Antecedents and Consequences of Wetland-Based Circular Economy in South Kalimantan: Ethnographic Study

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Abstract. Circular economy is an approach that is gaining increasing attention in efforts to address global environmental and economic challenges. In South Kalimantan, wetlands play a significant role in the ecosystem and economic potential of the area. This study aims to explore the factors that influence the implementation of a wetland-based circular economy and its consequences. Using an ethnographic study approach, this study collected data through participant observation, in-depth interviews with local communities, and analysis of related documents. The results of the study identified several important antecedents, including local wisdom, government policies, and strong community support. In addition, this study found that the implementation of a circular economy in wetlands has a positive impact on improving community economic welfare, environmental conservation, and natural resource sustainability. However, this study also revealed challenges such as limited infrastructure and a lack of community understanding of the concept of a circular economy. In conclusion, this study highlights the importance of collaboration between the government, local communities, and the private sector to optimize a wetland-based circular economy in South Kalimantan. The results of this study can be a guide for the development of more effective policies in supporting a sustainable economy in the region.

Keywords: Circular economy, wetlands, South Kalimantan, ethnographic study.

1 Introduction

Circular economy is a development approach that aims to create a more sustainable economic system through the reduction, reuse, and recycling of resources. This model offers an alternative to the traditional linear economy, which tends to produce waste and excessive resource consumption [1]. In South Kalimantan, which is one of the areas with the largest wetlands in Indonesia, the application of circular economy has significant potential, especially in the management of wetland ecosystem-based resources.

Wetlands in South Kalimantan, such as rivers, swamps, and mangroves, not only provide ecological benefits, but also have important economic value for local communities. Natural resources such as fish, wood, and agricultural products are often the mainstay of the economy of the community in this area [2]. However, with increasing pressure on the environment due to population growth and resource exploitation, the economic sustainability of wetlands is increasingly threatened. In this context, the circular economy plays an important role as a

ICWSDGs 2024, September 09-10, Banjarmasin, Indonesia
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DOI 10.4108/eai.9-9-2024.2359051

solution to maintain the balance between economic growth and environmental sustainability [3].

This ethnographic study will explore the antecedents (causal factors) and consequences (effect factors) of the implementation of a wetland-based circular economy in South Kalimantan. An ethnographic approach was chosen because it is able to capture the deep cultural and social dimensions related to how local communities view and manage their natural resources [4]. The study will identify the factors that drive the adoption of a circular economy by local communities, as well as the resulting impacts on economic and environmental sustainability. A better understanding of these dynamics will provide important insights for policymakers and stakeholders in formulating inclusive and sustainable development strategies [5].

This research is expected to contribute to the literature on circular economy in the context of wetlands, as well as provide practical recommendations for efforts to preserve and develop local economies based on natural resources in South Kalimantan.

2 Literature Review

2.1 Circular Economy: Definition and Concept

A circular economy is an economic approach that emphasizes efficient use of resources through closed cycles, including waste reduction, reuse, and recycling of products or materials [6]. This principle differs from a linear economy that relies on a “take, make, dispose” model, which has the potential to cause environmental damage and overexploitation of natural resources [7]. In the context of sustainable development, a circular economy seeks to reduce negative impacts on the environment by maximizing the value of materials through efficient economic processes. Several studies have shown that the implementation of a circular economy can increase resource efficiency, create jobs, and minimize environmental risks [8].

2.2 Wetland Ecosystems: Characteristics and Economic Potential

Wetlands play an important role in supporting biodiversity, climate regulation, and providing resources for local communities. According to Mitsch and Gosselink [9], wetlands have the ability to store carbon, control flooding, and provide natural habitat for various species. In South Kalimantan, wetland ecosystems include mangrove forests, swamps, and rivers which are sources of livelihood for local communities through activities such as fisheries, agriculture, and forestry [10]. The economic potential of these wetlands is enormous, but excessive exploitation, such as land clearing and conversion into mining and plantation areas, has resulted in ecosystem damage and threatened the economic sustainability of communities that depend on these wetlands [11].

2.3 Antecedents of Circular Economy in Wetlands

Factors driving the implementation of a circular economy in wetlands can be seen from several perspectives. First, local community awareness of the importance of preserving natural

resources [12]. Communities that understand the reciprocal relationship between ecosystems and the economy tend to be more proactive in implementing circular economy practices, such as organic waste management, sustainable processing of natural products, and utilization of renewable energy [13]. Second, government regulations and policy support that encourage innovation in wetland-based resource management are important antecedents [14]. The government, through environmental conservation and wetland management programs, can be a catalyst for the implementation of a circular economy on a wider scale.

