Nias in three important points, namely cultural conservation, biodiversity and herbal knowledge and their

relationship to ecotourism principles. A qualitative approach is used to find out and understand the meaning given by individuals or groups regarding a social phenomenon [6].

Meanwhile, for data analysis using SWOT analysis. SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is an identification used to systematically formulate strategies in decision-making related to very important matters in a government and also a company, to maximize performance and also targets that have become the main focus, namely the vision and mission of both government agencies and private institutions [7].

In this case, a SWOT analysis is needed to analyze the weaknesses, strengths, threats, and opportunities in managing the Museum Pusaka Nias. The research location is the Museum Pusaka Nias, located at Jl. Yos Sudarso No. 134-A, P.O. Box 16, Kota Gunungsitoli 22 812, Nias – Sumatera Utara – Indonesia. The research also utilized primary and secondary data sources. Primary data sources included documentation and interviews with visitors, managers, and staff at the Museum Pusaka Nias. Secondary data sources included literature, documents, the official Museum Pusaka Nias website, and relevant and credible media reports.

3. RESULTS AND DISCUSSION

Cultural Conservation at the Museum Pusaka Nias

Based on observations and interviews with cultural conservation staff at the Museum Pusaka Nias, Filemon Hulu stated that the Cultural Exhibition Pavilion contains over 6,000 artifacts, only a fraction of which are on display in the exhibition hall. Meanwhile, cultural heritage conservation involves renovating and rebuilding abandoned traditional houses. This aligns with the Museum Pusaka Nias vision and mission to preserve the diverse cultures and heritage of Nias Island.

The exhibition space consists of four pavilions, each with its own function:

1. Pavilion I is the main exhibition space, themed "Lakhomi Mefona" (Glory/Glory of the Past), showcasing various artifacts as material evidence of the "Ono Niha" nobility of the past.
2. Pavilion II is the second exhibition space, themed "Owasa/Fa'ulu" (Traditional Feast), showcasing traditional artifacts held by the nobility to affirm their social status and elevate their standing within the community.
3. Pavilion III displays kitchen utensils and other items from the daily lives of the Nias society in

ancient times, known as "Fa'auri Sero Maokho" (Daily Life).

4. Pavilion IV is a temporary exhibition space, showcasing short-term collections [8].



Fig 1. Exhibition Space in Museum Pusaka Nias

Biodiversity Conservation at Museum Pusaka Nias

The Museum Pusaka Nias not only focuses on cultural preservation but also develops biological conservation integrated into public education. The Museum Pusaka Nias features a mini-zoo that preserves endangered local wildlife. These animals include mammals, reptiles, and birds, including the endemic Nias Island parrot.

Meanwhile, the flora tends to preserve endangered trees, including *Eu Afoa*, *Boli*, *Simalambuo*, *Simalaesoo*, and several other large trees. Interviews with staff managing the flora conservation, Ms. Hatimah Farasi, stated that in addition to preserving cultural heritage, the group also preserves endemic flora and fauna, including documenting various types of traditional medicines that have begun to be forgotten.



Fig 2. Conservation of Flora and Fauna in Museum Pusaka Nias

Herbal knowledge in Museum Pusaka Nias

The Nias society possess significant herbal knowledge, driven by a lack of medical supplies in ancient times. As time progressed, this herbal

knowledge began to be abandoned. The Museum Pusaka Nias plays a role in collecting, documenting, and promoting the wisdom of their ancestors in utilizing nature to sustain life [9].

According to [10], plants are often used in traditional medicine to cure diseases, and the process of discovering edible plants always results in chance encounters with plants that have therapeutic properties that function to alleviate disease symptoms. The traditional medicine system of the Nias society, which has been passed down from generation to generation, relies heavily on medicinal plants. Nias society use Nilafu (herbal healing) as a local knowledge for healing diseases, which utilizes plants as medicine. Nilafu is the process of using medicinal plants by applying pastes [12]. Its primary function is to treat broken bones, wounds, sprained ankles, body aches, fever, and various other ailments. The Nias society believe that plants and the natural environment can be used to cure illnesses.

