Mangrove Forest: Analysis of Regulatory Impact (Studies in the Coastal Zone of the City of Bandar Lampung)

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Mangrove Forest: Analysis of Regulatory Impact (Studies in the Coastal Zone of the City of 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 regulatory impact analysis with the stages of problem analysis, regulatory mapping, and stakeholder analysis and determines policy development. 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.

Keywords: Mangrove Forest Policy, Impact Regulation Analysis, Policy Quality, Smart Regulation

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, 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]. 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].

Studies conducted regarding the current condition and existence of mangrove forests in various parts of the world illustrate both opportunities and threats. The study using an environmental economics perspective [14] illustrates the contribution of US $ 200-900 thousand from the economic benefits contained in one hectare of mangrove forest area. These benefits are obtained from production 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 sea water 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]

Many studies link 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 in accordance with 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 / regulations 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 alternative choices 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 policy makers 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 were collected using in-depth interviews from informants consisting of: Ministry of Public Works, Housing and Settlement Service, Marine and Fisheries Service, Forestry Service, Tourism Office, Village Government, NGOs and community groups.

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 in accordance with 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 fresh water sources in the mangrove area. Kelurahan 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. The location of Karang City can be seen in Figure 1.

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]. This reduction in mangrove forest area occurred due to the change in the function of mangrove land as a port, housing, and other human activities. 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 2.

The analysis in Figure 2 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].

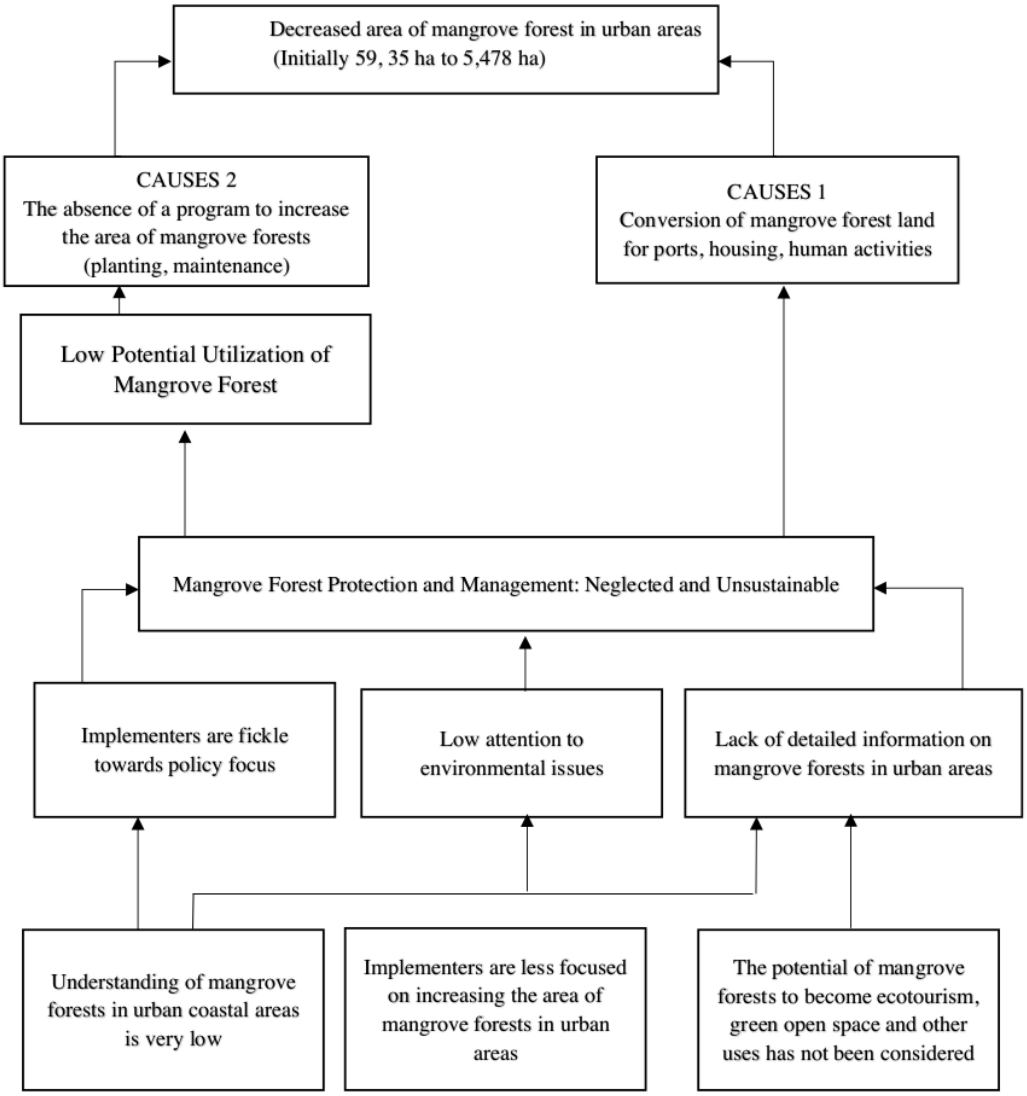

Figure 2. Problem analysis

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)	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 in 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.

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
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
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 Affairs and Fisheries, Bandar Lampung	Planning mangrove forests for tourism in the city of Bandar Lampung	Coordinating work with Disperkim for mangrove objects as ecotourism	Establishing mangrove management activities as ecotourism in the city of Bandar Lampung	Making ecotourism work plans in the 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.
NGO (Walhi, Mitra Bentala, dan Tangan)	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

Stakeholders of the remaining mangrove forests in the city of Bandar Lampung involve several actors in it. The existence of guidelines for the preparation, determination and utilization of mangrove forests nationally is regulated by the Ministry of Marine Affairs and Fisheries (MMAF/KKP), so that the MMAF/KKP plays a high role in the formulation of mangrove forest policies nationally. These guidelines form the basis for local governments to implement the implementation of national policies established by the MMAF/KKP.

Some of the Key Player collaborations include: the Lampung Province Marine and Fisheries Service (DKP), the Lampung Provincial Forestry Service and the Bandar Lampung City Housing and Settlement Service, holding key policies for the successful protection and management of urban mangrove forests as follows:

a. The Office of Marine Affairs and Fisheries (DKP) of Lampung Province, with the authority to manage mangrove ecosystems in Lampung Province, including mangrove locations in Karang City. An important role as implementer, facilitator, and carry out the design of costs related to advanced management.
b. 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.
c. 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.
d. Communities and NGOs (non-governmental organizations) 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 preserving mangrove forests. Non-governmental NGOs carry out activities in the form of socialization to the community about the importance of mangrove forests, so that people have the awareness to protect the mangrove forests in that location.

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].

Mangrove ecotourism policy on urban coasts can function as a vehicle for ecotourism and eco-tourism for urban communities. This will have an impact on creating jobs and increasing welfare for the surrounding community [32]. . 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 [33][34]. Meanwhile, there is damage due to the neglect of mangrove forest conversion that has damaged the environment by protecting the remaining mangrove forest areas through the RTH policy in the city of Bandar Lampung [35]. The mangrove forest which has expanded due to mangrove rehabilitation can increase the need for green open space in the city of Bandar Lampung, which currently has only reached 21%. Mangrove ecotourism management will support the availability of green open space and green lines 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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