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Field Survey on Maritime Literacy and Seaweed Food Security in Community Service Initiatives Informed by Folklore

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Abstract. Coastal communities in Eastern Indonesia, particularly in the 3T (frontier, outermost, disadvantaged) regions, face complex challenges in managing abundant marine resources despite their cultural richness and ecological potential. This study was conducted in Waiheru Village, Ambon, Indonesia which represents a coastal community where traditional maritime folklore remains a living heritage yet has not been optimally integrated into food security strategies. The research aimed to explore the level of maritime literacy and the utilization of seaweed for household food resilience by mapping the potentials and problems faced by women and youth as primary community actors. A qualitative field survey was carried out involving 60 respondents consisting of housewives and village youth, using open-ended questionnaires, semi-structured interviews, and direct observation. Thematic analysis revealed that folklore, such as the *Nenek Luhu* legend, can serve as an effective medium for strengthening ecological awareness and maritime identity. Findings indicated that housewives are central in basic seaweed processing for household consumption, but their skills remain limited to low-value products, while youth show strong interest in digital-based promotion despite constraints in technical capacity and internet access. This research contributes to science by offering an integrative model that links culture, ecology, and community-based economy as a foundation for sustainable coastal development.

Keywords: coastal communities; food security; maritime literacy; seaweed; youth empowerment

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INTRODUCTION

Maluku Province is recognized as an archipelago, with 92.4% of its territory being sea, and the predominant portion of its inhabitants depends on the fisheries sector and seaweed production for their sustenance (Dinas Kelautan & Perikanan Provinsi Malluku, 2025). This geographical position renders the sea the primary source of sustenance, cultural identity, and the foundation of economic resiliency for coastal communities. Coastal regions in Maluku that are remote, peripheral, and underdeveloped continue to encounter numerous constraints, including limited access to markets, funding, production facilities, and seafood processing expertise (Badan Perencanaan Pembangunan Daerah (Bappeda) Provinsi Maluku, 2024). This results in the considerable marine potential not substantially affecting the enhancement of community well-being.

A primary concern is insufficient maritime literacy, encompassing knowledge of the sea, resource utilization, and the assimilation of maritime cultural values (Wang et al., 2025). The extensive maritime folklore of Maluku conveys lessons of morality, ecology, and cultural identity; nevertheless, it has not been effectively leveraged for educational purposes and community empowerment. Conversely, seaweed, as a prominent commodity, possesses significant potential to enhance food security and bolster the local economy, both through food goods (crackers, confections, snacks) and non-food products (organic fertilizers, cosmetics, soaps) (Webb et al., 2023). Regrettably, its application remains confined to its unprocessed state, yielding minimal added value.

Prior research indicates that local knowledge, exemplified by the sea sasi tradition, significantly contributes to the sustainability of coastal resources and the enhancement of social cohesion (Hajar Suryawati et al., (2025); Rakuasa & Pinoa, (2023)). Additional research substantiates the significance of marine literacy as a foundation for enhancing identity and advancing the maritime

industry (Arifin et al., (2025); Hapidin et al., (2020)). A study on the evolution of digital branding and marketplace-oriented MSME products emphasizes the significance of innovation in enhancing competitiveness (Martadinata et al., 2024).

Marine literacy is theoretically defined as both the capacity to interpret the sea ecologically and the process of assimilating knowledge, skills, and cultural values related to marine contexts (Arifin et al., 2025). Storytelling-oriented marine literacy can enhance cultural identity and foster practical ecological awareness for coastal resource management (Nofiasari & Saputra, 2024).. From a food security standpoint, seaweed functions as a nutritional source, an alternative food option, and a value-added product that, if effectively managed, can enhance food availability and accessibility (Maxwell et al., (1992); FAO, 2019).

From the standpoint of community empowerment, housewives serve as significant contributors to local food production, whereas youth act as catalysts for innovation and technology adoption (Chawla & Derr, 2012). Recent research demonstrates that the integration of indigenous knowledge with digital innovation effectively enhances the competitiveness of coastal MSMEs (Martadinata et al., 2024). Consequently, community service initiatives that combine folklore-based marine literacy with seaweed food security are significantly pertinent for enhancing the economic resilience of coastal communities.

Furthermore, this program directly supports the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger) by promoting seaweed as a nutrient-rich alternative food resource and strengthening household-level food security through product diversification training. It also aligns with SDG 14 (Life Below Water) through educational initiatives aimed at enhancing maritime literacy, fostering ecological awareness, and revitalizing cultural knowledge related to marine conservation. In line with findings presented in *The Potential of Seaweed to Advance Food, Environmental and Gender Dimensions of the SDGs* (United Nations, 2024), seaweed holds strategic potential for realizing both SDG 2 and SDG 14, as it simultaneously functions as a sustainable food source and contributes to marine ecosystem resilience. This reinforces the relevance of integrating seaweed-based innovation into community empowerment programs in coastal regions.

