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THE POLICY CHALLENGE OF PRIVATE LAND MANAGEMENT FOR CONSERVATION OF YELLOW-CRESTED COCKATOO AND ITS HABITAT IN MASAKAMBING ISLAND, INDONESIA

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Abstract

Yellow-crested small cockatoo (*Cacatoa sulphurea abbotti*) is an endangered species lives in residential area with private ownership in Masakambing Island, Sumenep Regency, East Java, Indonesia. Recently, the population only remain between 22-25 birds. Their habitat requires 3 important trees to support their living: nesting trees, sleeping trees and feeding trees. However, conservation efforts is not easy, as they share space for living with human, while in a small island, land is scarce, and available resources are limited. Therefore, its conservation effort need community involvement. Generally, sharing access to the land resources are intended to social and economic aspects. The study aimed to find out the distribution of important trees as habitat for yellow-crested cockatoo and propose land management policy in supporting conservation activities of yellow-crested cockatoo in Masakambing. The analysis uses qualitative method with interactive model. The results showed that 90% of the yellow-crested cockatoo habitat was in a residential area with private ownership. The Private Land Conservation policy with conservation easement approach can be implemented to conservation of yellow-crested cockatoo in Masakambing. Unfortunately, the Private land Conservation Policy and conservation easement approach have not been regulated clearly.

Keywords: Conservation; Cockatoo; Masakambing Island, Conservation Easement

A. Introduction

Indonesia is rich in biodiversity, and has numbers of animals and plants categorized as protected and endangered species. Referring to Government Regulation No 7/1999, there are 221 animals and 73 plants that listed as protected. One of them is yellow-crested cockatoo, an endemic species living in Masakambing Island, Kecamatan Masalembu, Sumenep Regency, East Java Province, Indonesia. This species has unique character, with its small body compare to usual cockatoo. Living in a small island in Masakambing, this species should shares limited space and resources with inhabitants, and unfortunately, this place is not a conservation area, make it more difficult in designing conservation program to protect this species. In Indonesia, according to Act No.5/1990. conservation area is divided into 2 (two) categories: Nature Reserves (KSA) and Nature Protection Area (KPA). KSA is an area with certain characteristics, on land and in water, having main function as a preservation area of diversity of plants and animals and their ecosystem and as a life support system. KSA consists of nature reserves and wildlife reserves. On the other hand, KPA is an area with certain characteristics, on land and in water, that have the function to protect life support system, preserve plant and animal

diversity, as well as sustainable use of biodiversity and its ecosystem. KPA consists of National Parks, Grand Forest Parks and Nature Tourism Parks.

In Masakambing, yellow-crested cockatoo has to share living space with the inhabitants, who owned the land with private ownership. Some efforts have been implemented to preserve its existence, but unfortunately, it has not shown expected results yet. Recently, the population of small yellow-crested cockatoo only left 22 to 25 species, and is threatened to continue to decline. Generally, population decreasing of endangered species are caused by expansion of agricultural land, over-exploitation of natural resources, urbanization, industrialization, pollution, fires, the presence of other species (exotic species), genetically modified organisms (GMOs), climate change, illegal trade, changes in habitat situation, limitation of habitat range (Castelletta, et al 2005 and Zegeye. 2016). In the case of Masakambing Island, the threat of yellow-crested cockatoo population is due to the decreasing area and quality of its habitat.

Discussion about endangered species conservation is important. Endangered species in the wildlife include yellow-crested cockatoo is one of ecosystem element as part of the concept of Sustainable Development Goals (SDGs). This concept is a reference of the Millennium Development Goals (MDGs) that has been ratified as the goal of Indonesia's development. More clearly, Chen, et al (2019) states the existence of ecosystems will provide services that has benefit for humans both directly and indirectly related to ecological processes, energy and information. This is in line with the theory of "sustainability development" which states the success of development can be achieved when the community obtain the benefit from resources both abundant and scarce (Odum 1971).

Conservation efforts need to be conducted immediately involving not only by biological technique approach but also multidimensional approaches. Sodhi, et al (2011) and Bennet, et al (2017) stated that conservation activities of protected animal are not related to individual animal only but correlated to habitat management. Discussion about habitat of yellow-crested cockatoo will strongly related to land and space management of Masakambing Island. However, this discussion become more challenging since the area of Masakambing is owned by individual ownership. Moreover, limited space and natural resources, as characterized by small island like Masakambing, put more pressure on its conservation effort.