The Museum Pusaka Nias places herbal knowledge as part of cultural and environmental preservation in Nias. The herbs are located in a traditional herbal garden along the empty area of the Museum Pusaka Nias, designed and named as a living laboratory, introducing plant-based healing practices to visitors. An interview with Ms. Fatimah Farasi revealed that efforts to conserve herbal knowledge are consistently promoted, and at every event in collaboration with the private sector and the government, they also promote the use of herbs to cure various ailments. The various products produced by the Museum Pusaka Nias, which manages herbal products, include:

1. Traditional Nias Medicine
2. Instant Ginger
3. Instant Turmeric
4. Instant Javanese Curcuma
5. Pure Coconut Oil
6. Mahkota Dewa (God's Crown) Concoction.

The activities of the Museum Pusaka Nias in the field of Flora are to develop several medicinal plants, both in the form of fresh plants such as moringa leaves (bulu muru), torch ginger (silimo), beluntas, hibiscus (söma-söma), pacing (hendrifo), purple leaves (nazalöu), tapak liman (suku bumi), tapak dara, noni, datura (sikaso), sari wangi (sarelahia göröbao), lemongrass (sare lahia), dringo (sarango), benge (under boli), brotowali, lempuyang, binahong, pomegranate, breadfruit leaves (bulu suku), Chinese ketepeng (zösa), andong (endruo), several dried simplicia in the form of kejobeling leaves, sambiloto herb (kanina), mahkotadewa fruit, Taiwanese kelingkit leaves which are better known as Mutiara leaves, or in instant forms such as instant temulawak (undre gaza), instant turmeric (undre manu), instant

ginger (lahia). There are more than 50 herbal plants on Nias Island and some are conserved at the Museum Pusaka Nias.



Fig 3. Herbal plants found in Museum Pusaka Nias

SWOT Analysis in Management Museum Pusaka Nias

The Museum Pusaka Nias is not just a museum that collects various heirlooms but also participates in the management and conservation of various Nias heritages, both tangible and intangible. The following table presents a SWOT analysis of the Museum Pusaka Nias.

Table 1. SWOT Analysis of the Museum Pusaka Nias

Internal	
Strenght	Weakness
<ul style="list-style-type: none"> Natural views in the form of beaches The exhibition space consists of Pavilions 1-4, each of which has its own function. Minizoo Museum Pusaka Nias Museum Pusaka Nias attraction Museum Pusaka Nias lodges Herbal Garden and Recreational Park Museum Pusaka Nias café's Museum Pusaka Nias meeting room Museum Pusaka Nias library 	<ul style="list-style-type: none"> Lack of skilled human resources to manage each section of the Museum Pusaka Nias Limited Funds in the continued management of the MuseumPusaka Nias. Public participation in cultural preservation at the Museum Pusaka Nias is still low. Travel accommodation is quite expensive for tourists from outside Nias Maintenance and updating of facilities that are still standard, thus reducing the demand for visitors to visit
Eksternal	
Opportunity	Threat
<ul style="list-style-type: none"> The Museum Pusaka Nias packaging sustainable edutourism based on culture and 	<ul style="list-style-type: none"> Natural disasters such as earthquakes and tsunamis because it is located right next to the Indian Ocean

nature.

- Leveraging the wealth of herbal knowledge as featured content
- Expand institutional partnerships and policy support
- Undertake digital transformation to attract the attention of generation Z
- Strengthening the brand of Nias' cultural and natural destinations
- Integration of local scientific findings based on thematic exhibitions
- Degradation of coastal ecosystems and pressure on biodiversity.
- Erosion of Traditional Knowledge by the Development of the Times
- Dependence on volatile external support
- Modernization of digital engagement so that it can reduce cultural values slowly

Strength

Natural views in the form of beaches

Coastal areas offer a variety of attractions. The experiences tourists have in these areas satisfy all their senses which of sense of sight with the natural beauty and characteristics, the sense of hearing with the sound of the waves and animals that still inhabit certain in coastal areas, the sense of smell aroma of the sea or other bodies of water and sense of touch with warmth of the sun, the breeze, and the softness of the beach sand [20]. The Museum Pusaka Nias is located right next to the beach, which is part of the museum's cultural-natural landscape. The beach is directly adjacent to gardens, traditional houses, megaliths, and a traditional herbal garden, allowing visitors not only to enjoy the museum's collections but also to explore the beautiful coastal scenery. The beach serves as a light, educational recreation area and can also be used as a bathing spot for children and adults.

