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Regulatory Impact Analysis on Mangrove Forest in the Coastal Area of the Bandar Lampung

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Abstract. Kota Karang Mangrove is one of the mangrove forests located in urban areas with a limited existence in Indonesia. Mangrove forests have economic, physical, and ecological potential. Several policy designs have been issued to protect and develop the potential of mangrove forests, but they have not been optimal in protecting and managing mangrove forests. The purpose of this study was to assess the quality of the mangrove forest policy in Karang City. The research method uses a qualitative case study design, the research period is September to December 2020. The research location is in the coastal area of Karang City Village, Teluk Betung Timur, Bandar Lampung City, Lampung Province, Indonesia. The data collection technique used in-depth interviews, the determination of the informants was purposive, consisting of the Ministry of Maritime Affairs and Fisheries, the Lampung Province Maritime Affairs and Fisheries Service, the Lampung Provincial Forestry Service, the Bandar Lampung City Marine and Fisheries Service, the Bandar Lampung City Housing and Settlement Service, NGOs (Walhi, Mitra Bentala, and Hands) and the Karang City Community. Data has been collected through desk review and stock-taking using regulatory impact analysis. The results showed at the problem analysis stage; Mangrove forests have not become the main issue, the location of the authority is limited, it contradicts national policies, there are obstacles in the implementation and implementer processes. Only 3 policies are used as a basis for policy development, integration, and collaboration of 3 key stakeholders in policy development. The choice of ecotourism and green open space policy development becomes smart regulation that can improve policy quality, transparency, accountability, and costs.

1. Introduction

Mangrove Kota Karang Mangrove is one of the mangrove forests located in urban areas which is very limited in existence and is found only in five regions in Indonesia, including DKI Jakarta, Central Java, Yogyakarta, East Java, North Kalimantan, and Bandar Lampung City [1]. The existence of mangrove forests has economic, physical, and ecological potential and functions [2]. Mangroves function physically as carbon sequestration and protection for the coastal zone to eliminate tidal wave energy [3]. Economically, mangroves can be used as ecotourism so that they can create job opportunities, increase alternative income, and become business opportunities for the community [4]. The ecological function of mangroves as a habitat for marine biota and other types that live in mangrove ecosystems, provides soil fertility for the surrounding land [5], including mangrove forests which have various functions in line with the function of green open spaces in urban areas [6].



The study was based on the issue of neglect and minimal protection of mangrove forests in urban areas in several parts of Indonesia. This has relevance to public policy as well as a means of success in achieving two international standards, in the form of: first, the sustainable development goals (SDGs) item 14, which contains the preservation and utilization of marine and oceanic resources for sustainable development. Marine resources in coastal areas are generally characterized by mangrove forests [7]. Second, the Ramsar Convention on Wetlands, which contains an international work plan on cooperation in the conservation and sustainable use of mangroves [8]. The two agreements form the basis for various national policy implementations in all countries with mangrove forests, including Indonesia.

This study focuses on the protection and management of mangrove forests in urban areas. The picture of the mangrove forest ecosystem that is still under threat, is prone to change its function, whether it is conversion to ponds, gardens including residential areas, even though several protection policies have been established and the implementation of policies is carried out by cross-sectoral agencies. Several roles of state institutions with strategic mangrove policies have been established in Indonesia, including: first, the Ministry of Forestry through the Forestry Law and Law No. 5/1990 on Conservation of Living Natural Resources and Ecosystems views mangroves as forests; second, the Ministry of Marine Affairs and Fisheries has duties and functions regarding coastal resources, including mangrove forests; The Ministry of Environment is involved because mangrove damage is the standard criterion for ecosystem damage. Several laws related to mangrove forests have been issued, including Law No. 41/1999 on Forestry, Law No. 26/2007 on Spatial Planning, Law No. 27/2007 on Management of Coastal Areas and Small Islands, and Law No. 32/2009 on Environmental Protection and Management [9, 10]. At the local government level, the Lampung Provincial Government has issued Lampung Provincial Regulation No. 1 of 2018 which regulates the zoning plan for coastal areas and small islands, and the Governor of Lampung Province Regulation No. 20 of 2019 which regulates the development of water areas and coastal conservation areas and small islands in Lampung Province. However, the protection of mangrove forests is still not optimal. Some of the causes are overlapping policies on mangroves and mangrove protection on paper [11], wrong perceptions of the role and function of mangrove forests [12], several cases of criminalization of fishermen and community groups who conserve coastal resources by replanting mangroves due to lack of law enforcement. and weak enforcement of crimes against cutting and destroying mangrove forests [13].

