
Integrating Local Wisdom and Policy Strategies for a Sustainable Blue Economy: The Case of Bengawan River Society in Bojonegoro City

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Abstract

The blue economy is a way of thinking about sustainable development that focuses on using water resources to boost the economy, promote health, and protect ecosystems. The Bengawan River is one of the longest rivers in Java. It is very important to the community's social and economic life, both through farming and fishing and through ecotourism. But pollution, environmental damage, and overexploitation have put the region's ecological and economic sustainability at risk. The Bengawan community, on the other hand, has local knowledge that has been passed down through the years about how to keep nature in balance. For example, they have a tradition of working together to clean the river and regulations about how to use water. This study seeks to evaluate the feasibility of incorporating indigenous knowledge into blue economy policy frameworks to attain ecological sustainability while enhancing the welfare of the Bengawan community. The research employs a qualitative methodology featuring descriptive analysis, collecting data through field observations, stakeholder interviews, and a literature evaluation pertaining to blue economy policy. The study's findings demonstrate that the local wisdom of the Bengawan community possesses ecological value consistent with the tenets of the blue economy; yet, it has not been effectively incorporated into government policy. This integration necessitates adaptable policy measures that incorporate community engagement, rules grounded in local values, and endorsement of sustainable empowerment initiatives. This study offers a conceptual contribution through a blue economy policy model rooted in local wisdom, alongside practical recommendations for local governments and stakeholders to ensure the sustainability of the Bengawan River in Bojonegoro.

Introduction

The blue economy has become an important model for sustainable development, especially when it comes to balancing economic growth with protecting aquatic habitats. The World Bank says that this idea is all about "using ocean resources in a way that is good for the economy, people's lives, and jobs, while also keeping marine ecosystems healthy (World Bank, 2017). In a global context, one methodological study asserts that the blue economy fosters a triple bottom line, specifically economic progress, social fairness, and environmental conservation, as the foundational principles for its execution (Wuwung et al., 2022).

In Indonesia, the utilization of the blue economy concept is gaining increasing attention. A study shows that the government began implementing this concept in national maritime and fisheries governance during the period 2017–2022, with the aim of effectively and responsibly utilizing resources for sustainable economic development (Fadhlillah, 2025). The research conducted by Yashinta also emphasizes the importance of sustainable fisheries resource management and inclusive benefit sharing as pillars of Indonesia's blue economy blueprint (Kumala et al., 2025).

Andre Danio's research looks on how the Blue Economy might help Indonesia's economy flourish, with a focus on managing marine resources in a way that is good for the environment. Marine biotechnology has a lot of promise for new products and technologies that could lead to innovation and economic prosperity. Environmentally friendly shipping helps the environment by shipping less, which supports bigger aims for sustainability. This study emphasizes the necessity of incorporating sustainable practices across diverse marine sectors to attain equilibrium between economic development and environmental preservation. This research's strength is that it looks at several different Blue Economy sectors and how they all affect the Indonesian economy. These findings enhance comprehension of the Blue Economy's potential and offer significant guidance for policymakers to devise strategies that foster sustainable development within the marine sector, thereby benefiting the economy, society, and the environment (Danio & Guntur Saputro, 2025).

In theory, the blue economy cannot be successfully executed without the involvement of local communities and the acknowledgment of indigenous knowledge. Research on global ocean governance shows that policies that include the expertise of indigenous and local communities have made sustainable ocean management work better in many nations, including Indonesia (Boesch, 1999).

Research in the subject of local environmental studies has demonstrated that indigenous knowledge significantly influences ecological sustainability; for instance, a study published in the journal *Sustainability* indicated that local values positively contribute to ecological conservation in Indonesia (Aldyan et al., 2024).

The Bengawan River is one of Java's primary rivers. It provides clean water, a way to get around, and a place for businesses to do things like farming, fishing, and ecotourism. Pollution, sedimentation, and unrestricted use, on the other hand, put the long-term health of the people near this river at risk. On the other hand, local communities have traditions that show ecological understanding, such working together to keep the river clean, following regulations for how to utilize water, and having ceremonies to celebrate nature. These traditions could help the blue economy.

In addition to being an economic resource, the Bengawan Solo River also holds socio-cultural values that are reflected in the local wisdom practices of the Bojonegoro community. Traditions such as sedekah bumi (earth alms), bersih desa (village cleaning), and nyadran kali (river cleaning) are not only spiritual and cultural expressions, but also serve as ecological mechanisms in maintaining the balance of nature. For example, river cleaning activities carried out through mutual cooperation have proven to be able to increase the collective awareness of the community regarding the importance of maintaining the quality of water and the Bengawan ecosystem.