The exhibition space consists of Pavilions 1-4, each of which has its own function.

Museum Pusaka Nias (MPN) exhibition space is arranged in four main pavilions that showcase the core cultural and historical richness of Ono Niha, translated into two languages, Indonesian and English, to help visitors understand the context, function, and meaning of each object. Additionally, the exhibition showcases megalithic stones and traditional houses from various regions, displayed in open spaces surrounding the pavilions. Museum Pusaka Nias Pavilion serves as a learning space or a forum for community development [21]. The collection exhibited in this pavilion is a variety of artifacts preserved by the Nias Heritage Museum, which is recorded as more than 6,000, including weapons, jewelry, clothing, ritual religious objects, musical instruments and household items as well as a small number of objects related to the biology and environment of

Nias. In order for the preserved objects to be maintained and preserved and kept away from damage, it is necessary to design the pavilion interior in accordance with Indonesian museum standards which take into account functionality, safety, comfort and beauty [22].

Museum Pusaka Nias Minizoo

The Museum Pusaka Nias provides a minizoo that presents the native fauna of Nias Island in an educational way. The presence of a mini zoo has a primary function in carrying out conservation, protection, preservation, and other utilization activities related to both ex situ and in situ [23]. Based on an interview conducted with the main director of the Nias Heritage Museum, the main goal of this zoo is to protect the native habitat of Nias which is starting to become extinct. The minizoo complements recreation, flora and fauna conservation in Nias, and environmental education. The minizoo functions as a family friendly learning space, displaying animals within an interpretive corridor that explains their origins, habitats, and ecological roles in Nias. The minizoo features mammals, reptiles, and birds native to Nias Island, enveloping them in a cultural landscape and ethical use of natural resources.

Museum Pusaka Nias Attractions

The Nias Heritage Museum offers a variety of attractions through permanent exhibitions across four pavilions. These include Ono Niha artifacts such as royal jewelry, weapons and war equipment, ritual instruments, and religious objects, including the Omo Sebua. The attractions within the Museum Pusaka Nias play an important role in telling the stories of the ancestors of the Nias people, enabling people to reflect on their past, understand the present, and plan for a better future [24].

Lodges

Traditional houses are part of the cultural heritage that have great potential as tourist attractions [25]. The Museum Pusaka Nias strives to provide an engaging experience, transforming traditional Nias houses into accommodations equipped with modern amenities (bathrooms, fans, and televisions) to provide a unique experience for tourists.

Herbal Garden and Recreational Park

Within the museum complex, there is a herbal garden and a recreational park, a concrete manifestation of the Nias Heritage Museum Foundation's mission to preserve culture and nature. Visitors can see a series of medicinal plants and cultural landscapes that connect local knowledge with the beauty of the coast in one area.

The preservation of flora and fauna, including herbal plants, is a primary focus of the Museum Pusaka Nias. The herbal garden is a sign that Nias Island is rich in medicinal plants that need to be preserved.

Museum Pusaka Nias Café's

The Museum Pusaka Nias also features a café serving simple snacks and dishes. The café is nestled within the museum complex's manicured gardens and small beach.

Museum Pusaka Nias Room Meeting's

The Museum Pusaka Nias offers a variety of meeting rooms designed for meetings, training sessions, small conferences, celebrations, and community events. These meeting rooms feature distinctive Nias architecture and are integrated directly into the park, small beach, and other facilities.

Museum Pusaka Nias Library

The library provides library materials for access, on-site reading, or loan to be read at home [26]. The Museum Pusaka Nias provides a library that functions as a special reference for studying the culture, history, and heritage of Nias Island while also providing relevant publications for the needs of community learners and researchers. The collection in this library consists of around 1,130 titles, with around 328 titles specifically about Nias.