When a conservation area shared location with residential area, conservation program should be designed in a more careful way. The greatest threat of conservation of protected species when blend in resident is the degradation of habitat caused by livestock grazing, predators, fires and clearing of endemic vegetation (Smith et al. 1994, 315-338). Even though the farming approach has been applied, without integrated management of farming activities, it will harm conservation activities (Saunders 1994). Specifically, in conserving bird species, the provision of nesting trees need long duration despite it has been conducted by good spatial planning and coordination and supported by the community (Manning. 2004). Basically, it needs a big role relatively in vegetation structure, environmental control and good land management for bird conservation efforts Daniels and Kirkpatrick (2006)

The policy of land management has significant affect for conservation efforts in both public and private lands (Merenlender, et al. 2004). Considering the importance of land management for conservation, Gary, et al (2019) spesifically have identified the location of animals, it is contributed to the land management policies for conservation efforts. The habitat of yellow-crested small coccatoo needs 3 important trees, consist of nesting trees, feeding trees and sleeping trees, and is separated each other as different trees. The aim of the study was to find out the description of the distribution of important trees as habitat for yellow-crested small cockatoo and propose land management policy in supporting conservation activities of small-crested yellow cockatoo in Masakambing Island.

B. Methods

1. Research Location

The research was conducted in Masakambing Island, located Masalembu Sub-district, Sumenep Regency, East Java Province, Indonesia. It has an area of 7.79 km² and located in Java Sea. The geographic location is 5042 '- 5047' south latitude and 114039 '- 114045' east longitude. Administratively, Masakambing Island is divided into two sub-village: Ketapang and Tanjung.

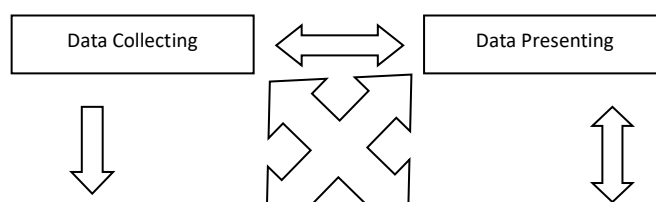
2. Data

The data used in this research are primary and secondary data that obtained from observation, interviews and literature studies. Interviews were conducted to the key informants, consist of conservation figure of yellow-crested small cockatoo in Masakambing Island, the village government of Masakambing Island, The Agency of Natural Resources Conservation of East Java (BBKSDA of East Java), Non-Government Organization of KKI-IPP (Indonesian Parrot Conservation Project), and the Research and Development Center of Ministry of National Land Agency/ Agrarian and Spatial Planning.

3. Data Analysis

The analysis uses a qualitative analysis approach. It is conducted by examining and interpreting non-numerical observation data to find the meaning and patterns of fundamental relationships (Babbie, 2012). Qualitative analysis model uses an interactive mod

Figure 1. Qualitative Analysis with Interactive Model



(Source: Miles, et al (2014))

C. Results and Discussion

1. *Distribution of An Important Trees for Yellow Crested Cockatoo*

Small yellow-crested cockatoo requires at least 3 types of trees for their living environment: nesting, feeding and sleeping trees, and these trees are different from each other. The nesting tree is a tree used by the birds for breeding, from laying eggs and taking care of the chicks. The birds will make a hole in a fractured branch, usually a decayed branch – or sometimes a hole that has been left by other birds. This hole is usually made by the couple of birds before mating. The trees that are used by the birds for nesting have characteristics as follows:

- a. fracture of dead tree or weathered tree or tree cracks.
- b. height range from 8-25 meters.
- c. Diameter of 28-105 cm.
- d. located on a stem or branch at a height of 6-15 meters from the ground.
- e. the diameter of hole is round or oval with a diameter ranging from 12-23 cm.
- f. the depth of the hole is 68 cm and the base of hole are wood chips and leaf fragments with thickness is 10 cm.

There are several types of trees that can be used as nesting trees, but currently the active nesting trees are breadfruit, kapok, coconut, tamarind and magnifera. At present, there are 9 active nesting trees; 1 located in mangrove area and 8 of them located in plantations area and residential area. These nesting trees are concentrated in the Ketapang sub-village.

Meanwhile, feeding trees consist of fruit trees, seeds and flower nectar. Each species has a different level of consumption for yellow-crested cockatoo. Based on the results of the KKI-IPP study, palm fruit was consumed at the highest level during the breeding period. Meanwhile, coconut trees were consumed at the highest level during the non-breeding period. These trees are spread along the island, in mangrove, plantation and residential area in the Ketapang and Tanjung sub-village. But, at present, the movement of yellow-crested cockatoo in the searching of food in the Tanjung sub-village is lesser than before.

