

Blue economy and coastal community toward sustainable development in Teluk Cenderawasih, Papua, Indonesia

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Abstract. Several previous studies were investigating the role of the blue economy on the local community in the coastal areas to develop a method for marine sustainability. This study aimed to examine the nexus between the blue economy and its impact on the economic, environmental, and cultural values of the local community in Teluk Cenderawasih. Data were collected from Biak Numfor, Nabire, and Manokwari regencies using surveys data. Cross-tabulation was used for examining the aspects of economy, environment, and cultural values. The results showed that the blue economy has improved the welfare of the local community by increasing income generation through the diversification of fish products. The local community benefited from using the blue economy by adopting sustainable traditional methods for managing marine-based resources. Furthermore, the blue economy enables the Papuan community to adopt cultural values (local wisdom) for managing marines' sustainability using the *sasi* method. The result also showed that several challenges disrupt the implementation of the blue economy, including lack of support from local government, unsustainable practices, exploitation, declining cultural values, and conflict between ethnic leaders to determine *sasi* location.

Key Words: blue economy, coastal governance, marine-based livelihoods, marine ecosystem management, Papua Indonesia, sustainable fisheries.

Introduction. The blue economy is currently being implemented globally in response to the need for societies to strike a balance between economic development and environmental issues, as well as community participation in the blue economy program supported by the local governments. This method is rooted in the concepts of sustainable development and has been adopted in many countries. The term "blue economy" can be explained as the relationship between sustainability, economics, the environment, and social inclusion. The concept appears to complement sustainable development, placing a new emphasis on economy, environmental outcomes, investment, capital and infrastructure, employment, and social inclusion (Lee et al 2020; Choudhary et al 2021). Therefore, the blue economy is a solution for promoting sustainable development and plays a strategic role in meeting the concerns of future generations.

The implementation of the blue economy in Indonesia has played an important role in increasing economic growth and also giving benefits to the protection of environmental and social aspects. As the world's largest archipelago, the rich natural resources of Indonesia have the potential to drive economic growth but at a high environmental cost (Xuan 2024). The government is dedicated to enabling inclusive and sustainable development for all members of society, particularly women and children, as well as preserving the health of the marine ecosystem (Arifin et al 2024).

In the context of the West Papua region, the blue economy has been implemented particularly within the Teluk Cenderawasih National Park. Adjacent to the Pacific Ocean, this area is rich in marine resources where local communities apply local wisdom - a form of traditional cultural practice that promotes harmony between human activities and marine ecological balance. Teluk Cenderawasih serves as a conservation area that hosts

a wide range of protected species. However, several factors influence the effective implementation of the blue economy in this region. Therefore, the objective of this study was to investigate the implementation of the blue economy and its impact on the economic, environmental, and cultural dimensions of Teluk Cenderawasih.

Literature review. Several studies have investigated the role of the blue economy in improving the local community by maintaining sustainable development. For instance, the blue economy operates concurrently with sustainable development, which both focus on habitat management, marine ecosystem, and supporting biodiversity (Pace et al 2023). Aside from being beneficial economically for the community, marine ecosystem services are also prominent for global environmental dynamics, including regulating climate through providing oxygen, absorbing heat, carbon sequestration, and protecting against the adverse impacts of climate change (Ani & Robson 2021).

According to Pauli (2010), the blue economy is a business model based on the inspiration of innovation on the benefit of resources from waste production, aiming to create 100 million job opportunities, generate revenue, and achieve zero carbon emissions in 2050. The blue economy is a key aspect of implementing sustainable development goals. In general, sustainable goals are the commitment of the global community towards harmonious development, not only focusing on the current needs but also on future generations. The concept of sustainable development considers the aspects of economic, environmental, and social needs, specifically participation from the community.

The world is currently facing many challenges, specifically in developing and striking a balance between human needs and environmental protection, while also considering the future generation. Therefore, the blue economy is a solution for implementing sustainable development. The United Nations (2014) defined the blue economy as "an ocean economy that aims at the improvement of human well-being and social equity, while significantly reducing environmental risks and ecological scarcities". Sanjeewa (2024) classified the colour of economy as red and green focusing on medical issues and agriculture, respectively. The yellow colour refers to the improvement of food production, while the brown economy relates to crops and livestock. The white economy refers to the associated production of chemicals and materials, while the blue economy is related to marine habitats.