Weakness

Lack of skilled human resources to manage each section of the Museum Pusaka Nias

The Museum Pusaka Nias, as a place for conserving various Nias heritage, also faces a shortage of skilled human resources. An interview with the Director of the Museum Pusaka Nias, Mr. Nata'alui Duha, revealed that skilled workers are still insufficient to manage the museum. The remaining staff members are juggling multiple roles, such as day curator, weekend guide, and various other roles.

Limited Funds in the continued management of the Museum Pusaka Nias

The limited funding for the management of the Nias Heritage Museum is part of a social non-profit organization and a non-governmental public organization. As an institution that preserves, maintains, and promotes Nias cultural heritage, the museum requires ongoing financial support for collection maintenance, facility development, visitor service improvement, and educational programs and cultural promotion. The museum serves as a center for education, research, and

recreation, enabling the public to connect with the past and understand the development of civilization. Therefore, limited funding is one of the weaknesses of the Nias Heritage Museum.

Public participation in cultural preservation at the Museum Pusaka Nias is still low

Managing the Museum Pusaka Nias as a center for cultural preservation requires community involvement, from program support to attendance at activities to curatorial collaboration. However, the reality on the ground shows that community involvement has not yet shown optimal indicators. This is due to the inconsistency between visitor expectations and reality. For example, negative visitor reviews on public channels highlight the disparity in the quality of the experience in both the outdoor area and the visitor service.

Travel accommodation is quite expensive for tourists from outside Nias

One of the challenges in Nias's tourist areas is the relatively high cost of travel. Air fares start at 1,000,000 rupiah and up. This discourages tourists from outside Nias from visiting. Meanwhile, the sea journey takes 12 hours from Sibolga Port to Gunungsitoli Port.

Maintenance and updating of facilities that are still standard, thus reducing the demand for visitors to visit

Governance factors also play a role. Research on government contributions to MPN notes that development often relies on external support (programs, funding, personnel, ideas), which, if not balanced by a strong base of local participation, can slow down physical/amenity renewal with a ripple effect on the quality of the visitor experience.

Opportunity

The Museum Pusaka Nias packages sustainable edutourism based on culture and nature

Museum Pusaka Nias is a unique attraction for tourists, offering a learning experience that combines cultural heritage with natural landscapes. Through exhibition pavilions, visitors can experience the Ono Niha way of life in the past, shaded areas for relaxation, authentic traditional houses, megaliths, a traditional herbal garden, a mini zoo of local wildlife, a library, meeting rooms, and traditional house accommodations, including an edutourism ecosystem that combines cultural interpretation, nature creation, literacy, and community participation. In this case, the Museum Pusaka Nias plays a role as an educational institution that is able to provide a fun learning experience with interactive displays of

space or collections so that it can develop the imagination and hone the skills of various generations [27].

Utilizing the wealth of herbal knowledge as featured content

The preservation of medicinal plants is not merely a complement to the landscape but also a valuable educational tourism resource. The traditional herbal plants on the museum grounds represent a step in the sustainable management of Museum Pusaka Nias. Knowledge of herbal plants is a key aspect of cultural heritage, often serving as a source of medicinal knowledge and community health practices [28].

Expanding institutional partnerships and policy support

As the first museum in Nias, the Museum Pusaka Nias has a strong foundation as a center for cultural and natural preservation and educational tourism. Services are continuously improved through various strategic steps to strengthen and expand partnerships to accelerate policy support for improving the quality as a museum.

Carry out digital transformation to attract the attention of generation Z

Today, capturing the attention of Generation Z requires a creative approach. Generation Z is familiar with social media, mobile devices, and video. Therefore, the Nias Heritage Museum is improving its service quality through digital transformation, such as presenting stories of Nias culture and nature in short video format. This is because Generation Z was born and grew up amidst technological developments, making internet technology a necessity for entertainment, work, and education.

Strengthening the brand of Nias' natural cultural destinations

The strength of the Museum Pusaka Nias is a strategic location near the town of Gunungsitoli, which is also a coastal area. The Museum Pusaka Nias presents the charm of exhibits of ancient tools, authentic traditional houses, megaliths, a herbal garden, a mini zoo, a small beach, a library, a cafe, meeting rooms, and traditional house accommodations. This demonstrates the identity of the Museum Pusaka Nias as a reflection of the past and present of the Nias people cultures.