This study is important because several studies related to the current conditions and the existence of mangrove forests in various parts of the world describe opportunities as well as threats. A study using an environmental economics perspective that has been carried out previously describes the contribution of US\$ 200-900 thousand of the economic benefits contained in one hectare of mangrove forest area [14]. These benefits are obtained from the production of wood, charcoal, fish, shrimp, and crab products, as well as other economic products. Contribution is obtained from the revenue from the natural tourism sector (ecotourism) because it can attract local and international tourist visits. Some of the threats include garbage dumped in the forest, oil and toxic chemicals, human encroachment, development reasons, changes in seawater temperature due to weather changes, and global warming. Meanwhile, another study [15], describes a decrease in the area of mangrove forests in the world. From 18.8 million hectares to 15.2 million hectares in 2018. The decline was due to massive damage that occurred in several countries, including Brazil, Mexico, and Indonesia. The FAO study states that the damage to mangrove debt is due to the conversion of environmental functions into salt ponds, shrimp ponds, overexploitation for economic purposes, as well as industrial waste that is carelessly dumped in river estuaries [16]

Several previous studies have linked the protection and management of mangrove forests, especially in cities, with a lack of awareness, lack of knowledge, and education about the importance of preserving the environment [17]. Another study relates to preservation methods by keeping forest ecosystems by their natural habitats [18], law enforcement and processes, conflicts over authority over mangrove forests [19]. However, it is still seldom related to how the policy-making process, including the assessment of several alternatives and consultation with stakeholders, requires encouragement of policy-making that provides the greatest benefits to the environment, the existence of forests and communities, policies become strong and justified. The importance of policies or regulations for the protection and

management of quality mangrove forests because the applicable policies/regu must have reasons, the policy chosen is the best alternative, the benefits and costs are calculated, public consultation (stakeholders) is carried out and most importantly no adverse impacts of the policy are felt. Policy development through structured, systematic, tested steps with a rigorous assessment of various choices nations is a key instrument for achieving policy quality [20, 21].

The research objective was to analyze the quality of the mangrove forest policy in Karang City using Regulatory impact analysis. The resulting policy recommendations will be useful for policymakers and stakeholders in making policies that are more efficient, effective, transparent, and accountable so that they have a better impact on the welfare of society and the state. Besides that, it is an important part of the effort or movement to create smart regulations.

2. Methods

This study uses a qualitative case study design [22]. The research period was from September to December 2020. The research location was in the coastal area of Kota Karang Village, Teluk Betung Timur District, Bandar Lampung City, Lampung Province, Indonesia. Data collection techniques using in-depth interviews. The technique of determining informants was purposive, consisting of the Ministry of Maritime Affairs and Fisheries, the Lampung Province Maritime Affairs and Fisheries Service, the Lampung Provincial Forestry Service, the Bandar Lampung City Marine and Fisheries Service, the Bandar Lampung City Housing and Settlement Service, NGOs (Walhi, Mitra Bentala, and Hands).) and the Urban Community at Kota Karang.