As shown in Figure 1, the blue economy method focused on the collaboration of economic aspects for development of the fisheries sector (Sari & Muslimah 2020). Several aspects should be taken into account toward a sustainable blue economy. The first aspect is associated with empowering the blue economy by improving technology and innovation which could improve efficiency in managing the fisheries sector by providing studies and development on the potential of marine resources. The second aspect is related to government policy to support the blue economy method, which is important to give direction for design strategy and implement efficiency. Therefore, government policy should be approved by legislative members, incorporating participation from the local community, to create regulations that support the blue economy method. Another important aspect is the empowerment of the local community. The participation of the community is crucial to ensure the sustainability of the blue economy program. Furthermore, the role of stakeholders is essential for promoting the blue economy. Stakeholders, including societies, governments, and non-government organisations, play a strategic role in maintaining ecological integrity and preventing the exploitation of marine resources.

According to Cisneros-Montemayor et al (2021), the blue economy method should consider the resources availability and enabling conditions, as shown in Figure 2. The resources availability dimension refers to bio prospect, blue carbon, development of ecotourism, abundance of fishers, and mariculture. Meanwhile, enabling conditions can be classified into social equity, environmental sustainability, and economic viability. For social equity, the blue economy should consider the issues of corruption and human rights, as well as economy, gender, and group equity. Another aspect should be considered for the blue economy method associated with environmental sustainability

where the issue of biodiversity, habitat, and water quality is becoming an important part of maintaining environmental sustainability. The final enabling condition for the blue economy relates to economic viability, which includes the availability of infrastructure, investment risk, and national stability.

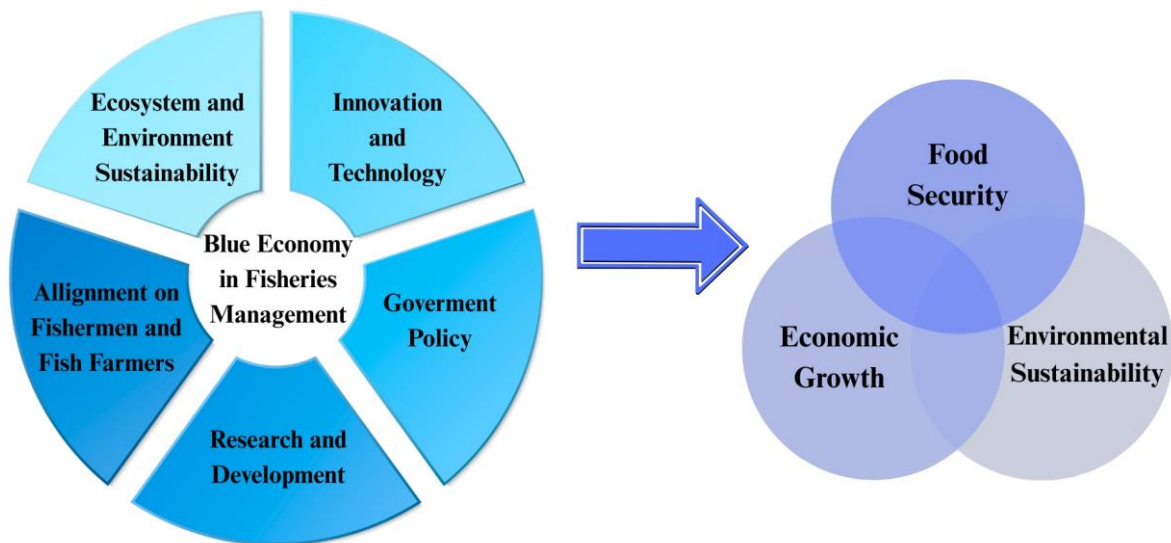


Figure 1. Blue economy integration model in sustainable fisheries management (Sari & Muslimah 2020).