Integration of local scientific findings based on thematic exhibitions

The Museum Pusaka Nias serves as a center for information and education on cultural heritage. The Museum Pusaka Nias has the potential to become a place that provides a variety of

information and cultural heritage of Nias, providing a comprehensive experience for visitors, including bilingual exhibitions, authentic traditional houses, megaliths, a herbal garden, a mini zoo, a small beach, a library, a café, meeting rooms, and traditional house accommodation.

Threat

Natural disasters such as earthquakes and tsunamis because it is located right next to the Indian Ocean

Nias Island, located west of Sumatra, sits on a megathrust, a plate-meshing zone that harbors significant tectonic energy. The meeting zone between the plates forms a trough known as the collision zone [28]. The Museum Pusaka Nias is located directly adjacent to the Indian Ocean, is vulnerable to the threat of tectonic disasters. Therefore, earthquake and tsunami preparedness measures are necessary to protect the various historical objects housed within the Museum Pusaka Nias.

Degradation of coastal ecosystems and pressure on biodiversity

Coastal areas and small islands are the meeting point of two terrestrial ecosystems, namely land and sea, and are areas that are always dynamic, experiencing changes with a very short time cycle [29]. Coastal ecosystems are inextricably linked to damage, both by visitors and by natural environmental changes. This can lead to degradation of the coastline around the Museum Pusaka Nias if visitors continue to neglect and litter. Therefore, a strong commitment is needed from visitors to continue to avoid littering on the beach.

Erosion of Traditional Knowledge by the Development of the Times

Traditional knowledge is increasingly being eroded by modern developments. Today's youth perceive studying traditional knowledge as uninteresting and useless. However, cultural preservation requires young people at every stage of the process. Therefore, youth involvement is crucial in transforming traditional knowledge into modern forms without diminishing the authentic aesthetic value of the original culture. These challenges are part of the social challenges of the digital era. Therefore, to ensure traditional knowledge is not lost, open dialogue on cultural identity, mental health, and social engagement in a digital context is key to creating more engaging traditional knowledge, thereby fostering healthy and sustainable growth for Generation Z [30].

Dependence on volatile external support

Based on interviews conducted, it was found that the Museum Pusaka Nias remains dependent on external support, making this support dynamic and fluctuating in terms of the sustainability of a program, service, or organization. Waiting for grants and external funding often creates an unstable pattern regarding the long-term operational needs for high-level care of preserved artifacts.

Modernization of digital engagement so that it can reduce cultural values slowly

On the other hand, knowledge should keep pace with the times. However, some of the impacts, including modernization and digital interaction, are changing the way young people interact with culture. Museums should reflect meaning, values, and the process of their inheritance. The presence of technology is slowly eroding history, ethics, rules of participation, and the relationship between humans and nature, which should be experienced by humans themselves, not through visualization and viralization.

Strategi Museum Pusaka Nias Management Strategy based on SWOT Analysis

1. Strategy of SO (*Strenght-Opportunity*)

- 1) Provide a gallery of Nias's coastal and maritime culture, not relying solely on artifacts. The marine collection, exhibition space, and curatorial team have had a significant impact on the development of the Nias Heritage Museum. To capitalize on this opportunity, it is necessary to enhance services that attract educational tourism and ecotourism. The most effective approach is to provide educational services on the conservation of mangrove forests, mangrove meadows, and coral reefs.
- 2) Provide school and citizen science programs, highlighting the educational track record of students and teachers and improving learning facilities.
- 3) Provide a "Nias Blue Carbon" exhibition corner and mangrove planting activities.
- 4) Collaborate with the local curriculum to provide learning packages for history, art, science, geography, and field practice.
- 5) Provide an annual "Nias Coastal & Culture" festival, which includes a creative market, coastal knowledge clinic, and curated performances.

