Vol. 6 No 1 January 2025, pp.287-297
EISSN 2722-2861
Progress in Social Development

BIODIVERSITY CONSERVATION IN INDONESIAN COASTAL AREAS: ISSUES, CHALLENGES, AND MODERNISING GOVERNANCE

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ABSTRACT:

The role of stakeholders has attractively expanded, with agencies like the private and public sectors using the analysis of many challenges in biodiversity conservation. This paper explores the findings from programs of a biodiversity park called *Taman Keanekaragaman Hayati* (KEHATI) that have been experienced with the sharing of division work to promote a sustainable development goal, including Indramayu governments and Polytama in Indonesia. The article reflects on the changing role of stakeholders to deliver conserving biodiversity: what are problems and why these party of stakeholders should be transformed. This research aims to analyze the current conditions related to biodiversity conservation, the challenges faced, and the necessary governance changes to ensure effective conservation efforts. Field findings indicate that biodiversity conservation efforts are confronted with significant conflicts of interest. In addition, researchers discovered that development impact can be enhanced when governing rules are modernized. Complementary support is often necessary to reduce many challenges in endangered coastal area and support innovations that leads to governance transformation.

Keywords: Conserving Biodiversity, Indonesian Coastal, Sustainable Livelihoods, Community Development

Article Info		
Received	:	January 22nd , 2025
Accepted	:	January 29th , 2025
Published	:	February 1st, 2025

1. INTRODUCTION

Biodiversity conservation has faced various challenges, one of the most frequently occurring is a conflict between humans and wildlife (Dickman, 2010; König et al., 2020; Travers et al., 2019). When a regulation is not perfected, this will lead to the continuous exploitation of natural resources by humans (Mejías-Balsalobre et al., 2021)Analyzing this, stakeholders have a crucial role in changing people's views to preserve the environment (Ara & Islam, 2019). This changing role can be an alternative in the process of bringing trust from indigenous communities to collaborate in building nature conservation and a sustainable development agenda (Kristiansen et al., 2021). There is an assumption that conflict between humans and the environment occurs because development does not guarantee human survival (Snyman & Bricker, 2019; Selva et al., 2019) . The combination of actors or collaboration of stakeholders, designed for biodiversity conservation programs, can be an alternative solution in future development projects (Garcia & Cater, 2020). This not only has implications for the preservation of various types of flora and fauna in coastal areas but also becomes an alternative solution to provide new livelihoods for local communities.

Support for changes in stakeholders in biodiversity conservation has been considered in the existing literature, and in practice is continuously carried out. Several studies emphasize the importance of looking at the changing roles of stakeholders in conservation, such as formal and informal relationships with social institutions, social-ecological systems, the formation of new networks, and coordination between stakeholders (Adams et al., 2018; Bodin, 2017; Escandon-Barbosa et al., 2019). Likewise, Colvin et al. (2016) and Song et al. (2019) also emphasize another important element in the biodiversity conservation management process by building trust in local communities. Another systematic approach states that the conservation approach must be built through effective communication strategies in dealing with various social aspects (Ison et al., 2021).

Meanwhile, Boiral & Heras-Saizarbitoria (2017) suggest that the conservation process requires the business sector to reshape wider stakeholder involvement. This is in line with the analysis which states that a key role in dealing with conservation diffusion requires social networks to identify the critical point of failure of biodiversity conservation so far (Mbaru & Barnes, 2017). Departing from the trend of the existing literature, then building on statements about whether stakeholders can be useful in biodiversity conservation (Young et al., 2013), this study is present as an alternative means to map the changing roles of stakeholders in dealing with conservation problems and challenges.

This article is built based on the critical views of the scholars mentioned above, and contributes to filling in the gaps in the study of changing the role of stakeholders in biodiversity conservation. This article aims to analyze the current conditions related to biodiversity conservation, the challenges faced, and the necessary governance changes to ensure effective conservation efforts. To better understand the topic, the researcher mapped out three main problems. First, examining the conditions and challenges faced by coastal areas at risk in efforts to conserve biodiversity. Second, analyzing the challenges encountered by each actor in the management of conservation areas. Third, identifying changes in the roles of stakeholders in the conservation process and the forms of conservation that impact sustainable livelihoods. The three statements are considered sufficient to represent the changing roles of stakeholders in biodiversity conservation, which so far have weaknesses in the aspect of collaboration and division of roles. This becomes an important part of the process of formulating new regulations on conservation issues, and the results of the agreement can be used as a reference to build a balanced and sustainable natural and social life.

The existence of a new strategy of preserving biodiversity in coastal areas will produce a narrative about patterns and models of sustainable development. This supports the discovery of new livelihoods that improve the well-being of local communities (Naidoo et al., 2019). Changes in leadership patterns will lead to the survival of biodiversity so that it can support development efforts in the midst of climate change (Janaki et al., 2021). With the participatory-democratic collaboration model, it will produce local community involvement (inner motivation) independently and genuine (not engineered) (Dupke et al., 2019). This is a process of locality-based community development (environmental wisdom) that is not influenced by outsiders, where the tendency for development failure is born from outsiders themselves (conflict of interest).