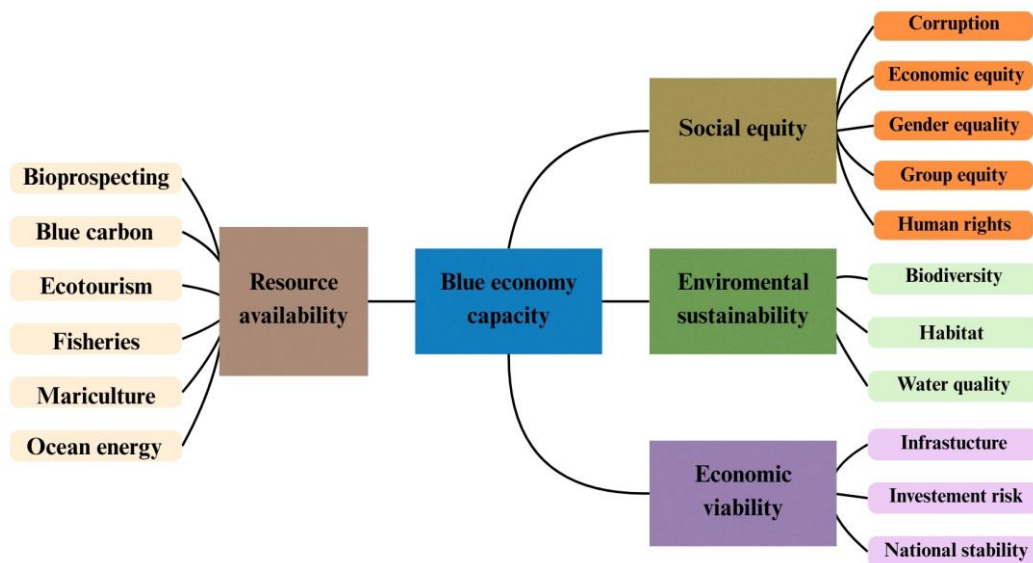


Figure 2. Dimensions and criteria used to evaluate the blue economy capacity (Cisneros-Montemayor et al 2021).

The blue economy can enhance fisheries traditional sector for local community in the coastal area. The issues of climate change and the delegation of marine-based resources are becoming major challenges for increasing economic industry activities. Therefore, the blue economy method is a potential alternative solution in integration for enhancing sustainable development and economic growth based on marine-based resources. The blue economy method can improve the welfare of the local community and also erode poverty through economic opportunity and using marine-based resources. By participating in the program, the local community will increase productivity in economic activity in fisheries sectors, thereby providing sustainable income.

A criticism of the blue economy is its association with the tenets of neoliberal capitalism, which can lead to the exploitation of marine natural resources. This argument

comes from the idea of a paradox between growth and sustainability. Karim (2024) argued that the blue economy tends to be "blue neo-colonialism" where many developed countries invest in developing countries and have little impact on the local economy. Meanwhile, Dix (2021) reported that blue neo-colonialism is associated with the extension of colonial practices, particularly economic and political control, through the exploitation of marine resources and the environment.

According to Rahman (2017), implementing the blue economy in developing countries poses several challenges, which can be categorized into environmental risks, poor governance, and unsustainable practices. Environmental risks include marine pollution, rising sea levels, and natural disasters. Poor governance is characterized by inadequate marine policy and ocean governance, overlapping policies, and a lack of trained personnel. Unsustainable practices refer to mismanagement and destructive fishing activities, such as illegal fishing, unplanned coastal development, and haphazard tourism.

The concept of the blue economy focuses on managing marine-based resources and maintaining the welfare of the local community in the long term. This concept is slightly different from the conventional economy model, which tends to exploit natural resources without considering the environmental impact. The blue economy provides a holistic method by addressing economic needs while considering social and environmental concerns (Brugère et al 2019). Furthermore, the scope of the blue economy covers the fisheries sector, ecotourism, wave energy, and aquaculture, aiming to optimize the use of marine resources economically while reducing the negative impact on the ecosystem.

The blue economy includes not only economic activities but also sustainable marine management, such as coral reef regeneration and mangrove planting. Mangroves protect species, prevent coastal abrasion, and serve as breeding grounds for fish, ensuring abundance (Fithor et al 2018). In developing countries, cultural values can play a crucial role in environmental protection (Çetiner & Yenilmez 2021). For example, in the eastern areas of Indonesia (Maluku and Papua), traditional laws "sasi" help conserve specific areas, such as marine reserves, by regulating exploitation within the local community (Sumarsono & Wasa 2019).

The objectives of the study include: (i) investigating economic aspect of the blue economy program in the area of Teluk Cenderawasih, (ii) examining the ecological factor, (iii) identifying the supply chain and job opportunities, and (iv) analyzing the policy of the local government toward blue economy in Teluk Cenderawasih.