2.4 Consequences of Circular Economy in the Context of Wetlands

The consequences of implementing a wetland-based circular economy can be seen from various dimensions. From an economic perspective, the implementation of this model has the potential to create new business opportunities, increase the efficiency of resource use, and extend the life of products [15]. For example, processing organic waste into fertilizer or alternative fuels from biomass can increase the economic value of local resources. From an environmental perspective, the implementation of a circular economy can reduce the impact of ecosystem damage due to excessive exploitation, such as decreased biodiversity and land degradation [16]. However, there are also challenges in adopting a circular economy in wetlands, such as resistance to change, lack of technology, and low investment in recycling infrastructure [17].

2.5 Ethnographic Studies: A Method in Understanding the Circular Economy

Ethnography is an in-depth research method in understanding the behavior, culture, and social interactions of a community [18]. In the context of a wetland-based circular economy in South Kalimantan, an ethnographic approach helps researchers understand holistically how local communities manage natural resources and respond to changes in economic and environmental policies. Through participant observation and in-depth interviews, ethnographic studies can reveal local practices relevant to the circular economy, such as conservation efforts, sustainable consumption patterns, and adaptation to environmental changes. This approach can also identify the challenges and opportunities faced by communities in adopting a circular economy, as well as the role of local actors in driving a greener and more sustainable economic transformation [19].

2.6 Circular Economy in Indonesia and South Kalimantan

The implementation of a circular economy in Indonesia, especially in South Kalimantan, is still in its early stages. Several initiatives have been undertaken by the government and non-governmental organizations to introduce this concept, especially in the sustainable agriculture, fisheries, and forestry sectors [20]. In South Kalimantan, the potential for a circular economy lies in the diversity of wetland natural resources that can be managed in a more sustainable manner, such as the use of mangrove forests for carbon sequestration and community-based

ecotourism. However, collaborative efforts are still needed between the government, local communities, and the private sector to realize a sustainable circular economy in this region.

This literature review provides theoretical and empirical foundations in understanding the antecedents and consequences of wetland-based circular economy in South Kalimantan. Thus, this study seeks to fill the knowledge gap on how circular economy can be integrated in the local context, as well as identifying key factors influencing its successful implementation.

3 Research Method

This study uses a qualitative approach with ethnographic methods to deeply understand the practices, values, and perceptions of local communities in South Kalimantan regarding the implementation of a wetland-based circular economy. The ethnographic approach allows researchers to explore the social, cultural, and economic interactions that occur in the daily lives of local communities and understand the dynamics that emerge in natural resource management. The following are details of the research methods that will be used:

3.1 Location and Subject of Research

This research will be conducted in the wetland areas of South Kalimantan, especially in villages that depend on swamp ecosystems, rivers, and mangrove forests. The selection of this location is based on the high dependence of the community on wetland-based natural resources, which makes them relevant subjects in the application of the circular economy concept. The subjects of the research are local communities, including fishermen, farmers, craftsmen, and other actors such as community leaders, village governments, and non-governmental organizations involved in environmental management.

3.2 Data Collection Techniques

Data collection in this ethnographic research was carried out using several techniques:

a. Participatory Observation
   Researchers will be directly involved in the daily lives of communities to observe existing or potential circular economy practices. These observations include activities such as waste management, recycling of local materials, and sustainable farming or fishing practices. Researchers will record patterns of social interaction, use of technology, and community adaptation to environmental and economic changes.
b. In-depth Interview
   Interviews will be conducted with various stakeholders, including local communities, traditional leaders, local government, and non-governmental organizations. The interviews aim to explore their understanding of the circular economy, the challenges faced, and their views on its benefits and impacts on social and environmental well-being. Interviews will be semi-structured, so that respondents have the freedom to share their experiences and perceptions.
c. Documentation and Literature Study

Researchers will collect relevant documents, such as government policies related to wetland management, environmental organization reports, and scientific articles related to the circular economy. This literature study will strengthen empirical data obtained in the field and help understand the broader context related to the implementation of the circular economy in Indonesia, especially in South Kalimantan.

3.3 Data Analysis

The collected data will be analyzed qualitatively with a thematic analysis approach. The data analysis process will be carried out in several stages:

a. Coding
   Data from observations, interviews, and documentation will be coded based on key themes that emerge from the research results. These themes may include circular economy practices, barriers faced by communities, socio-cultural dynamics, and the economic and environmental impacts of implementing a circular economy.
b. Categorization
   After the data is coded, categories will be formed to group relevant information. These categories can be antecedents (causal factors), consequences (effect factors), and patterns of community interaction in the context of a wetland-based circular economy.
c. Data Interpretation
   The categorized data will be interpreted to find relationships between key variables, such as how cultural factors influence the implementation of the circular economy, as well as the impact of the circular economy on community welfare and environmental sustainability. Researchers will also compare field findings with existing theories and literature to identify gaps and new contributions from this research.