The potential of this local wisdom is highly relevant as a basis for local government policies in promoting the implementation of the blue economy. Integrating local values into policies will strengthen social legitimacy, increase community participation, and ensure that sustainable development strategies are not merely based on top-down instructions but are also rooted in the awareness and practices of the community itself. Recent research confirms that public policies that accommodate local wisdom tend to be more effective because they are in line with the socio-cultural context of the communities affected by the policies (Rorato et al., 2022).

However, the main challenge that arises is how to formulate government policies that can accommodate local wisdom without reducing their economic value. Studies show that when environmental policies do not involve local knowledge, the risk of social resistance and implementation failure increases (Setyarini et al., 2021).

Therefore, this research is important to explore how blue economy policy strategies can be integrated with the local practices of the Bengawan community in Bojonegoro, thereby enabling inclusive, sustainable development based on local wisdom.

In light of this situation, this study seeks to develop policy options that amalgamate indigenous knowledge with blue economy concepts in the context of Bengawan communities. The fundamental idea is that incorporating local values into policy can make the environment more sustainable and improve the lives of those living along the Bengawan River.

Literature Review

Evolution of the concept and scope of "blue economy"

The idea of the blue economy started with the marine sector, but it has recently grown to include freshwater systems including rivers, lakes, and riparian areas because of the significant links between coastal and marine ecosystems. The most recent policy framework stresses the need for a cross-level territorial approach that brings together marine and freshwater economies to meet goals for water resilience and regional development (OECD, 2024).

In an archipelagic country like Indonesia, there is literature showing a shift from "ocean-based growth" toward a just and ecosystem-based blue economy, linking ecological, social, and cross-regional governance dimensions (Arief Setyanto et al., 2023).

Local Wisdom Theory (ILK) for Blue Economy Policy

Local wisdom is the knowledge, beliefs, norms, and practices that communities create over time via their interactions with their environment. In worldwide literature, the words Traditional Ecological Knowledge (TEK) or Indigenous & Local Knowledge (ILK) are often

used. TEK/ILK complements modern science with a holistic perspective, a history of long-term observation, and adaptive practices contextualized to specific landscapes and waters (Souther et al., 2023).

Theoretically, ILK is understood as part of biocultural diversity, which is the reciprocal relationship between biodiversity and culture that promotes ecosystem-based resource management while preserving community identity and rights. The latest biocultural classification emphasizes the importance of intangible components (values, worldview, local knowledge) in conservation and development decisions (Otamendi-Urroz et al., n.d.).

Policy Strategies Theory

Policy strategies are conceptual frameworks designed to guide decision-making and actions in achieving specific development goals. In the context of sustainable development, policy strategies are not only oriented towards economic growth, but also take into account social, cultural and ecological aspects in order to create long-term balance (Howlett & Ramesh, 2014). Effective policy strategies typically include formulation, implementation, evaluation, and adaptation to social and environmental dynamics.

According to (Dunn, 2017), policy strategy is a systematic process of formulating policy alternatives based on rational analysis and socio-cultural context to produce solutions to public issues. Meanwhile, (Peters, 2005) emphasises that policy strategies need to be designed with consideration for the involvement of key actors, including local communities, in order to ensure their legitimacy and sustainability.

In the context of the blue economy, policy strategies must be able to integrate sustainability principles with community-based resource management. This is in line with the view that public policy cannot be separated from local wisdom and community participation, as these factors play a role in ensuring policy implementation is in accordance with the values and norms that apply at the local level (Leal Filho et al., 2021).

In addition, policy strategy theory also emphasises the importance of policy coherence or alignment between sectors, as sectoral policies tend to cause overlap and conflicts of interest (Nilsson et al., 2016). Therefore, policy strategies in support of the blue economy need to place cross-sectoral coordination and multi-stakeholder collaboration as key principles.

Research Methods

This study employs a qualitative approach with a case study design. This approach was chosen because it is capable of exploring in depth the social, cultural, and economic phenomena developing in the communities around the Bengawan River in Bojonegoro, particularly in relation to the integration of local wisdom into river management policy strategies and sustainable blue economy. The case study is considered relevant because the Bengawan Solo River is both an ecosystem and a living space with unique dynamics, both in terms of ecology and the socio-cultural practices of the local community.

According to (Sugiyono, 2021), qualitative research is used to understand social phenomena holistically, by describing them in words and language, in a specific natural context and utilising various scientific methods (Sugiyono, 2021).