Material and Method

Description of the study sites. The island of New Guinea, located in the easternmost part of Indonesia, is divided into several Indonesian provinces, including Papua and West Papua. West Papua Province lies on the western side of the island, facing the Pacific Ocean to the north, Australia to the south, and Maluku Islands to the west, while its eastern boundary borders Papua Province. Within this region lies the Teluk Cenderawasih National Park, situated along the northern coast of West Papua. According to WWF Indonesia (2019), the park encompasses diverse ecosystems such as coral reefs, coastal zones, mangrove forests, and tropical rainforests. The park's area comprises approximately 0.9% land and coastline, 3.8% mainland islands, 5.5% coral reefs, and 89.8% marine waters, hosting more than 150 coral species from 15 families.

The present study selected three areas, namely, the regencies of Biak Numfor, Nabire, and Manokwari, as shown in Figure 3. The study areas were selected due to the achievement of implementing the blue economy, as stated in the medium strategic plan document. Another reason for selecting the three regencies is the presence of Teluk Cenderawasih as part of the conservation zone in West Papua.

Biak Numfor is part of the Papua province, located in the north of Papua Island. The population in 2020 reached 120,000 inhabitants (BPS Biak Numfor 2023) and the GDP was 2.2% in 2023. Biak Numfor is surrounded by the sea, and the majority of inhabitants work in the agriculture sector as fishermen. This area is close to the Pacific Ocean, which translates to great potential for marine resources due to the abundance of

fish for increased economic growth. Many indigenous communities use traditional methods of catching fish. According to the Department of Fisher, about 30 tons of tuna fish were exported overseas in 2023 (Biak Numfor District's Fishery Office 2023).

Nabire Regency is located in the north of West Papua Island, sharing a border with the Yapen Regency in the north, Waropen, and Paniai Regency to the east, Dogiyai Regency to the south, as well as Kaimana and Teluk Wondama to the west. The population was estimated at 269,553 inhabitants and agriculture was reported as the dominant sector, contributing to about 46% of the total GDP (BPS Nabire 2023). The fishery sector is also important in the local economy due to many people working as fishermen. Nabire has interesting animals including whale sharks that attract many tourists to visit the regency.

Manokwari is situated in the West Papua Island, surrounded by the regency of Nabire in the east, Teluk Bintuni Regency in the north, Sorong in the west, and the Pacific Island in the south. The population was estimated at 201,821 inhabitants in 2023 (BPS Manokwari 2023) and the majority of people work in the agricultural sector, specifically those living on the mainland. However, the majority of people living in the coastal area work in the fishery sector.

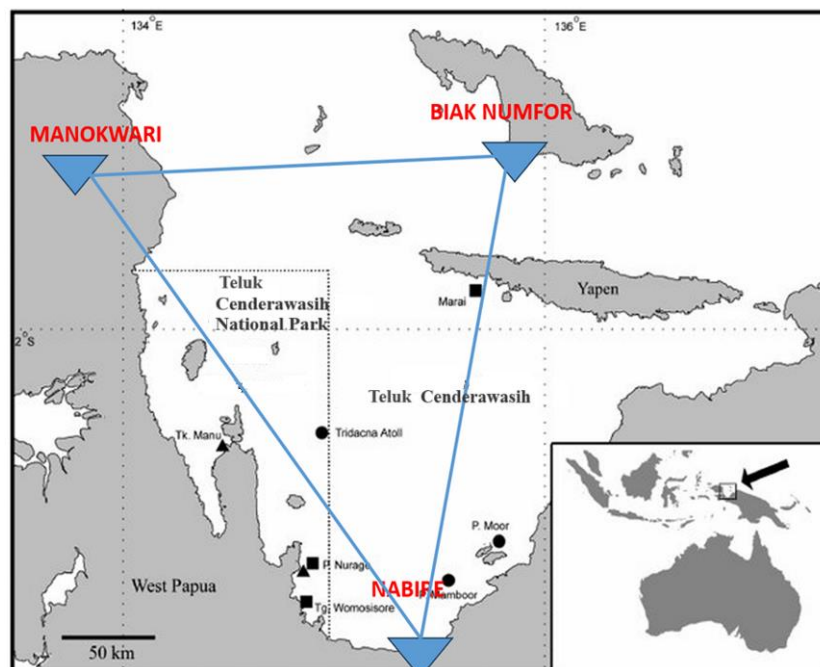


Figure 3. Study areas in Teluk Cenderawasih.