1.1 Collaboration Stakeholders in Surviving Biodiversity: Evidence of Existing Studies

Stakeholder collaboration is a way to achieve biodiversity conservation goals (Neleman & de Castro, 2016). Stakeholder collaboration can also be defined as a system of natural resources protection through a multilevel governance process, such as local leadership, indigenous communities, supportive agents of the state, actors from civil society groups, private sectors, and the government (Mondino & Beery, 2018; Towner, 2018)This collaboration in the management of biodiversity can involve environmental conservation organizations, social organizations, and the industrial world (Snyman, 2014) . The support of all parties to conserve natural resources appears as an acknowledgment that the strategy to conserve various types of flora and fauna requires local community initiatives through community-based conservation [CBC] (Armitage et al., 2020). This approach refers to conservation governance through the collaboration of stakeholders to make decisions in achieving sustainable development goals (Travers et al., 2019). The purpose of this collaboration is at least how the interests of all stakeholders produce long-term agreements as an accommodative new source of livelihood between human and natural resources (Syafar & Ulumi, 2021). For this reason, conservation to maintain diverse biodiversity requires a combination of actors or collaboration of stakeholders, such as the role of indigenous peoples, government, civil society, and the private sector.

Conserving biodiversity has received quite a variety of responses. This happens because the human–wildlife conflict is still the scourge of environmental conservation. Dickman (2010) analyzes that conservation practices tend to fail because biologists are rarely equipped with the understanding to assess anthropological factors when dealing with human-wildlife conflicts. In line with that, König et al. (2020) reported that conservation should encourage the role of communities in promoting behavior change. An inter-and transdisciplinary approach from various multilevel governance is needed by emphasizing aspects of human-wildlife coexistence. Another challenge also arises when there is an assumption that the implementation of the CBC concept in various communities is not a panacea (a panacea) (Terborgh & Peres, 2017; Thondhlana & Cundill, 2017). Human-wildlife conflict is the main factor for the persistence of a dispute in this kind of biodiversity conservation practice.

In some research results, Uggla (2018), for example, recommends that stakeholders should frame and visualize representative biodiversity conservation policies. This is a form of preventing the exploitation of natural resources by humans, and the European Union policy is an example to see the factors and processes in reducing cases of natural exploitation. As an example of another case, Kariyawasam et al. (2021) and Maharjan and Maharjan (2020) analyze that biodiversity conservation and protection in avoiding climate change is difficult to predict in tropical island areas, such as Sri Lanka and Nepal. They suggest that decision makers

must fully understand the issue of the conservation of native plant biodiversity in the future. Moreover, relevant stakeholders should provide support in the form of training and awareness, risk analysis, livelihood and financial support, coordination and networking, and facilitate policy formulation for local communities. The shift from a position-based model to an issue/interest-based model has been appropriate in adapting to climate change. In another case in Brazil as analyzed by Verde Selva et al. (2019), they analyze that areas with high biodiversity often coincide with poor areas so the conservation process has implications for high economic and social costs. This happens because the stakeholders who spend funds for the conservation of natural resources are not sufficient to build a special conservation area. Moreover, explicitly compensation issued by stakeholders is not sufficient for the sustainable development agenda. This problem can be avoided by collaborating with actors operating in environmental conservation areas with governance that can increase the institutional capacity of local actors.

In a different context, Takeda et al. (2021) and Janaki et al. (2021) also suggest that the mitigation process in coastal areas requires an understanding of social issues, and can conserve biodiversity through the role of traditional beliefs. In the face of changing socioeconomics and the global need for wildlife, stakeholders must provide opportunities aimed at reconciling the complexities of human needs with conservation goals. In some cases, such as in Africa, for example, efforts to reconcile human-wildlife conflicts with conservation goals can use local languages and traditional knowledge in conservation strategies (Gafner-Rojas, 2020). On the other hand, in Indonesia for example, there is a question as to why deforestation and conservation tend to fail. The study conducted by Maxton-Lee (2018) reminds us that Indonesia's deforestation tends to be a problem because the root causes are very complex, including local community awareness, hierarchical political dynamics, local history, and global political corporations. Thus, learning from existing studies, current research tries to find a new formulation in the process of biodiversity conservation in coastal areas.

Based on a study conducted by researchers in Indramayu Regency, West Java Province - Indonesia, empirically describes the changing role of stakeholders in conserving biodiversity. This study is considered still relevant to examine the role of stakeholders because it has not been able to raise the issue of community-based conservation as a tool for preserving natural resources in the research area. Concerning the meaning of CBC defined by Ruiz-Mallén et al. (2015) and Brooks et al. (2013) , this study attempts to describe the problems and challenges faced by stakeholders in preserving biodiversity, changing roles, and enacting ecotourism. The three reference topics were raised as crucial issues in the conservation of biodiversity process which can be used as references in sustainable development. This CBC concept becomes a systematic review in analyzing the changing roles of stakeholders in policy formulation, community empowerment, new sources of livelihood, and alternative development projects that are accommodating to indigenous and local communities.