Apart from qualitative design, the study also used desk reviews and stock-taking / stock talking for data collection. Desk reviews were conducted to map various regulations, the development of policy impact literature from various aspects (social, economic, political, environmental), environmental and sustainable development standards and objectives. Desk reviews are useful in enriching the concept of specific mangrove and environmental policies and by the objectives, international and national standards. Stock-taking / stock talking focuses on research results and current publications on the impact of regulations in the form of issues/problems policies/regulations stakeholders, costs and benefits, alternative policies [23].

The data collected through qualitative design, desk review and stock taking/stock opname were reviewed using regulatory impact analysis [24]. Regulatory impact analysis, can explain the success of the protection of urban mangrove forests through design and policy reforms through the following stages: 1) Problem analysis: describes the main issues / problems of urban mangrove forests, their causes and impacts; 2) Mapping of regulations: identifying mangrove forest regulations, whether vertical, horizontal, national or regional; 3) Stakeholder analysis: mapping actors and their interests in mangrove forest policy issues; 4) Policy development options: analyze the costs and benefits of policy options

3. Result and Discussion

3.1. Research Location Conditions

The study was conducted in Kota Karang Kelurahan, located in Teluk Betung Timur District with an area of 35 ha and has a coastline (coastal area). Topographical conditions in the mangrove forest area are flat, both in forest and land areas. The soil condition in the mangrove area has muddy soil. Rainfall is relatively low and there are no freshwater sources in the mangrove area.

Based on data from the Central Statistics Agency (BPS) of Bandar Lampung City, in 2020 the Ward of Kota Karang has a population of 10,186 people consisting of 5,440 male residents and 5,180 female residents. The number of household heads in the Kota Karang Kelurahan is 2,642 households. The population density of Kota Karang Kelurahan is 30,349 people / km². Its strategic location makes this area the center of general trade, services, and the center of the economy. The total population of Karang City is 10,186 people consisting of 5,440 male residents and 5,180 female residents. The number of household heads in the Kota Karang Kelurahan is 2,642 households. The population density of Kota Karang Kelurahan is 30,349 people / km². The population in this kelurahan has various religions, Islam 9,676 people, Catholicism 117, Hindu 213, and Buddhist 53. The heart of the gate of the Teluk Betung

Timur Subdistrict is the Kota Karang Village. Its strategic location makes this area the center of general trade, services, and the center of the economy. This economic activity is supported by the existence of traditional markets, processing centers for salted fish and anchovies on Pasaran Island. Most of the population makes a living as fishermen, construction workers, and entrepreneurs / trading.



Figure 1. Map of Kota Karang

3.2. Regulatory impact analysis

3.2.1. Problem analysis. Currently, the area of mangrove forest in Bandar Lampung is only 5,478 ha from 59.35 ha [1]. One of the contributing factors is the conversion of mangrove forests on the urban coast to ports, settlements and other activities caused by human activities and illegal encroachment from local communities. The low level of income of the Head of Family in the Karang City Village is accompanied by the level of education of the people in this area which tends to be low, resulting in people living in this area, especially those on the banks of the river, unable to get good jobs. This affects the settlement pattern in the form of settlement expansion towards the riverbanks towards the mangrove location. In the early 1990s, the coast of Bandar Lampung City had a mangrove ecosystem that almost covered the entire coastline of Bandar Lampung City. The increase in population and development causes the mangroves in Bandar Lampung City to experience degradation. Degradation causes the mangrove ecosystem to remain only a few hectares and in certain locations. Meanwhile, the potential for the utilization of mangrove forests in Bandar Lampung was found to be very minimal. The government does not get the potential of mangrove forests in urban areas. This attention is one of the keys to management and protection, given the existence of mangrove forests that are only found in a few areas in Indonesia. The following is the problem analysis in the form of a problem tree, which can be seen in Figure 1.