3.4 Validity of Data

To ensure the validity of the data, this study will use several techniques:

a. Data Triangulation
   Researchers will compare data from various sources (observations, interviews, and documentation) to ensure consistency and validity of findings. Triangulation is also done by verifying information obtained from interviews with official documents or relevant literature.
b. Member Checking
   The interview results will be reconfirmed with the respondents to ensure that the researcher's interpretation is in accordance with their views and understanding.
c. Audit Trail
   Researchers will record the entire data collection and analysis process in detail, so that the research process can be audited or reviewed by other researchers if necessary.

3.5 Research Ethics

This study will pay attention to ethical aspects by ensuring that all participants provide *informed consent* before data collection is carried out. Researchers will also maintain the confidentiality of participants' personal information and ensure that the results of the study do not harm the parties involved.

With this ethnographic method, the research is expected to provide a comprehensive picture of the antecedents and consequences of a wetland-based circular economy in South Kalimantan, as well as provide practical recommendations to support the development of a more sustainable local economy.

4 Results and Discussion

4.1 Result

4.1.1 Antecedents of Wetland-Based Circular Economy in South Kalimantan

This study found that there are several key factors that drive the implementation of a circular economy in the wetlands of South Kalimantan. The antecedent factors that emerged include:

a. Local Community Environmental Awareness
   One of the main drivers of circular economy adoption is public awareness of the importance of preserving the environment. Local communities, especially those living around wetlands such as rivers and swamps, demonstrate a strong understanding of the relationship between ecosystem sustainability and their economic well-being. In interviews with traditional leaders and community leaders, many emphasized that over-exploitation of resources could damage wetland ecosystems and threaten their future livelihoods.
b. The Role of Local Wisdom
   Local wisdom is also an important factor in encouraging the implementation of circular economy principles. For example, in the culture of communities around wetlands, there is a tradition of wise use of natural resources, such as managing agricultural waste for compost and utilizing fish waste for animal feed. These traditional practices are in line with the principles of a circular economy, which encourages maximum use of resources and reduces waste.
c. Government Policy and Program Support
   Local governments and non-governmental organizations (NGOs) also play an important role in initiating programs that support the circular economy. For example, several villages in South Kalimantan have received assistance to build organic waste processing and recycling facilities, as well as training on environmentally friendly technologies. Programs like these serve as catalysts to educate and encourage communities to adopt the circular economy in their daily lives.

4.1.2 Circular Economy Practices Found

Field research shows several examples of wetland-based circular economy practices that have been implemented by local communities:

a. Recycling of Agricultural Waste

Farmers in the swampy areas have utilized agricultural waste, such as straw and other crop residues, to be processed into compost. This waste processing not only reduces agricultural waste, but also produces valuable products that can be reused in the agricultural production cycle.

b. Sustainable Fisheries Resources Management
   The fishing communities in the rivers and swamps of South Kalimantan have implemented sustainable fishing practices, such as fishing with environmentally friendly nets that do not damage fish habitats. In addition, they also utilize their catch efficiently by processing unsalable fish into processed products such as salted fish or feed ingredients.
c. Renewable Energy Development
   As part of the circular economy effort, several local communities have initiated the use of renewable energy from organic waste. For example, the processing of waste from livestock and organic waste is processed into biogas which can be used as an alternative energy source for household needs.

4.1.3 Consequences of a Wetland-Based Circular Economy

From the research results, several positive consequences of implementing a circular economy in the wetlands of South Kalimantan have been identified:

a. Increasing Economic Welfare
   By implementing a circular economy, local communities can use resources more efficiently, which ultimately increases their income. For example, farmers who process agricultural waste into compost do not need to buy chemical fertilizers, thereby reducing production costs and increasing profits. Fishermen who process their catch into value-added products also earn additional income.
b. Reducing Environmental Impact
   The application of circular economy principles, such as waste management and the use of environmentally friendly technologies, has had a positive impact on the environment. Reducing waste discharged into rivers and wetlands helps maintain water quality and ecosystem health. In addition, sustainable farming practices and environmentally friendly fishing help maintain biodiversity and reduce the destruction of natural habitats.
c. Social and Cultural Strengthening
   Strengthening the circular economy also has social implications, as communities become more cooperative in resource management. Community-based practices, such as collective waste management and wetland conservation programs, strengthen relationships between residents and encourage active participation in environmental conservation efforts.