2. METHOD

2.1 Study Area Descriptions

This research was conducted in a region with a high level of uniqueness. This area is the only miniature wetland biodiversity park on the island of Java. In addition to its unique natural conditions, this biodiversity park is also located in a disaster-prone area if no management interventions are implemented. This area is also considered successful in managing its biodiversity, with various contributions from stakeholders in the region. Figure 1 shows the coastal areas on the north coast of Java with an area of 20 kilometers. This coastal area is the research location which is divided into two: Kengkeng and Margadadi. Coastal areas in Kerangkeng cannot be conserved because of the natural quality that is no longer accommodating to preserving various types of flora and fauna. This area was originally a location that functions as a reservoir for seawater by preventing tidal flooding through planting mangroves and mangrove forests. However, due to the uncontrollable flow of seawater, which is the impact of forest destruction and exploitation, the area is unfit for conservation. The local community affected by the tidal flood was partially relocated to the Margadadi area. Meanwhile, the coastal area in Margadadi is a location that is used as an alternative by the government for the preservation of various biodiversity and human survival. With these conditions, the researchers decided to conduct a study on conserving biodiversity in Indramayu Regency, West Java Province - Indonesia.

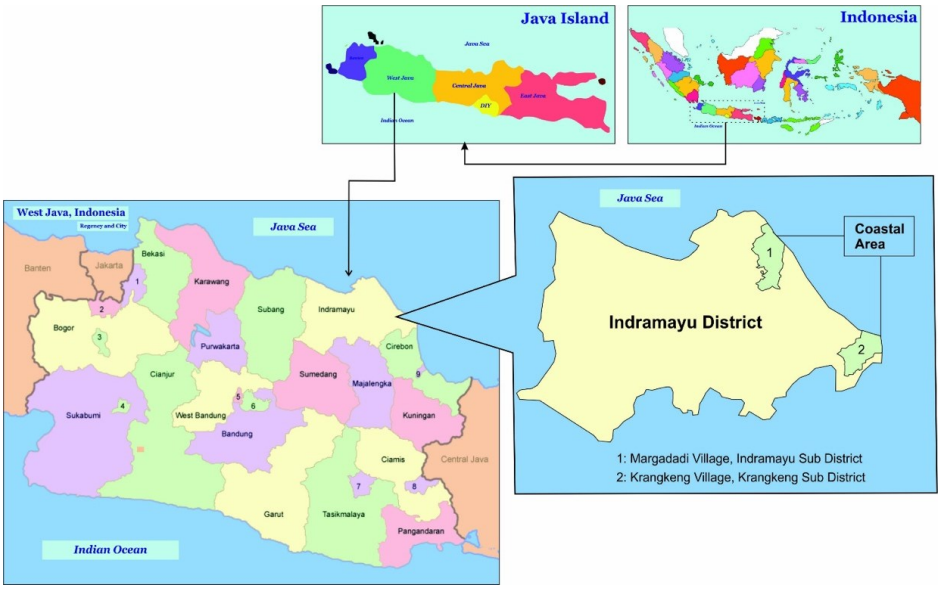

Figure 1. Study map area

Indramayu Kehati Park is located in the Margodadi Village area, Indramayu District, Idnramayu Regency, West Java Province, is land owned by the Indramayu Regency Government, which administratively in the previous two decades, its utilization was used as an urban forest area. In 2002, this area was designated as Kayu Putih Forest Park. Since the establishment of the Kayu Putih Indramayu City Forest Park, which is planned to be used as a carbon sink and storage area, as well as an area where animals and fauna live, as well as an area to reduce water, air and soil pollution in urban areas, so that it becomes a cheap tourist destination and fun, it didn't go well. This is due to the restructuring of the bureaucracy of the Ministry of Forestry which merged with the Ministry of Environment, where the delegation of management of urban forest parks has also shifted from being led by the current ministry to local governments. During the twelve years since the establishment of the urban forest park, the idea of converting the urban forest parkland into a biodiversity park has emerged. In 2016 the government rolled out a new idea or concept to maintain the function and purpose of the green open space in the area. In that year, the government prepared a site plan study to determine the initial design in the context of the green open space development plan.

2.2 Type of Research

This study departs from the assumption that endangered coastal areas should be a priority in sustainable development. Based on this assumption, the researcher developed a research analysis framework using a phenomenological approach. This approach is used to develop the principles of sustainable development goals, and dismisses positivists who fail to justify the constructivism paradigm in qualitative research (Neubauer et al., 2019). To develop this understanding, the researcher decided to understand the social phenomenon about the role of stakeholders in conserving biodiversity. The researcher's epistemological position regarding the study can be formulated by referring to the views of Groenewald (2004) through two steps. First, understanding social phenomena with the data contained in the perspectives of the participants or people involved in the research. Second, researchers are intensely involved in the data collection process. These two references become the researcher's initial view in defining the research problem which is combined with the researcher's basic beliefs.