The analysis in Figure 1 shows that the problem that has occurred in the mangrove forests of Karang City is that the area has decreased since 1993. This can be seen from the absence of an increase in the area of mangrove forests in the city of Bandar Lampung. Another factor is the conversion of mangrove forests on the urban coast to ports, settlements, and other activities in Bandar Lampung. The potential for utilization of mangrove forests in the city of Bandar Lampung is minimal. The analysis (Figure 2) illustrates that the main problem is that the protection and management of mangrove forests in urban areas is minimal and unsustainable. The success of determining mangrove forests for further development is seen from the authority of local government institutions with reference to the regional autonomy law. The position of mangrove forests in urban areas makes the authority limited to the OPD of the Housing and Settlement Service, Bandar Lampung City area, while the forestry OPD, which has

the main mandate of protecting and managing mangrove forests, is in the provincial government. This in governance policies has relevance to authority, policies, programs, and budgeting. The government's understanding (Housing and Settlement Service), regarding the presence of mangroves in urban areas is a problem that has an impact on reducing mangrove area significantly. The government's focus on managing environmental issues is low. Implementers are less focused on environmental issues, one of which is due to high rotation, weak data and information, all of which have an impact on the planning of the potential for various sustainable policies and programs not yet a priority. Governance in the form of allowing the conversion of mangrove forests to various human activity facilities results in the destruction of the forest, which implies an inability to maintain the existence of urban mangrove forests, contributing to the loss of one of the urban mangrove forests in Indonesia [25].