Data collections. To analyze the implementation of the blue economy in the selected regencies, data were collected from government sources (West Papuan local government or the central government of Indonesia). This study was divided into three sections under three main headings, namely preparation before the fieldwork, methodology, and fieldwork. The first section deals with the preparations for conducting fieldwork in Biak Numfor, Nabire, and Manokwari regencies. The processes included the preparation of instruments (questionnaires), conducting pilot projects, and obtaining letters of permission from specific institutions in West Papua. The second section explored the methodology, showing how the primary and secondary data were collected. This section also describes the selection of study locations and respondents, data collection and analysis, as well as the limitations. The third and last section examines the experience gained from conducting the field study.

Survey data were obtained from face-to-face interviews with respondents using questionnaires. Generally, surveys are important to generate information about personal and economic-social facts, as well as the environmental and cultural values of the local community. Lohr (2021) noted that surveys are useful to describe the nature of the

whole population with careful selection of probability samples. In this study, surveys were used to obtain the socio-demographic and economic status data of the respondents. Information about the ecological impact of the three regencies in Teluk Cenderawasih area was also obtained.

The three-stage sample selection process included (i) random selection of a sub-district (or its urban equivalent) from the rural and urban area of each regency, (ii) random selection of a village (or its urban equivalent) from each of the selected sub-districts (or urban equivalent), and (iii) systematic selection of households with a sample size of 374 from the three regencies. The selected respondents were asked to answer questions from the questionnaire in face-to-face interviews, with each section completed in no more than 30 minutes. The interview was conducted along with five trained interviewers. The questionnaires were developed in a manner and format appropriate to the age group of the respondents. All the interviewers were conversant in Bahasa Indonesia and the local language of West Papua. Therefore, there were no language or translation problems while interviewing the respondents.

All data was collected through surveys in Biak Numfor, Nabire, and Manokwari regencies. The total number of respondents in this study was 374 local people working in the fisheries sector and information from the questionnaires was used to address the study objectives.

Statistical analysis. A cross-tabulation table was used to analyze the pattern of economic, social, and environmental aspects of fishermen in the three regencies. Income households were also used to invert the average income.

Results and Discussion

Overview of study site. The majority of the data for the analysis was obtained from fieldwork in the three selected regencies from February to August 2024. Table 1 shows the distribution of samples in the five regencies.

Table 1
Distribution of respondents in the field study

No.	Regency	Sub-regencies	Total respondents	Percentage (%)
1.	Biak Numfor	North Biak District	58	15.5
		West Biak District	59	15.8
		<i>n</i>	117	31.3
2.	Nabire	Teluk Kimi District	67	17.9
		Nabire City District	65	17.4
		<i>n</i>	132	35.3
3.	Manokwari	East Manokwari District	64	17.1
		South Manokwari District	61	16.3
		<i>n</i>	125	33.4
		Total	374	100

Among the total of 374 respondents, approximately 31.3%, 35.3%, and 33.4% were from Biak Numfor, Nabire, and Manokwari Regencies, respectively. Within these regencies, the distribution by sub-regency was relatively balanced: North Biak and West Biak each accounted for about 17% of respondents in Biak Numfor; Teluk Kimi and Nabire City each represented around 16% in Nabire; while East Manokwari and South Manokwari contributed about 17% and 16%, respectively, in Manokwari Regency.

The distribution of respondents indicated that most participants were within the productive age group. Specifically, 33.7% of respondents were aged between 18 and 34 years, 37.7% were between 35 and 54 years, and 28.6% were aged 55 years and above. This shows that the majority of respondents were economically active adults, representing the main workforce involved in fisheries and coastal activities in the study area.

Table 2

Distribution of respondents classified by age (n = 374)

Regencies	Sub-regencies	Age						Total
		18-34	%	35-54	%	55>	%	
Biak Numfor	North Biak District	20	34.5	23	39.6	15	25.9	100
	West Biak District	19	32.2	23	39.0	17	28.8	100
Nabire	Teluk Kimi District	23	34.3	25	37.3	19	28.4	100
	Nabire City District	22	33.8	23	35.4	20	30.8	100
Manokwari	East Manokwari District	22	34.4	25	39.0	17	26.6	100
	South Manokwari District	20	32.8	22	36.1	19	31.1	100
	N (%)		33.7		37.7		28.6	100
	Total	126		141		107		374

The data from this study were collected in several places in Biak Numfor, Manokwari, and Nabire. In addition to conducting face-to-face interviews with local fishermen, the study also carried out focus group discussions (FGD) with stakeholders, such as local government, ethnic leaders, NGOs, and members of church foundations. The FGD is needed to obtain comprehensive information regarding the implantation of the blue economy, as well as the issues and challenges of adopting the blue economy method to the local community in Teluk Cenderawasih area.