The author conducted the research through several steps. As with most research, the author first prepared and drafted a research proposal. Data was collected based on available information from news media and previous studies. Subsequently, the author gathered data according to the research needs through observations and direct interviews within the time frame that will be explained in the following section. After that, the author conducted an analysis and compiled the article based on the predetermined guidelines.

2.3 Data Collection

The research data were obtained in three ways: observation, interviews, and documentation. First, observations were made to see the actual conditions of the environment and the lives of local communities in endangered coastal areas. To approach the actual conditions, the researcher used the participant method and frankly asked each participant to collect field data. This activity is an observation process to see the behavior, actions, interactions, and activities of all participants. This observation requires researchers to make field notes so that the data taken is not scattered, and makes it easier for researchers to sort the data. To facilitate the data interpretation process, the researcher recorded every research action while in the field using a tape recorder.

The researcher observed participants at home, the Margadadi Village office, the Indramayu Regency Environmental Service, Kehati Park, and the Java Sea brackish area. Observation activities took approximately three months: August – October 2022. After the field data was recorded, the researchers mapped the trend of research themes and topics to be analyzed as initial data. For this reason, the results of observations are used as data cross-checks to continue the interview process.

Second, the researcher conducted interviews with predetermined participants. Determination of participants using purposive sampling by mapping five stakeholders: Local Government (LG), Local Villagers (LV), Private Sectors (PS), Community Development Officers (CDO), and Kehati Park Managers (KPM). The researcher interviewed the participants by completing ten interviews (see Table 1). Researchers have prepared interview guidelines by collecting four main questions: (i) how is the biodiversity survival strategy carried out by the stakeholders; (ii) how is the change in the role of stakeholders in the conservation process of endangered coastal areas; (iii) how this form of conservation has implications for flora and fauna ecosystems; (iv) how the preservation of endangered coastal areas can build programs in sustainable human development. All participants were interviewed flexibly to allow them to express their opinions openly. Interviews were conducted between August – October 2022. Each interview took between 30 minutes to 1.5 hours per session. Each session, the researcher recorded using a Samsung Android after obtaining the consent of all participants. In this case, the researcher uses a pseudonym to ensure the research code of ethics so that there is no conflict of interest between all stakeholders and the researcher. Researchers were assisted by two field assistants in the data transcription process, and all researchers conducted in-depth interviews with participants.

Table 1. Statistical table of interviews

No.	Code	Stakeholders	Sex	age	Interview date	Interview duration (min)	Interview location
1.	I1	LG	Male	52	16/8/2022	30	Office
2.	I2	LG	Male	45	17/8/2022	50	Office
3.	I3	LV	Male	60	20/8/2022	70	Home
4.	14	LV	female	57	11/8/2022	90	Home
5.	I5	PS	Male	40	29/8/2022	58	Caffe
6.	I6	LV	Male	53	5/9/2022	45	Home
7.	I7	LG	female	46	12/9/2022	35	Office
8.	I8	KPM	Male	48	24/9/2022	52	Careful Park
9.	I9	CDO	Male	31	2/10/2022	45	Caffe
10.	I10	KPM	Male	30	10/10/2022	75	Careful Park

Finally, documentation includes all documents related to surviving biodiversity in endangered coastal areas. The documents in question are statistical data on sources of income for local communities, biodiversity baseline studies, environmental conservation laws, community meeting notes, the Polytama company website (https://polytama.co.id), and field notes. In addition, other documents that support this research are journals, books and policy briefs related to the issue of stakeholder collaboration in environmental conservation. All these documents were collected by the researcher after obtaining permission from the local authorities. Researchers also collect various photos as authentic evidence of research. This documentation becomes complementary data from two main data sources: interviews and observations. Furthermore, this document is searched for and then compiled in the data analysis stage.

2.4 Data Analysis

Data analysis begins when the researcher determines the topic of the research study. This step differs from the quantitative method which places data analysis at the end of the study. Researchers used five stages of data

analysis from a phenomenological approach: recording, horizontalization, cluster of meaning, interpretation, and report writing. The recording stage is the first step to building an analytical framework for the data found. This stage begins with creating files and organizing data, which the researcher then transcribes the interview results into a Personal Computer (PC). The horizontalization stage is the process of taking inventory of three data sources that are categorized with relevant issues. The researcher copied all the data that was sorted and selected according to the purpose of the research question in the form of a chimney panel. Cluster of meaning is the stage of classifying data that has been sorted based on the order of objectives and research themes. Interpretation is the stage of interpreting, sorting, and summarizing all the data that has been collected into one file. After that, the researcher wrote down all the interpreted data in the form of a research report, and then compiled it into a draft article. By comparing all data carefully, the researcher consistently validates and cross-checks all available data. This is a source triangulation step, and researchers do not hesitate to return to the field if they still find confused and multi-interpreted data to ask the participants again. Data verification is also carried out with members check to ensure data credibility.