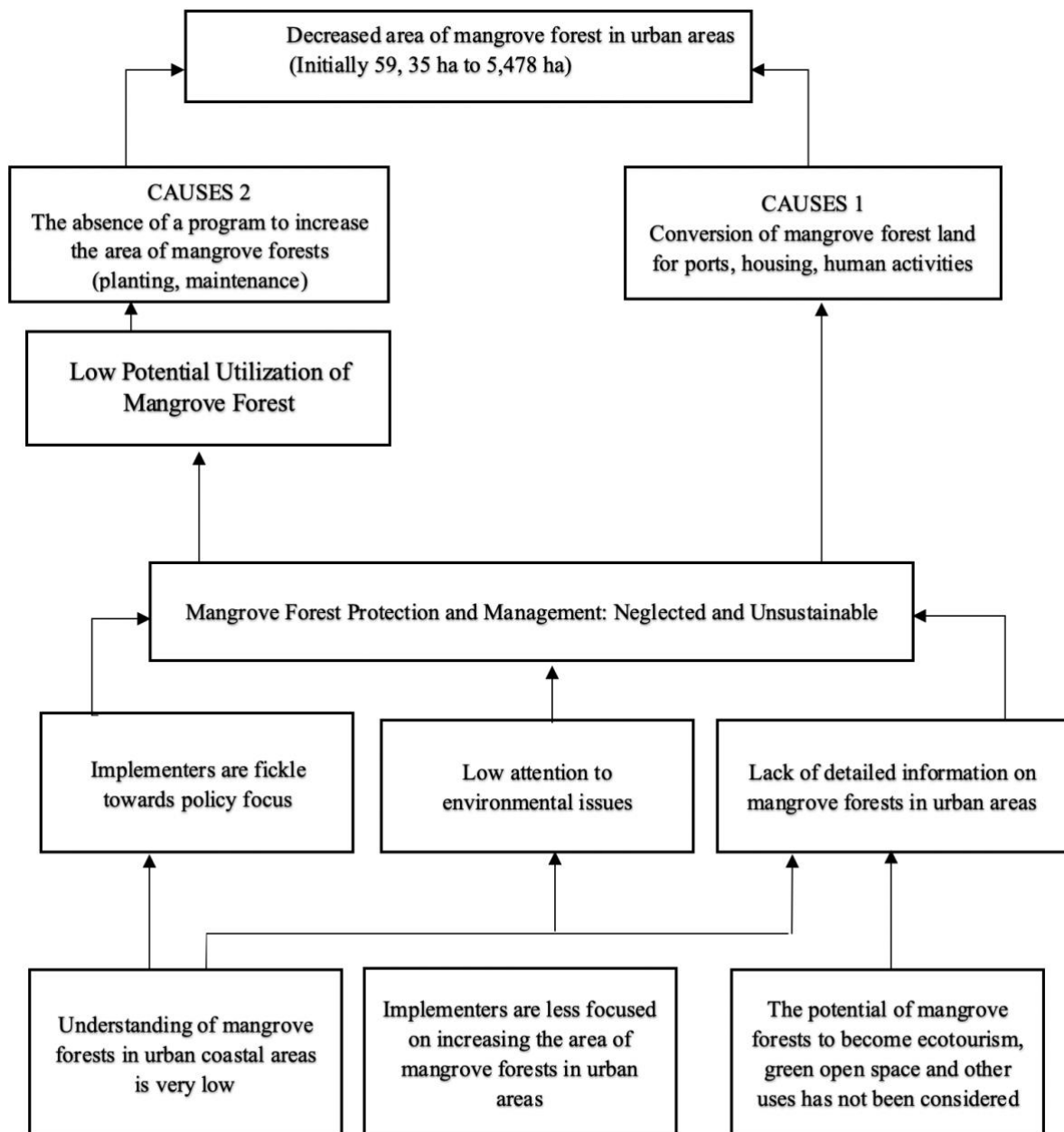


Figure 2. Problem analysis

3.2.2. *Regulatory mapping.* Mapping of regulations can be done to review a regulation in order to improve the quality of existing regulations, so that the policies taken can hit the target [26]. Regulations related to mangroves in Karang City are regulated in national to regional policies. The governing regulations are Law No. 27 of 2007, Regional Regulation of the Province of Lampung No. 1 of 2018, and Regional Regulation of the City of Bandar Lampung No. 10 of 2011. The success of the mangrove forest policy in Karang City can be seen in table 1.

Table 1. Mapping of 3 Relevant Policies for Management and Protection of Mangrove Forest in Karang City

No	Policy	Substance / Analysis
1	UU. No. 27 Tahun 2007 tentang Pengelolaan Wilayah Pesisir dan Pulau-Pulau Kecil (UU. No. 27 of 2007 concerning the Management of Coastal Areas and Small Islands)	<ol style="list-style-type: none"> 1. Formation of the Zoning Plan for Coastal Areas and Small Islands (RZWP3K) with the aim of protecting, dividing, utilizing coastal areas and small islands for the ecosystem in a sustainable manner. 2. Strengthen the role of the community and government institutions for the management of coastal areas and small islands. 3. The basis for local governments to make policies related to zoning for coastal areas and small islands.
2	Peraturan Daerah Provinsi Lampung No. 1 Tahun 2018 (Lampung Provincial Regulation No. 1 of 2018)	Provide confirmation that Kota Karang mangroves are included in a coastal park area, and their development is used for the development of science, research, education and ecotourism.
3	Peraturan Daerah Kota Bandar Lampung No. 10 Tahun 2011 (Bandar Lampung City Regional Regulation No. 10 of 2011)	Contains spatial plans for mangroves including other protected areas, coastal border areas, and Green Open Space (RTH)

Analysis of the implications of three policies: Policies at the national level related to mangroves serve as guidelines for determining zoning plans in coastal areas and small islands. Derivative national policies are regional regulations that are stipulated by each region in Indonesia and are guided by national-level policies. The zoning determination of areas on the coast and small islands in each area is based on the characteristics of each zoning. Coastal park zoning is a stipulation in the zoning plan at the provincial level. Coastal parks have the attraction of living natural resources so that their existence is in the conservation status of coastal areas and small islands. The status of mangroves as a conservation area is in line with the rules of the RTRW of Bandar Lampung City which classifies mangroves as other protected areas. The determination of the status of the area has not been written in the RTRW, so that mangroves in Karang City are classified as “coastal border areas and green open spaces”. Mangroves as coastal parks in urban areas can also become ecotourism so that their existence supports the increase of green open space in Bandar Lampung.