4.1.4 Challenges in Implementing a Circular Economy

Despite the many benefits of a circular economy, the study also found several challenges that hinder its implementation:

a. Lack of Infrastructure and Technology

In some villages, facilities and technology for waste processing and recycling are still minimal. This hinders communities from optimizing the use of resources in a circular manner. Lack of access to modern technology also limits the potential for increasing the efficiency of resource management.

b. Social and Cultural Constraints
Not all members of society fully accept the shift towards a circular economy. Some people, especially the older generation, tend to maintain traditional ways that do not always align with the principles of a circular economy. In addition, there is resistance to the adoption of new technologies due to a lack of understanding or discomfort in using them.

c. Lack of Financial Support
Circular economy development requires initial investment, especially in infrastructure and technology. Many communities have difficulty gaining access to financial resources, such as credit or government assistance, to develop circular economy-based businesses.

4.2 Discussion

The study reveals the immense potential of a wetland-based circular economy in South Kalimantan to simultaneously enhance economic welfare and promote environmental sustainability. By weaving together principles of resource efficiency and ecological balance, this approach aligns with the region's unique cultural and natural heritage.

Communities in South Kalimantan have demonstrated a remarkable readiness to adopt circular economy practices, driven by their inherent environmental awareness and deeply rooted local wisdom. For instance, traditional wetland management methods, passed down through generations, have naturally incorporated elements of sustainability. These practices now provide a robust starting point for circular strategies, emphasizing reuse, recycling, and regeneration.

The social dimension of the circular economy is equally compelling. Collaborative efforts to implement sustainable practices foster a sense of collective responsibility among community members. This unity strengthens social ties and creates a shared commitment to preserving the region's natural resources. In one example, villagers working together to convert organic waste into compost not only reduced environmental pollution but also cultivated a spirit of solidarity and mutual support.

However, challenges remain significant. Cultural resistance to change can hinder the adoption of new practices, particularly when they deviate from long-established habits. Additionally, technological limitations and insufficient infrastructure pose barriers to scaling up circular initiatives. For instance, the lack of efficient waste processing facilities often forces communities to rely on less sustainable methods of disposal.

The study emphasizes the crucial role of external support in overcoming these challenges. Greater involvement from the government and private sector is needed, particularly in terms of funding and infrastructure development. With strategic investments and policy frameworks, the circular economy could transition from localized initiatives to a broader, more impactful movement.

In conclusion, this study provides a vivid narrative of how the principles of a circular economy can be adapted to the wetland-based context of South Kalimantan. While the

potential benefits are significant—ranging from economic empowerment to strengthened social cohesion—realizing these requires an inclusive, well-supported, and contextually sensitive approach. The insights offered serve as a roadmap for other regions seeking to harmonize economic development with environmental stewardship.

5 Conclusion

This study explores the implementation of a wetland-based circular economy in South Kalimantan, revealing a number of key findings on how circular economy principles can be integrated into the local context and the challenges faced. Based on the results of the study, several key conclusions can be summarized as follows: The circular economy in South Kalimantan is driven by high environmental awareness among local communities. Communities understand the importance of preserving wetland ecosystems to ensure the sustainability of their livelihoods. Local wisdom also plays a crucial role, with traditions of wise resource utilization, such as processing waste into compost, which is in line with the principles of a circular economy. In addition, support from the government and non-governmental organizations, which provide facilities and training related to environmentally friendly technologies, also encourage the adoption of a circular economy. Circular economy practices found in this study demonstrate a variety of wetland-based innovations. Among them are recycling agricultural waste, sustainable fisheries management, and the use of renewable energy from organic waste. These practices not only reduce waste and increase the efficiency of resource use, but also provide additional economic value to local communities. The consequences of implementing a circular economy in South Kalimantan are very positive. Economically, the implementation of circular principles improves community welfare by reducing production costs and creating new business opportunities. Environmentally, the implementation of a circular economy contributes to reducing pollution and ecosystem damage, maintaining water quality, and supporting biodiversity. In addition, the circular economy approach strengthens social cohesion, strengthens relationships between residents, and increases collective responsibility in resource management. However, this study also identified several challenges in implementing a circular economy. Lack of infrastructure and technology, social and cultural barriers, and lack of financial support are the main obstacles. Limited facilities for waste processing and recycling, resistance to change, and limited access to financial resources hinder the potential for wider implementation of a circular economy. To overcome these challenges, more investment in environmentally friendly infrastructure and technology is needed. In addition, education and training on the circular economy must be improved to increase public understanding. Support from government policies and programs that facilitate the adoption of a circular economy and provide access to financial resources is also very important. A participatory approach that involves local communities in the planning and implementation of circular economy projects and respect for local wisdom will help realize a sustainable circular economy and provide long-term benefits for the community and the environment in South Kalimantan.

Acknowledgments.

The ULM Research and Community Service Institute (LPPM) which has funded our team's Compulsory Research Lecturer Program (PDWM).

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