Economic impacts of the blue economy on coastal communities. The implementation of the blue economy in Biak Numfor, Nabire, and Manokwari Regencies has generated tangible economic benefits for local communities. Many respondents reported improved income levels and greater participation in blue economy programs supported by local governments. In this study, respondents were asked to assess their understanding of the economic implications of the blue economy.

As shown in Table 3, there is a clear connection between the blue economy program and local community welfare, particularly through the diversification of fish products and enhanced productivity. Overall, among the 374 respondents' perceptions across the three regencies, approximately 48.7% agreed that the blue economy enables communities to create new economic opportunities using marine resources, while about 37.7% reported no significant economic impact. A closer examination revealed that respondents in Biak Numfor and Nabire largely viewed the blue economy as beneficial, whereas opinions in Manokwari were more evenly divided.

Table 3

Aspect of economy from blue economy

Respondents' perceptions	Biak Numfor		Nabire		Manokwari		Total	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Disagreed	33	26.8	58	44.6	50	41.3	141	37.7
Neutral	20	16.3	10	7.7	21	17.4	51	13.6
Agreed	70	56.9	62	47.7	50	41.3	182	48.7
Total	123	100	130	100	121	100	374	100

A cooperative was organized by the Christian Church Foundation (Sinode), for the local community in Biak Numfor, which played a crucial role in buying fish from the local fishermen and selling to the fisher company. The majority of fish often caught was tuna and through the cooperative, the local fishermen derive income by selling. To improve productivity, the local government of Biak Numfor supported the blue economy program by providing long boats to local fishermen. The Secretary of the Department of Fisheries

stated that “the local government provided 10 long boats to the local fishermen members of Syallom cooperative”.

The study found a significant number of respondents in Biak Numfor who reported that the blue economy decreased the income. This was particularly evident when the government's introduction of the blue economy program was not accompanied by adequate supervision from local authorities, contributing to the program's unsustainability due to lack of support. In the West Biak District, the discontinuation of the program hindered business development.

In Nabire, the blue economy program was implemented in tourism development. As part of Teluk Cenderawasih area, Nabire has interesting places to visit including beautiful beaches, and a variety of fish species. Whale sharks are becoming a famous tourist attraction on surrounding beaches. The local government has established the Whale-Shark Center (WSC) to collaborate with the local community who work as tour guides, provide souvenirs, and sell local food. Therefore, the local community receives income by participating in the blue economy program. Meanwhile, several respondents argued that the blue economy program delivered by the government had no impact on economy. Lack of support from the local government specifically the provision of kiosks for selling souvenirs and fish affected economy. Poor market infrastructure also contributed to the improper implementation of the blue economy.

An interesting result in Manokwari was the innovation and diversification of products from tuna waste generated by a company operating in the area. Tuna waste was transformed into restaurant menu items, attracting local visitors and becoming a tourist icon. Additionally, during harvest seasons, the abundance of fish stock enabled the creation of diverse products such as smoked fish, abon (fish floss), crackers, and fish balls. One restaurant in Manokwari used tuna heads, typically considered waste, as a menu item sourced from a fishing company, thereby reducing waste and creating value-added products.

Besides the benefits of the blue economy program to local people in Manokwari, some argued that it had no impact on the economic situation. The main reason cited was the unsustainable nature of the local government's blue economy program, leading to widespread disappointment. For instance, the local government had promised to provide nets and boats to fishermen in the Manokwari Barat District but failed to fulfill this promise, disappointing the Papuan local community.

Marine-based resources sustainability. Managing marine-based resources sustainably is becoming a crucial issue for implementing the blue economy in Teluk Cenderawasih where there are abundant fish in the Biak Numfor, Nabire, and Manokwari regencies. Many local fishermen catch fish for consumption, and the rest are sold in the traditional markets around the area. The livelihood of the local community respects the environment by managing the sea wisely. This is important because the sea plays a crucial role in protecting the marine ecosystem. In this study, the respondents were questioned on the use of marine-based resources sustainably.