Policies related to the determination of mangroves nationally are regulated in Law Number. 27 of 2007 concerning the Management of Coastal Areas and Small Islands. This national policy has accommodated the interests of the parties who are the implementers of the policy. The purpose of a national policy regulation is to protect mangroves and empower communities. The policies in place include the prevention of mangrove conversion. The first attempt is made by prohibiting the use of methods and methods that damage the mangrove ecosystem in the utilization of coastal areas. The second is to prohibit the conversion of mangrove ecosystems in cultivation areas or zones that do not take into account the sustainability of coastal ecological functions. This regulation is a regulation that is national in nature, so that in its implementation there are derivative regulations.

The mangrove ecosystem in the regulations is classified as a Coastal Conservation Area and Small Islands (KKP3K) and is included in the type of coastal park. Kota Karang Teluk Betung Timur has the code KKP3K-TPM-1. This provincial-level regulation contains the main programs and priority activities regarding the plan for coastal conservation areas and small islands. This plan contains several programs and activities. The programs carried out include strengthening institutions, drafting supporting

regulations for coastal areas and small islands, empowering communities, as well as monitoring and evaluating the management of coastal conservation areas and small islands. The program implementation matrix is scheduled to be implemented in the 2019-2032 period. This program receives funding from the APBN (National Revenue and Expenditure Budget), APBD (Regional Revenue and Expenditure Budget), and the private sector. The implementing agencies for the coastal and small island conservation plan based on the Perda are the Marine and Fisheries Service, the Public Works and Spatial Planning Service.

The policy at the regional level, especially Bandar Lampung City, has not specifically included Kota Karang mangroves as other protected areas. The Bandar Lampung regional regulation classifies other protected areas as mangroves, mangroves, and seagrass beds. Other protected area management regulates area management direction. Management directives include prohibitions against damaging mangrove ecosystems. The activities allowed in the area are tourism and research. The spatial planning carried out by the city government of Bandar Lampung regarding the mangrove area is not spatially determined.

All of three regulations are the basis for the implementation and management of the Kota Karang's mangrove forest, but based on the results of interviews and research on various programs, it is found that the capacity and commitment of the city government is still low. Some of the findings include: The City Government does not yet know its duties as an implementer and does not see mangroves as the focus of ecological development, mangrove development programs through the potential of Green open space (RTH) and tourism have not been implemented. On the other hand, the Regional Government of Lampung Province actually shows the opposite condition. The government's commitment has been realized by formulating policies related to mangroves as derivatives on a national to regional scale. Policies that regulate mangroves in Lampung province related to mangroves and coastal areas are realized with policies up to development directions. The success of planting carried out in several mangrove locations showed an increase in area. The capacity of the provincial government in carrying out the authority of mangrove management in macro is high.

3.2.3. Stakeholders analysis. Stakeholder analysis is carried out to understand the scope of the institution, the roles of relevant actors and key policy holders that determine the course of a policy at the formulation and implementation levels, starting from the central, provincial, to local governments [27] [28]. Their influence and importance will have an impact on the management of mangrove forests in Kota Karang. Stakeholder analysis can be seen in Table 2.

Table 2. Mapping the roles of stakeholders.

Actors	The Role of Formulation	Implementation Role	Interest	Action
Key stakeholders				
Public service unit of Marine Affairs and Fisheries (DKP), Lampung Province	Conducting mangrove forest policy formulation in Lampung Province	Conduct monitoring, work coordination, work activities related to mangrove forest management in Lampung Province	Making policies regarding the allocation of funds and the location of mangrove forests in Lampung Province	Planting mangroves in several mangrove forest locations in Lampung Province
Lampung Provincial Forestry Service	Making suggestions regarding the location of mangrove forests in Lampung Province	Coordinating work with the DKP of Lampung Province	Carry out rehabilitation related to mangrove forest damage in Lampung Province	Planted mangroves in several locations designated as mangrove forests in Lampung Province
Public service unit of Marine	Planning mangrove forests for tourism in	Coordinating work with Disperkim for	Establishing mangrove management activities as ecotourism in the	Making ecotourism work plans in the