The research location was set in the community around Bengawan, focusing on socio-economic

interaction patterns and local wisdom values in supporting sustainable blue economy policies.

The research location was set in the area around the Bengawan Solo River that flows through Bojonegoro Regency. This area was chosen because it has close ties to the lives of the local community, both in social, cultural and economic aspects, and faces environmental sustainability challenges due to river ecosystem degradation.

Informants were selected using purposive sampling, which is the selection of informants based on specific criteria, namely those who are considered to have the best understanding of the issues being studied. Informants consisted of community leaders, fishing group managers, village officials, relevant local government officials (e.g. from the Environment and Fisheries Agency), and representatives of NGOs or academics focusing on environmental issues. This technique is in line with (Sugiyono, 2021) view that qualitative researchers must select data sources that are most knowledgeable and reliable.

Data collection was carried out using four main techniques: observation, in-depth interviews, documentation, and triangulation. Observation was conducted by directly observing community activities in utilising Bengawan resources. In-depth interviews were used to explore informants' perspectives and experiences regarding local wisdom and expectations for blue economy policy strategies. Documentation included the collection of secondary data in the form of regional policies, records of community activities, and village archives. Meanwhile, triangulation was used to test the credibility of the data by comparing the results from various sources.

Data analysis was conducted following the interactive model of Miles & Huberman, adapted by Sugiyono, through the following stages: data reduction, which involves summarising and selecting key data; data presentation, which involves compiling information in the form of descriptive narratives and tables; and conclusion/verification, which involves searching for patterns, meanings, and connections between data to arrive at a final conclusion (Ridder et al., 2014).

Result and Discussion

Based on data collection through observation, in-depth interviews, and documentation, several key findings were obtained regarding sustainable blue economy policy strategies in the Bengawan Bojonegoro community:

Ecological and Social Conditions

Field observations show that the water quality of the Bengawan Solo River at several points has degraded, marked by increased turbidity and pollution from household and small industrial waste. However, the community still depends on the river for their livelihoods, whether through irrigated agriculture, freshwater fishing, or trading activities.

The Role of Local Wisdom

Interviews revealed the existence of local wisdom traditions, such as sedekah bumi (earth alms) and bersih sungai (river cleaning), which contain ecological values in preserving nature. However, these practices are beginning to fade due to changes in lifestyle and a lack of government policy support.

Government and Stakeholder Involvement

Government policies related to river management are still partial, focusing on technical aspects such as sediment dredging, without integrating local wisdom. The results of the above study indicate that the sustainability of the blue economy in the Bengawan community is determined not only by ecological factors, but also by the integration of cultural values and local wisdom. This is in line with the theory of local wisdom integration, which states that the success of environmental policies requires social legitimacy from the community (Rahman et al., 2022).

Why do research findings indicate low community participation? One reason is that the policies implemented are top-down, whereby the community is merely the object of the programme rather than a subject involved in its formulation. In fact, literature shows that policies involving active community participation tend to be more successful in the long term (Moriguchi, 2021).

wisdom such as sedekah bumi (earth alms) and bersih sungai (river cleaning) which are beginning to fade also indicate the challenges of modernisation. If these values are not integrated into formal policies, they will disappear along with social change. These findings reinforce the argument that blue economy policy strategies cannot be purely technocratic, but must accommodate socio-cultural dimensions (Irvine, 2018).

Conclusion

This study shows that efforts to implement sustainable blue economy policy strategies in the Bengawan community, particularly in Bojonegoro, still face a number of fundamental challenges. First, the ecological condition of the Bengawan Solo River has deteriorated due to pollution from household waste and small industries, thereby affecting the carrying capacity of the environment as the basis of the community's economy. Second, local wisdom such as the traditions of sedekah bumi (earth alms) and bersih sungai (river cleaning), which have ecological value, are beginning to fade due to a lack of attention in formal policies and institutional support. Third, the level of community participation in decision-making is still low, so that top-down policies lack social legitimacy.

These findings confirm that the success of the blue economy in Bojonegoro cannot be achieved through technical approaches alone, but requires the integration of formal policies, community participation, and local wisdom. The Bojonegoro regional government needs to formulate a collaborative strategy that involves all stakeholders, including the community, academics, and the private sector, so that the resulting policies not only preserve the Bengawan River but also strengthen the cultural identity of the local community.

Thus, the model of blue economy policy based on local wisdom in Bojonegoro can serve as a best practice example for other regions in Indonesia in developing sustainable development rooted in local potential.

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