3. RESULT AND DISCUSSION

3.1 Conserving Biodiversity in Coastal Areas: Issues and Challenges

Coastal areas in Indramayu Regency are transit locations for various fauna, especially bird species. This fauna species migrates every season from the Australian continent to the Asia-Pacific. This migration process has been running since the 1980s with Kengkeng as an initial stop. Initially, this area was a beautiful and representative forest area for a variety of flora and fauna. However, climate change and the complexities of human-wildlife conflict make the process of this region increasingly eroded and dysfunctional (Dickman, 2010). This situation was confirmed by LG (Local Government) that "local people are hunting animals and cutting trees unwisely" (I1). With this unwise human behavior, the Kerangkeng area as a bird haven no longer functions optimally and makes this area so badly damaged that it is impossible to revitalize.

Another problem also arises when the cage is believed by the local community as an area to increase income sources. Many people create new sources of income by converting coastal areas as places to cultivate various types of fish and shrimp. They set up fishing ponds. However, the establishment of these ponds has a tendency to exploit nature. Although the coastal area is a source of income, the community does not pay attention to environmental sustainability. As confirmed by LG (Local Government):

> *"This land conversion has consumed about 80 hectares as aquaculture area. This situation makes the protected forest area not function optimally. In fact, the area is being exploited by local people because it becomes a new source of income." (informant7)*

On the one hand, this coastal area has an impact on the economic aspect (Snyman, 2014) , people are less aware of the importance of preserving protected forest areas. This is due to weak social cohesion caused by limited local community knowledge (Jaya et al., 2022). The community does not give each other suggestions and actions to preserve nature. On the other hand, the government has banned people from hunting wildlife and cutting trees. Field facts show that local communities are still doing illegal logging. This situation is confirmed by LG that "local people do not comply with government instructions in protecting the environment and nature" (I8). Another LV also stated that "every member of the community is cutting trees illegally, and there are also many animals being hunted even though they are protected by law" (I4). This means, the problem in preservation lies in the weakness of community bonds within the community.

Another problem faced by local communities is social pathology. In the Margadadi village, for example, there are many community activities that have an attitude of moral hazard, such as gamble, drugs, prostitution, and others, as stated by CDO (I9) in the interview session. This condition indirectly encourages people to become consumptive so that they take various ways to fulfill it. Illegal actions in the destruction of protected forest areas and hunting of wild animals are the impact of the culture of consumerism. The local community is indirectly affected by the seduced by luxury (in local known as *semua cash*). Meanwhile, job opportunities are very limited, there are many people who choose alternatives to meet family needs by hunting animals and cutting trees illegally.

Due to illegal actions carried out by the community, natural conditions are increasingly damaged so that the deforestation of flora types causes tidal flooding and various fauna become extinct. In fact, "the presence of various types of flora and fauna should be able to support the environment for sustainable human life" (I4), as stated by LV (Local Villagers) in the interview session. Due to these conditions, it is impossible for the Kerangkeng area to be conserved as a buffer zone and human protection from natural disasters. By looking at the damaged environmental conditions, the stakeholders began to map out areas that have the potential for the preservation of various types of flora and fauna. As field notes, the distance between Kengkeng and Margadadi (currently a Kahati Park area) is around 30 kilometers (*Unpublished observations*). For three decades, people

in the Kerangkeng area have experienced a stagnation of life because nature is getting worse. The impact of unhealthy nature makes the environment threatened. Therefore, Margadadi was named by the collaboration stakeholders as a biodiversity park area.

Stakeholders initiate the conservation of biodiversity by involving local communities. Margadadi was chosen as an alternative location for the preservation of various types of flora and fauna and a response to the damage to protected forest areas. However, the challenge in preserving biodiversity in Margadadi is that the community also experiences the same issue, namely lack of awareness to protect nature and the environment. To change the mindset of the people of Margadadi, the local government in collaboration with PT. Polytama made plans for the "Wetland Ecosystem Replication" program. This program is a conservation of brackish swamp on the north coast of Java. There are many obstacles faced by stakeholders in the awareness process of environmental conservation, such as rejection and collaboration (Jaya et al., 2022). LV said that "the community around Kahati Park refuses to carry out the conservation process because it is considered that it can cause negative effects, such as tidal flooding" (I6). The misperceptions of the community prompted stakeholders to take program initiatives by involving tourism-aware groups (See Table 3).