2. Strategy of WO (*Weakness-Opportunity*)

- 1) Establishing an accurate digital archive containing high-resolution photographs, simple 3D scans of certain artifacts, and

- audio-video recordings of traditions (e.g., Hoho dances and dance performances), complete with metadata, provenance, traditional signs, and community attribution.
- 2) Establishing a citizen science hub that leverages partnership opportunities in conservation area management with universities/BRIN, utilizing lightweight methodologies and live data exhibitions in the gallery.
 - 3) Providing a disaster science exhibition with cultural resilience and local knowledge as an opportunity for public education and preparedness, while addressing weaknesses in the scientific narrative that have not yet been developed into permanent content.
 - 4) Developing a three-year conservation plan (monitoring temperature and humidity, preventative maintenance, and priority restoration) funded by a time-bound collaboration complemented by revenue diversification.
- 3. Strategy of ST (*Strength-Threats*)**
- 1) Museum-based disaster resilience to face tectonic earthquakes, tsunamis, and sea level rise.
 - 2) Developing digital ethics and labeling of traditional knowledge to prevent the erosion of meaning and misuse of culture.
 - 3) Documenting provenance and networks to prevent the trafficking of artifact collections and biodiversity from various transboundary threats.
 - 4) 3R campaigns and citizen science to maintain environmental quality and participatory science to prevent the threat of plastic/microplastic pollution.
 - 5) Diversifying revenues and public partnerships to mitigate the threat of funding volatility and tourism seasons.
- 4. Strategy of WT (*Weakness-Threats*)**
- 1) Dependence on volatile external funding and seasonal visitation needs to be balanced by establishing operating reserves, budget scenarios, and modularizing programs, opening hours, and maintenance cycles to allow for gradual adjustments without disrupting core functions.
 - 2) Limitations of online curation policies must be addressed through selective digitization of tightly curated materials, complemented by Traditional Knowledge (TK) Labels/Notices as non-legal markers regarding access, attribution, sensitivity, and prohibitions on commercialization; while also adding metadata on provenance and context (cultural narratives, participation rules).
 - 3) Weaknesses in humid tropical climate control and collection documentation should be strengthened through inventory/provenance according to Object ID/CIDOC standards, temperature-humidity (RH) monitoring with alarm thresholds, access zoning, and acquisition and handling policies that adhere to the 1970 UNESCO Convention (prevention of illegal import/export, restitution).
 - 4) Given its limited internal ecological research capacity, the museum took on an evidence-based risk communication role: presenting IPCC AR6 findings on the impacts of sea-level rise and coastal squeeze on coastal ecosystems in disaster education materials, and linking the national microplastics review to the context of Gunungsitoli City's waste management (historically low service coverage). Simple community action programs (light citizen science, 3R campaigns, interpretive tours) were chosen to reduce the burden of primary research while still reducing exposure to capacity weaknesses in coastal multi-stressor threats.
 - 5) The Museum Pusaka Nias holds back on short-term program expansion and chooses a sustainable transmission format such as small cross-generational classes, practical workshops (music, carving, handicrafts), interpretive tours in the cultural and ecological context of Nias and provides space for the community as the subject.

4. CONCLUSION

The Museum Pusaka Nias is the only museum on Nias Island that serves to preserve various visible and invisible cultural heritage sites, as well as educational recreation, workshops, a library, herbal knowledge, a café and accommodation, as well as various regular educational programs for teachers and laypeople, in an effort to conserve all Nias heritage, which is increasingly being neglected by the current generation.

A SWOT analysis shows that the Museum Pusaka Nias requires collaboration from various parties to continue its development. The Museum Pusaka Nias primary strengths are its medicinal plants, pavilions, exhibitions, accommodation, café, and various other tourist attractions. Therefore, to maintain and develop the Museum's core strengths, the management must consider how to strengthen institutional resilience and ensure that cultural conservation, ecological knowledge

enrichment, and herbal medicine practices work synergistically, ethically, and evidence-based to maintain the identity of Nias Island while strengthening the well-being and resilience of the island's communities.

5. ACKNOWLEDGEMENTS

This study aims to identify various supporting and inhibiting factors in the management of the Museum Pusaka Nias. Preserving Nias' cultural heritage, strengthening coastal biodiversity, and maintaining herbal knowledge are efforts that require the synergy of all stakeholders. This research can serve as a reference for other researchers and also provide new knowledge to its readers.

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