Table 4 presents the relationship between the blue economy program and the management of marine-based resources by local communities in the three regencies. Out of the total 374 respondents, 46.3% agreed that local communities utilize marine resources sustainably for their daily livelihood. On the other hand, about 41.7% reported that the local communities do not use marine resources sustainably. This pattern is also seen in the regencies of Biak Numfor and Nabire, where the majority of respondents agreed that local communities are adopting sustainable management of their marine-based resources.

There are several best practices implemented in the blue economy at Teluk Cenderawasih. This study found that in Biak Numfor regency, the local community was using traditional methods for catching fish. Local fishermen often use *rumpon*, a traditional fishing device made from bamboo and coconut leaves that functions as an artificial fish aggregating structure. This method reflects a sustainable approach that aligns with Papuan cultural values emphasizing harmony with nature. The Papuan people hold deep respect for their forests, which they regard as “our mother”, a source of life

and livelihood. Mangrove forests, in particular, play a vital role in protecting coastal areas from waves and erosion while serving as breeding grounds for various species such as crabs, which are commonly caught and sold by local communities in traditional markets across Biak (Mollet & Silo 2024).

Table 4

Sustainable utilization of marine-based resources

<i>Respondents' perceptions</i>	<i>Biak Numfor</i>		<i>Nabire</i>		<i>Manokwari</i>		<i>Total</i>	
	<i>Frequency</i>	<i>Valid %</i>	<i>Frequency</i>	<i>Valid %</i>	<i>Frequency</i>	<i>Valid %</i>	<i>Frequency</i>	<i>Valid %</i>
Disagreed	42	34.2	57	43.8	57	47.1	156	41.7
Neutral	18	14.6	13	10.0	14	11.6	45	12.0
Agreed	63	51.2	60	46.2	50	41.3	173	46.3
Total	123	100	130	100	121	100	374	100

In Nabire, mangroves play a crucial role in the daily lives of the local community residing in coastal areas. The local community derive benefits from mangrove forests by producing cakes from mangrove fruits, exemplifying product diversification under the blue economy program. Mangroves provide shelter for fauna such as prawns, fish, and crabs, serving as a source of food and marketable commodities. Marine-based resources thus form a vital component of the local livelihood in Nabire.

Development of various blue economy potentials is not only focused on managing marine resources but also coastal area resources, including beaches and mangrove forests. In Manokwari, an interesting result was the local community's construction of deep-sea fish breeding enclosures. At Mansinam Beach Hotel, fish are cultivated using this method, and the hotel's fresh seafood attracts both locals and tourists, who frequently dine there, enjoying the freshly harvested fish.

Several challenges were encountered in implementing the blue economy, particularly regarding the sustainability of marine-based resources in Teluk Cenderawasih. This study found that there was exploitation of natural resources by fish companies in Biak Numfor. According to the secretary of fisheries department, there are regulations governing fishing areas for companies and local people. For instance, the local fishermen have the authority to catch the fish beyond 7 miles from the coastal area. However, in practice, companies often encroach on local fishing grounds, exploiting resources with advanced technology and larger vessels. This has led to conflicts between companies and the local community, a major issue in Biak Numfor related to the blue economy.

Implementing the blue economy in Nabire faces challenges, particularly regarding water pollution. Many local people lack awareness about disposing of waste in the Kali Bobo River, which flows into the sea, with plastic waste being a major contributor. This pollution affects the health of beaches, fish, and mangroves, as the waste mixes with sediment and disrupts marine ecology in Nabire.

The implementation of the blue economy in Manokwari faced challenges because of the rising sea level. This is a phenomenon occurring due to global warming, resulting in increased temperatures, unpredictable weather patterns, and rising sea levels, thereby causing abrasion on beaches surrounding Manokwari. Many local people have been forced to move from the beach because of the rising sea level.

Ecological aspect and Papuan culture values. Ecology refers to the relationship between humans, the physical environment, plants, and animals. The concept of the blue economy is associated with the ecology of the environment. This will help the local community to manage natural resources, specifically in seas by adopting sustainable development. In Papuan community, cultural values play a significant role in shaping local wisdom for managing natural resources, including the sea. In Teluk Cenderawasih area, many local communities have successfully conserved the environment by adhering to cultural values. In this study, the respondents were questioned on ecological aspects and the adoption of local wisdom for implementing the blue economy.