Table 3. Awareness and Capacity Building Process for Local Communities

Empowerment Process	Activity Forms	Implication
Awareness	• Socialization • Focus Group Discussion (FGD) • Seminal works	Formation of public awareness
Capacity building	• Training on how to plant various types of flora • Animal care training • Training on how to use Eucalyptus • Urban farming training using solar panels • training on how to use organic waste	Environmental care and preservation
Empowering powerful	• Involvement in environmental preservation • Ecotourism development • Establishment of various local economic potentials (parking attendants, tours guides, tour managers, traders, and others)	Sustainable livelihoods

Margadadi is an area on the north coast of Java that has the potential to be affected by tidal flooding. Moreover, local people's awareness does not pay attention to the sustainability of life so there are many problems found in local communities, including the tendency to litter, cut down trees illegally, hunt protected animals, and others. As the historical record of the participant's story, "they were affected by the damaged living ecosystem having experienced the tidal flood in the 2000s" (I4). Due to this incident, the community began to realize that the prevention and improvement of natural conditions were strengthened when the victims fell. This was confirmed by PS stakeholders:

> *"In 2001, despite heavy rains and the overflowing capacity of the river's water discharge, the Kengkeng area began to experience a decline in the impact of the flood disaster. This is due to public awareness to conserve the environment by replanting trees, encouraging river revitalization, and dredging swamp areas as water catchments" (Informant5)*

Another challenge also arises with government regulations that are not firm against environmental destroyers. In addition, the presence of a City Park that has been established based on the Decree of the Regent of Indramayu no. 522.1/Kep.125A-Dishutbun 2002, but the government is less accommodating to nature conservation. This is due to the government's consistency in maintaining the park. As LG stated that "we do not have the capacity to develop the area due to lack of funds" (I7). On the basis of this statement, many stakeholders began to empathize with the city park. One of the stakeholders who attended was the role of the private sector by involving academics to carry out a process of awareness and intervention to local government. Since 2019, efforts to preserve coastal areas have begun with the involvement of three relevant stakeholders: the local government, PT. Polytama and IPB (Bogor Agricultural Institute) as academics. However, the facts on the ground prove that the private sector tends to be pragmatic in the process of preserving the environment.

As LV puts it, “after the redevelopment of the city park as biodiversity conservation, we feel that PT Polytama has only completed its task as an environmental conservationist, but has not yet had an impact on sustainability in the community empowerment program” (I3).

3.2 Changing Role of Stakeholders: From Governing to Empowering

As explained above, coastal areas face various problems and challenges in the process of preserving biodiversity. For this reason, researchers can describe the changing roles of stakeholders in the establishment of a biodiversity park (Kehati) in Margadadi. The establishment of the Kahati park is a response from three stakeholders (local government, private sector, and local community concerns) as an awareness of the importance of environmental conservation. But before that, governance experienced dynamic changes in the bureaucratic structure. In the New Order era, bureaucratic governance adhered to a centralized system so that the Ministry of Environment and the Ministry of Forestry were separated. With the principle of good governance, the implementation of programs in environmental preservation is not effective (Reference). This makes the coastal area development process in Indramayu Regency stagnate. Interview data also show that “coastal areas have been identified since 1980” (I2), as stated by LG.

Changes in the bureaucratic structure from centralization to post-reform decentralization, the delegation of regional development authority to the West Java Provincial government, the coastal area being used as an urban forest area. During the transition from the New Order to Reformation, Indonesia experienced imperfections in governance. This situation makes governance that prioritizes regional development held hostage by regulation loopholes. Although the urban forest park was inaugurated by the Indramayu Regency Government since 2002, changes in the bureaucratic structure have left the area neglected for approximately 12 years. This neglected area is “because the bureaucratic governance organization does not receive financial support for environmental conservation” (I10), as stated by KPM in the interview session. Based on this condition, along with changes in the structure of the bureaucracy and governance since the era of President Jokowi in 2014, many state institutions have begun to make changes to development governance. This is evident in the pattern of budgeting for environmental conservation disbursed by the Ministry of Environment and Forestry through the collaboration of stakeholders in the implementation of conservation programs.

With the support of these various stakeholders, the urban forest park has begun to be conserved as a biodiversity area. This step of change is a response from the local government of Indramayu Regency to preserve the coastal area as a place for the preservation of various types of flora and fauna. Field data shows that biodiversity conservation is carried out using a stakeholder collaboration model. This is indicated by the presence of three elements, namely the private sector, public sector, and academia (See Table 4). The private sector contributes in supporting the funding of the planning process and development of the Kahati park. The public sector is tasked with changing regulations so that there is no conflict of interest in the community. Academics work to provide recommendations through research on local governments and Polytama companies. Since 2019, the results of this research have become a feasibility study in the design scheme of the Kahati Park development (See Figure 3). This design is the first step in the process of conservation and environmental preservation in the coastal area.