This activity is essential for linking theoretical concepts (maritime literacy, local culture, coastal ecology) with practical applications (seaweed processing, branding, digital marketing). We anticipate that the balance between cultural and economic factors will result in a sustainable strategy for community empowerment. This article aims to present the findings of a field survey about marine literacy and seaweed-based food security in the 3T coastal regions of Maluku, as well as to delineate the potential and challenges faced by partners. This community service initiative aims to establish a basis for an empowerment strategy rooted in local expertise, which will both reinforce marine cultural identity and augment the economic ability of coastal communities.

METHODS

This field survey was executed in Waiheru Village, Ambon City, Maluku, recognized as a coastal region with potential for seaweed agriculture and marine knowledge rooted in folklore. The participants in this activity include housewives engaged in seafood processing for domestic use and small enterprises, together with village youngsters who function as catalysts for innovation and local business advancement. A total of 50 respondents were selected through purposive sample procedures, based on their engagement in marine activities, seafood processing, and community social roles.

The instruments employed in the survey consist of open questionnaires, field observation sheets, and semi-structured interview guides. This tool aims to investigate facets of maritime literacy, seaweed consumption patterns, and the challenges encountered in promoting food security. Maluku marine folktales, like the legends of Nenek Luhu and Gunung Api Banda, were utilized as a stimulant. These folktales were utilized to evaluate respondents' comprehension of the interplay between local culture, maritime identity, and coastal resource management techniques.

The survey process was conducted in three phases. The initial phase entailed administering questionnaires to ascertain respondents' preliminary understanding of maritime literacy and the application of seaweed. The second step involved comprehensive interviews and focus group discussions (FGDs) with housewives and teenagers to delineate local potential (varieties of seaweed, processing methods, and sea sasi traditions) and to identify the primary challenges encountered in both production and distribution.



Figure 1. Maritime Literacy Activities at SUPM Waiheru

The third step entailed direct field observation to record community activities associated with seaweed consumption and maritime cultural values.

The acquired data were subjected to qualitative analysis by thematic analysis. Responses from open-ended questionnaires, interview transcripts, group discussion outcomes, and observation notes were categorized thematically into areas including maritime literacy potential, seaweed processing techniques, technical and economic challenges, and the influence of local culture. The analytical approach involves evaluating patterns, correlations, and meanings derived from the data, so generating a thorough overview of marine literacy and food security circumstances for coastal residents in Waiheru Village.

RESULTS AND DISCUSSION

Maritime Literacy Proficiency

This subsection presents the results and discussion related to maritime literacy proficiency, which served as the primary focus of the first phase of the community service program conducted at SUPM Waiheru. The activity, held on 7 October, was designed to strengthen adolescents' understanding of maritime culture, marine conservation, and the reinterpretation of folklore as an educational medium. This effort aligns with SDG 14 Life Below Water, particularly in fostering youth awareness of the importance of protecting marine ecosystems and ensuring their sustainability. Through a combination of survey-based assessments, observational approaches, and interactive instructional sessions, the program not only facilitated knowledge transfer but also cultivated positive attitudes among students toward marine related issues. In addition to improving conceptual understanding, the activity generated creative outputs in the form of 20 maritime stories written by the students as a reflection and internalization of cultural values and marine conservation principles. The following section presents documentation of the activity as a visual representation of the educational process undertaken showed in Figure 1.

The survey results indicate that most respondents possessed minimal initial knowledge of marine literacy. Of the 60 respondents, hardly 35% could articulate the role of maritime folklore in everyday life; however, following group discussions and a brief introduction, this percentage rose to 78%. Furthermore, hardly 40% of participants recognized the sasi laut tradition as a conservation practice, but following the survey activities, comprehension rose to 72%.

Table 1. Variations in Maritime Literacy Levels Among Respondents in Waiheru Village

Aspects of Maritime Literacy	Pre-Survey (%)	Post-Survey (%)
Understanding the function of maritime folklore	35	78
Knowing the sasi laut tradition as conservation	40	72
Linking local culture with food security	28	65

The analysis of the data indicates that marine folklore has been useful as an instructional tool for coastal communities. This corresponds with (Arifin et al., (2025) thesis of maritime literacy, which asserts that maritime literacy includes not



Figure 2. Seaweed Processing Activities Conducted by Waiheru Housewives

just technical knowledge of the sea but also the internalization of maritime cultural values. Through this internalization, society perceives the sea not just as an economic resource but also as an integral component of cultural identity that must be preserved. Consequently, employing folklore within marine literacy can augment ecological consciousness and reinforce the maritime identity of communities, especially in coastal regions such as Waiheru Village.