Table 5 shows the relationship between ecological aspects and cultural values in implementing the blue economy. According to the table, out of the 374 respondents, approximately 46.3% agreed that local communities incorporate cultural values in the management of marine environments, particularly to support marine conservation and maintain ecological balance. Meanwhile, about 41.7% % disagreed that local communities integrate cultural values in managing marine resources. A closer examination of the data shows that the majority of respondents in Biak Numfor, Nabire, and Manokwari argued that local communities apply cultural values to maintain the marine ecology.

Table 5

Ecological aspects and cultural values

Respondents' perceptions	Biak Numfor		Nabire		Manokwari		Total	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
Disagreed	42	34.2	57	43.8	57	47.1	156	41.7
Neutral	18	14.6	13	10.0	14	11.6	45	12.0
Agreed	63	51.2	60	46.2	50	41.3	173	46.3
Total	123	100	130	100	121	100	374	100

Papua has a diversity of tribes, with over 261 tribal groups distributed across the highlands and the coastal lowland areas (Ananta et al 2016). Generally, Papuan tribes respect *adat* (traditional values) in daily activities. The concept of *adat* describes the cultural connection uniting the ethics and values of various Indonesian groups. *Adat* implies community harmony, family prosperity, environmental preservation, and land ownership organization (Mollet & Silo 2024).

Many Papuans adopted and considered "the local wisdom" for managing the environment, such as the sea and forests. There is also respect for the sea, known as *sasi* in the local wisdom. *Sasi* aims to protect the sea by using traditional regulation (*adat*) based on clan (*keret*). There are two kinds of *sasi* implementation in the Papua community, namely permanent and temporary. Permanent *sasi* is enforced in specific marine areas, while the temporary is implemented for a limited time, guided by *adat* cultural institutions. These institutions determine which fish species can be caught and at what specific time. *Sasi* incorporates a social-collective dimension, ensuring equitable distribution of benefits from natural resource management among community members.

The result of this study found that the majority of the local community adopted temporary *sasi* in Biak Numfor, Nabire, and Manokwari regencies. For example, on the island of Podaido, north of Biak regency, local people have contributed to conservation by applying *sasi* in areas prohibited from catching certain fish. In Nabire, *sasi* regulations prohibit local people from cutting down mangrove trees for firewood. In Manokwari's Mansinam, local people prohibit fishing in coastal areas due to a close relationship with the fish, which are fed by locals and have become a tourist attraction. However, the study found that the role of cultural values appears to be diminishing, particularly among young people. Several factors contribute to this decline, including urban migration for education, leading to disconnection from traditional cultural values upon return. Conflicts among ethnic leaders and *adat* institutions over decision-making and *sasi* location allocation have also played a role in maintaining the balance between ecological preservation and economic utilization. Despite these challenges, the majority of local people in Biak Numfor, Nabire, and Manokwari still believe in the enduring presence of local wisdom and cultural values within Papuan community.

Conclusions. This study provided valuable perspective on the local contexts related to implementing the blue economy program for supporting sustainable development in Teluk Cenderawasih area. The study aimed to investigate the implementation of the blue economy and its impact on several aspects of marine resources, as well as ecological and cultural values. This study was carried out in the regencies of Biak Numfor, Nabire, and Manokwari which were part of Teluk Cenderawasih National Park. The conclusion drawn

from the results showed that the blue economy had an impact on economy of the local community. The income of the local community was increased by participating in cooperatives and diversifying fish products, as well as contributing to tourist development. In addition, the local community adopted sustainable practices with the blue economy, using transitional fishing methods, such as rumpon and deep-sea sounding, while also protecting mangroves for fish breeding. This study also found that cultural values, specifically local wisdom (*sasi*), played a significant role in managing marine natural resources in Teluk Cenderawasih, with *adat* institutions responsible for protecting marine areas by prohibiting fishing in certain areas. However, several challenges to implementing the blue economy were identified, including a lack of support from local government, inadequate awareness among local community regarding plastic waste management, fish exploitation, conflicts between companies and local people, and disagreements among ethnic leaders on the determination of the *sasi* location.

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Conflict of interest. The authors declare that there is no conflict of interest.

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