Table 4. Collaboration of stakeholders in conserving biodiversity in endangered coastal areas

Stakeholders	Sectors	Role	Output
Public sector	Department of Environment and Forestry of Indramayu Regency	Change regulations	Decree of the Regent of Indramayu Regency, No. 660/Kep.61.1-DLH/2019 concerning the change in the status of urban forests into green open spaces for biodiversity parks and the determination of regional work units to manage green open spaces
Private Sector	PT. Polytama	Donor	Letter of Cooperation Agreement between the Environmental Service of Indramayu Regency and PT Polytama Propindi No. 005/NK/PP-CSR/2019
Scholars	Bogor Agricultural Institute (IPB)	Experts	Baseline study of PT Polytama Propindo's biodiversity park, Juntinyuat, Indramayu

After the stakeholder collaboration process is formed, the local government negotiates with the Margadadi Village government to formulate and develop a biodiversity park area. This negotiation process is carried out by means of socialization and Focus Group Discussion (FGD). The socialization process was carried out in (4) face-to-face meetings: Kahati Park planning discussions, area sterilization, development, and empowerment. FGD activities were carried out to accommodate all input from local residents so that no one felt disadvantaged. LV stated that "initially, we responded to the plan to build the Kahati Park, although there was some doubt in the community due to fears of flooding" (I1). On the basis of this process, local communities are participatory in the planning and development of the urban forest area into a Kahati Park.

Figure 3 . Division of three areas of the biodiversity park area in Margadadi

The collaboration of stakeholders has formed a new model in the process of community empowerment which is divided into five categories: economic, agricultural, educational, social, and environmental (*Unpublished observations*). First, in the economic sector by forming a tourism awareness group to develop a biodiversity park conservation area with financial assistance. Second, agriculture through the development of urban farming by developing hydroponic systems, developing organic compost, and processing eucalyptus leaves. Third, in the field of education, training to become keeper of all types of animals that are conserved by the manager of the biodiversity park. Fourth, in the social sector, the formation and involvement of various communities to develop all flora and fauna resources. Fifth, in the field of environment, awareness training for the community to care for and maintain various types of flora. All community empowerment activities are carried out in a participatory and collaborative manner.

3.3 Enacting Ecotourism and Its Implications for Local Development

Biodiversity parks exist as conservation areas for various types of flora and fauna, educational facilities, green open spaces, and ecotourism. First, Kahati Park is an area to preserve flora and fauna, both protected and endangered species. Second, as a means of education, this area has been named for the development of science in biodiversity issues such as research in the fields of biology, ecosystems, and so on. Third, as a green open space that can be used by the community as a means of healing and recreation. Fourth, this area is also a new economic source for local communities with the presence of types of tours packed in ecotourism development (see table 5). For this reason, the presence of a biodiversity park is not only used as an environmental conservation area, but also becomes an important element for the sustainable life of local communities.

Table 5. Tours packed in enabling ecotourism areas

Type of ecotourism availability	Tours packed	Explanations
Deer Park	- Feeding the deer by visitors - selfie - Education about deer care by tours guide	Visitors can do nature tours and get to know various types of deer.
Flora Education Zones	- Introduction of flora types by tours guide - How to plant for environmental preservation - Utilization of Eucalyptus tree species	This packed tour becomes a special zone for the education and research sector to support development projects.
Swamp Area	- Jogging Track - Visit to Magrove conservation area - selfie	This area is an alternative means for visitors to travel and exercise, because of the availability of land for jogging.

Ecotourism in the Kahati area has had an impact on the economic activities of the community. The activity was initiated by the Margadadi Village government with the involvement of every element of the local community, such as youth organizations, traders' associations, bird lovers, a community of reptile lovers, tour guides, cleaners, and deer keepers. Each of these communities can reach all the facilities available in the biodiversity park area. The area is very connected with ecotourism development and the community can feel the impact of the development of coastal area conservation. As stated by LG, the following:

> *"We have established communication with local communities so they can take advantage of the biodiversity areas. They can participate in the management, supervision and creation of new jobs, such as traders (Informant3)."*

As a center for educational development, the biodiversity park can also benefit from student visits from elementary to higher education. These visitors are required to report to the manager of the Kahati park tourism area. As for the economic contribution, visitors are required to buy various types of food for the conserved animals that have been provided. This situation has become an activity in the business cycle in the environmental conservation of Margadadi. In addition, the presence of the Kahati park also changes the mindset of the local community that pond management that does not pay attention to the ecosystem can be prevented slowly. The development of ecotourism is not only an environmental conservation area, but also an alternative solution to increasing and creating new jobs. Economic improvement for local communities, the Kahati park area has a positive effect with the presence of new variants of environmental conservation, such as hydroponic development, utilization of organic waste, utilization of Eucalyptus leaves for oil, and utilization of ketapang seeds. The presence of these various conservation variants has had an economic effect with revenues ranging from IDR 1,700,000 – IDR 2,200,000 (or USD 111.55 – USD 144.36).