The Function of Housewives in Seaweed Processing

This subsection presents the results and discussion related to the role of housewives in seaweed-based food processing as part of the second phase of the community service program, conducted on 18 October 2025 in Waiheru. The activity targeted local housewives and was designed to support SDG 2 – Zero Hunger by promoting the utilization of seaweed as a nutritious alternative food source and by providing training in product diversification. This initiative seeks to strengthen community food security through capacity-building efforts that equip women with practical skills, knowledge of seaweed's nutritional value, and techniques for developing value-added products. Furthermore, the program emphasizes the strategic role of housewives as agents of household food management and community-level economic resilience. Prior to presenting the visual documentation, this section offers an overview of the educational context and relevance of the activities undertaken.

Seventy percent of housewives in Waiheru Village have previously processed seaweed, but solely into basic items such as agar-agar or vegetables. Merely 25% have ever sampled value-added items (e.g., seaweed confectionery or crackers). The primary impediments identified were insufficient technical skills (65%) and equipment deficiencies (58%).

Table 2. Degree of Engagement of Housewives in the Utilization of Seaweed

Type of Processing Activity	Respondents (%)
Processing seaweed for household consumption	70
Processing seaweed for sale (simple products)	45
Developing value-added products	25
Never processing seaweed	30

The findings align with the theory of community-based food security proposed by (Maxwell et al., 1992), which highlights the dual role of households as both producers and consumers within the local food system. In this context, housewives in Waiheru not only contribute to household food consumption through traditional seaweed processing but also hold significant potential to enhance local food production. By directing their role toward strengthening food availability and access, housewives can become key actors in improving household resilience and supporting broader community food security initiatives.

The Role of Youth in Innovation and the Creative Economy

The survey shows that 80% of youth are interested in using social media to promote local products, although only 30% have ever attempted to market marine products online. The main barriers are limited digital skills (55%) and unstable internet access (40%).

Table 3. Youth Interests and Constraints in the Creative Economy

Aspect	Respondents (%)
Interest in using social media for promotion	80
Experience in online product marketing	30
Constraint: digital skills	55
Constraint: internet access	40

These findings are in line with the theory of youth as agents of change proposed by (Chawla & Derr, 2012), which underscores the strategic role of young people in driving innovation and linking local communities to wider market networks. In the context of Waiheru, the enthusiasm of youth to engage with digital platforms for promoting seaweed products illustrates their potential to act as catalysts of transformation. By bridging traditional practices with modern technological opportunities, they can strengthen local economic resilience and expand community access to broader markets.

Key Challenges in Seaweed Utilization

The interview results reveal three major issues: (1) limited processing – 65% of respondents sell seaweed in raw form, (2) weak market access – 70% rely on middlemen who offer low prices, and (3) low maritime literacy – only 28% of respondents associate folklore with local economic practices. These findings reinforce the sustainable livelihood theory proposed by (Chambers & Conway, 1992), which emphasizes that community resilience depends on the balance of various assets. In the case of Waiheru, although the community possesses abundant natural assets in the form of seaweed and strong social assets through maritime traditions such as *sasi laut*, significant gaps remain in human assets, particularly technical skills, and financial assets, especially in terms of access to markets. This imbalance limits the community's ability to fully capitalize on its natural and cultural resources, thereby constraining opportunities for sustainable economic development.

Implications and Research Contributions

The survey findings in Waiheru Village indicate that maritime literacy based on folklore can serve as an instrument to strengthen cultural identity while simultaneously educating communities on coastal resource management. Housewives hold considerable potential in reinforcing locally based food security, whereas youth can be directed toward the utilization of digital technology to expand market outreach. The contribution of this study lies in demonstrating that an integrative culture–economy–ecology approach can serve as a relevant empowerment model for frontier, outermost, and disadvantaged (3T) coastal regions.

CONCLUSION

A field survey conducted in Waiheru Village reveals that maritime literacy rooted in folklore plays a crucial role in strengthening cultural identity and ecological awareness among coastal communities, although its utilization remains limited to its traditional function as family entertainment. Housewives hold a strategic role in seaweed processing for household needs and food security but continue to face challenges related to technical skills and equipment. Meanwhile, youth demonstrate potential as agents of innovation, showing high interest in leveraging digital media for product marketing, yet are constrained by limited access to technology. These findings underscore that the integration of maritime literacy, marine product processing, and digital technology utilization can serve as a relevant approach to enhancing food security and empowering 3T (frontier, outermost, and disadvantaged) coastal communities. The contribution of this study to the body of knowledge lies in its conceptual model that links cultural, ecological, and economic dimensions within a unified framework of community engagement, which can be replicated in other coastal regions with similar characteristics and provide a foundation for the development of sustainable community-based development strategies.

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