Affairs and Fisheries, Bandar Lampung	the city of Bandar Lampung	mangrove objects as ecotourism	city of Bandar Lampung	mangrove forests of Bandar Lampung City
Housing and Settlement Service of Bandar Lampung	Arrange a location in the city of Bandar Lampung which is included in the mangrove forest according to the RTRW	Determine the mangrove forest area in the city of Bandar Lampung	Sufficient and mapping the location of mangrove forests in the city of Bandar Lampung	To build and repair facilities, facilities and infrastructure for mangrove forest locations
Community		Establishing a management team at the mangrove forest location in Karang City	Acting as the target group at the location so that the presence of mangroves can support income	Maintain the location so that the mangroves are not converted into settlements, ports, and other activities.
Supporting stakeholders				
Marine and Fisheries Ministry	Prepare guidelines for the use of mangrove forests	Conduct monitoring related to mangrove forest management	Make decisions regarding how the location can be used as a mangrove forest	Encourage the development of mangrove forest facilities
NGO (Walhi, Mitra Bentala, andTangan)	Contributing to making proposals related to policies to determine the expansion of mangrove forests	Carry out activities related to saving mangroves in collaboration with the government	Provide information to the surrounding community regarding the importance of mangrove forests	Contributing to counseling and planting mangrove forests in Karanh City

Based on the table above, stakeholders play different roles. Stakeholders who have influence and interests are divided into 2, namely:

1. The main stakeholders are those who make policy actors, groups who are directly affected by the positive or negative impacts of the mangrove management policy of Kota Karang, including the Lampung Province Marine and Fisheries Service, the Lampung Provincial Forestry Service and the Bandar Lampung City Housing and Settlement Service and the community;
2. Supporting stakeholders are intermediaries in assisting the process of realizing the Mangrove Policy in Karang City. Among them are the Ministry of Maritime Affairs and Fisheries and several NGOs, including: Walhi, Mitra Bentala, and Tangan.

The existence of guidelines for the preparation, determination, and utilization of mangrove forests nationally is regulated by the Ministry of Marine Affairs and Fisheries, which is a supporting stakeholder, so that this plays a major role in the formulation of national mangrove forest policies. These guidelines form the basis for local governments to implement derivative policies and their implementation. Meanwhile, non-government NGOs run outreach programs to the community about the importance of the existence of mangrove forests, so that people have awareness to protect the mangrove forests in these locations.

Meanwhile, Key Players include: the Department of Maritime Affairs and Fisheries of the Province of Lampung, the Forestry Service of the Province of Lampung and the Department of Housing and Settlements of the City of Bandar Lampung, holding the key policies for the success of the protection and management of the city's mangrove forests. Collaboration between stakeholders is a priority in successful implementation. Some of the collaborative actions among key stakeholders are as follows:

1. Department of Marine Affairs and Fisheries of Lampung Province, with the authority to manage mangrove ecosystems in Lampung Province, including mangrove locations in Karang City. Important role as implementer, facilitator, and conduct cost planning related to advanced management.
2. The Lampung Provincial Forestry Service acts as a facilitator and collaborates to plant and utilize mangroves in urban areas. Collaboration with DKP can save the remaining mangroves

in the city of Bandar Lampung. Collaborative policies that involve the Forestry Service in managing mangrove forests need to be done so that the Forestry Service has the responsibility to protect mangrove forests on urban coasts.