3.4 Discussion

This study provides an overview of mapping the problems and challenges faced by local communities, in order to formulate strategies for conserving biodiversity in coastal areas. This is an alternative for planning environmental conservation in the face of social pathology and weak public awareness in respecting nature and the environment. Moreover, this study exemplifies how the strategy of conserving biodiversity has succeeded in dealing with problems of environmental exploitation, weak social solidarity and the rise of consumerism culture. Despite facing the challenges of public awareness in respecting ecosystems, disaster-prone areas, policies that are not adaptive to environmental conservation and the tendency of third parties to think pragmatically in carrying out development programs, the involvement and collaboration of stakeholders is able to maintain ecosystems in coastal areas. Consistent with previous research, this study at least shows a new pattern in biodiversity conservation that emphasizes the importance of collaboration between stakeholders (Armitage et al., 2020). The biodiversity park in Margadadi is proof that conserving ecosystems can be carried out in an accommodative, egalitarian, respectful and sustainable way. This is an important example of the reframing and reconceptualization of sustainable development goals based on life on land (no. 15), and the

benefits of conservation can be used as an example in the wider spectrum of policymaking (Terborgh & Peres, 2017).

Changes in the role of stakeholders have also encouraged and accelerated the conservation of biodiversity in Margadadi Village. Despite the transition of bureaucratic governance from centralization to decentralization after the 1998 reform, the Indonesian government proposes simplifying the duties and responsibilities of state apparatus. As a result, there are many regulations governing changes in governance to encourage accelerated development in coastal areas, Indramayu Regency, to become biodiversity conservation areas. The presence of stakeholders, as explained in the findings, has created a new space, where the change in roles is not only carrying out ecosystem conservation programs, but also building local community awareness to appreciate the diversity of flora and fauna species through full empowerment. According to Boiral & Heras-Saizarbitoria (2017) suggest that various stakeholders should change their roles to collaborate with each other in realizing sustainable livelihoods. Moreover, the challenge in the future is climate change which cannot be controlled if all elements do not pay attention to the continuity of ecosystem life (Takeda et al., 2021). For this reason, stakeholders must have strategies and plans in conserving coastal areas to achieve the SDGs for life on land.

As an important point that must be considered, biodiversity conservation has created new job opportunities for local communities. Although implicitly not perfect, the presence of the Kehati park in Margadadi has encouraged the provision of ecotourism as an alternative means of balancing the ecosystem between humans, flora and fauna. Environmental conservation through the biodiversity park program creates space for various types of flora and fauna to remain sustainable, while humans benefit from the program by providing new jobs. Consistent with this fact, one of the problems that often arises between humans and the environment is the excessive exploitation of nature due to the interests of income sources and economic growth (Dickman, 2010; König et al., 2020; Travers et al., 2019). Analyzing this, the biodiversity park is a form of environmental conservation that offers a balance of ecosystems. All of these attributes are very close to the meaning of surviving biodiversity as presented in the literature review. Furthermore, the principles of sustainable development in coastal areas have been implemented and have produced economic, social, political, educational, and environmental impacts (Lindsey et al., 2001; Onitsuka et al., 2018).

The development of the Kehati park in Margadadi may differ from other places around the world. Discussion of research findings that deserve attention is about the role of stakeholders between the private and public sectors. The researcher found that the private sector was still focused on nature conservation, but not for sustainable empowerment programs. This fact is evidence that the awareness of the private sector is still limited in infrastructure development, while there is another assumption that has the responsibility to empower social communities and local communities is the local government. In line with that, Boiral & Heras-Saizarbitoria (2017) analyze that the division of stakeholder roles is an important part in formulating sustainable development. Ruiz-Mallen et al. (2015) and Nguyen et al. (2022) also follow the same issue to pay attention to the pattern of collaboration in planning the development of coastal areas. This pattern must appear in the division of tasks and functions of each stakeholder when a memorandum of understanding is signed by all parties (Idemudia & Osayande, 2018). On this basis, the researcher proposes a reformating pattern in order to develop coastal areas that are not only focused on infrastructure development, community empowerment must also be an integral part of the stakeholders' memorandum of understanding.

4. CONCLUSION

An explanation of conserving biodiversity can be an opener for discussion in preparing development plans for disaster-prone areas, such as brackish areas that have the potential to cause tidal flooding. On this basis, the problems and challenges faced by stakeholders in the conservation of the biodiversity park in Margadadi are considered as potential sources for improving both the balance of the ecosystem and the creation of new resources for sustainable livelihoods. The clarity of the role of stakeholders will make it possible to strengthen conservation and human development programs through bonds of solidarity, collaboration, and conformity.

ACKNOWLEDGMENT

Thank you to the Institute for Research and Community Engagement (Lembaga Penelitian dan Pengabdian Masyarakat – LP2M) UIN Sunan Kalijaga Yogyakarta. The researchers are particularly grateful to all research assistants for their substantial contributions to the processing of all data collected during fieldwork. We also would like to thank the editors and anonymous reviewers for their review.

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