3. Collaboration between the Bandar Lampung City Marine and Fisheries Office and the Bandar Lampung City Housing and Settlement Service is key to policy. Planning related to mangrove forest management in Karang City has been prepared by the DKP of Bandar Lampung City to become an ecotourism location whose existence can be directed towards increasing Green Open Space (RTH) in Bandar Lampung City. The Housing and Settlement Service must play a role in establishing a Regional Regulation that the location of mangrove forests in Karang City is included in the RTRW so that the existence of mangrove forests does not experience a decrease in area because their status is recognized by RTRW. The RTRW designation of mangrove forests will support the policy of mangrove forests as protected areas and can be managed by local agencies where mangrove forests are located. The city agency of Bandar Lampung acts as the implementer regarding the implementation and development of mangrove forests on urban coasts so that the existence of mangrove forests can increase in size and experience protection and sustainable management.
4. Communities including non-governmental NGOs play a role as actors in carrying out efforts to manage mangrove forests in Karang City. The local community and several NGOs such as Walhi, Mitra Bentala, and Tangan have an interest and role in planting and conserving mangrove forests. Non-government NGOs carry out activities in the form of outreach to the community about the importance of the existence of mangrove forests, so that people have awareness to protect mangrove forests in these locations. The roles of both are in accordance with the social forest program, forest management starts from upstream to downstream, starting with nurseries and land management, maintaining and supervising, this will be effective if done directly by the community.

3.2.4. Policy Development Options. The choice of policy development is based on inaccurate implementation of national policies related to mangrove forest management and protection. Starting from an analysis of the costs and benefits of urban mangrove forests, both directly and indirectly, the choice is made by prioritizing the benefits and costs of managing and protecting sustainable mangrove forests through policy options for developing mangrove forests into ecotourism and green open spaces [29,30,31].

Several research studies specifically conducted in Brazil, Zanzibar and Vietnam describe the development of urban coastal mangrove forests as a vehicle for eco-tourism and eco-eduturism for urban communities. The impact felt in these 3 countries is the creation of jobs and increased welfare for the surrounding community [32]. A study in the Pagar Alam area, South Sumatra, illustrates that forest rehabilitation supports the preservation of traditional houses, which is one of the cultural-based tourism. Forest rehabilitation has relevance to the cultivation of the types of wood used as raw materials for the manufacture of traditional houses [33].

Mangrove forests on the urban coast, if managed into ecotourism, will provide results from the benefits of environmental services owned by mangrove forests, creating jobs and increasing welfare for the surrounding community. The costs to be incurred are in the form of policy implementation costs, in the form of building facilities and facilities. The cost of facilities and facilities is incurred by the state because the management to be built involves a cross-institutional planning program which is a transitional cost from the value of unused resources, considering that policies for resource reallocation costs such as rehabilitation and replanting of mangroves that have been logged by the surrounding community are not implemented [34].

Studies conducted in several countries as best practices such as in Indonesia, Bangladesh, as well as a study of the future of urban mangroves conducted in Asia, the United States of America, illustrates overcoming the damage caused by allowing the conversion of mangrove forests that have damaged the

environment to be done through changing the face through protection of the remaining mangrove forests through one of the green open space models [30, 34, 35]. Rehabilitation of mangrove forests has expanded the area and will certainly be able to increase the need for green open space in the Bandar Lampung city which currently has only reached 21%. Likewise, the management of mangrove ecotourism will support the availability of green open spaces and green lanes in urban coastal areas.

4. Conclusion

The choice of policy development to protect and manage mangrove forests in urban areas is carried out through ecotourism policies and making mangrove forests a green open space. Collaboration of stakeholders including the Department of Marine Affairs and Fisheries of Bandar Lampung City and the Department of Housing, Settlements of Bandar Lampung City and the Forestry Service of Lampung Province is an effort to create smart regulation.

Several levels for the effectiveness of policy development that are needed are (a) evidence-based data development and selection of appropriate analytical methods as a basis for policy analysis; (b) public education; (c) Increasing government commitment through policy integration; (d) Together with NGOs to carry out a movement to replant mangrove forests.

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