Sleeping trees are the trees that are used by yellow-crested cockatoo in the non-breeding period. Sleeping trees are dominated by coconut trees, and only 1 magnifera tree that is located in the mangrove area is used by the bird for sleeping tree. It can be concluded that the sleeping trees will be close to the tall and deciduous trees. These trees are used by yellow-

crested cockatoo to monitor surrounding condition to ensure its safety and comfortability. Based on the distribution, the area of sleeping trees concentrated in the Ketapang sub-village only.

Based on an inventory that conducted by (KKI-IPP 2013), interview with conservation leader in Masakambing Island and the observations, there are 14 species of trees that used by yellow-crested cockatoo for nesting, sleeping and feeding. One type of tree can have single or more then one functions. The distribution of functions of trees type is presented in table 1, while the distribution of the trees is shown in figure 2.

Table 1. The Important Tree Specieses For Yellow-Crested Cockatoo in Masakambing Island

No	Jenis Pohon Penting	Fungsi		
		Nesting	Feeding	Sleeping
1.	Coconut	■	■	■
2.	Breafruit	■	■	■
3.	Kapuk randu	■	■	■
4.	Tamarind	■	■	■
5.	Kedondong	■	■	■
6.	Star Fruit	■	■	■
7.	Galompe	■	■	■
8.	Palm	■	■	■
9.	Rumbia	■	■	■
10.	Moringa	■	■	■
11.	Duluk-duluk	■	■	■
12.	Tanjang	■	■	■
13.	Pidada	■	■	■
14.	Magnifera	■	■	■

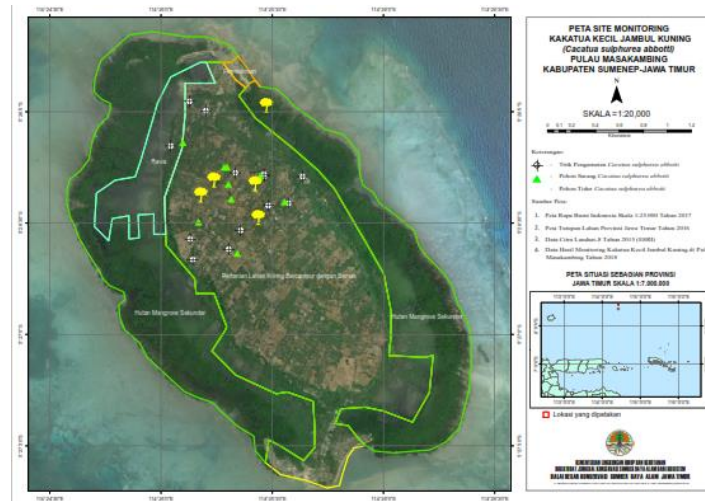
Source: KKI-IPP (2018)

Currently, the existence of these species of the important trees are threatened by the introduction of new commodity that is cultivated by the inhabitant, that is clove. This commodity is cultivated widely because it has high economic value, although it requires a high input intake (fertilizer, pest and disease control and irrigation). In fact, commodities with high input intake will damage the ecological system that has been exist (Kiley-Worthington, 1981). On the other hand, the introduction of new commodities need much attention related to the existing of environmental conditions. Even , crop cultivation that is oriented to generate income, should be able to facilitate the protection of typical biodiversity (Khoury. Et al. 2019a). Unfortunately, this condition become a global problems, not only in Masakambing Island. (Khoury Et al, 2019b) found that agricultural cultivation in most countries and regions still did not meet conservation priorities.

The distribution of important trees for the life of yellow-crested cockatoo in Masakambing Island is more concentrated in Ketapang sub-village. It is caused by vegetation

condition in Ketapang is better compare to Tanjung, due to the expansion of settlements and land conversion for other purposes. This expansion is mainly related with the increase of population in Masakambing. Recorded in 2012, the population of Masakambing are 1,115, and increased into 1,365 in 2017. Other land use change also occurred due to land clearing in mangrove area for shrimp and milkfish ponds.

Figure 2. The Distribution of Important Trees for Yellow-Crested Cockatoo in Masakambing Island



(Source: The Agency of Natural Resources Conservation of East Java, 2018)

This condition becomes significantly alarming if land management to support habitat protection is not being conducted immediately. Tight protection of the area from damage through appropriate zoning will support conservation programs (Calado, et al. 2014). Moreover, Masakambing Island as a small island has high vulnerability. Nurse et al, (2001) stated, the vulnerability and insularity of small islands are caused by geographical limitations of natural resources, water resources, infrastructure and human resources.

2. Land Management Policies of Yellow-Crested Cockatoo Conservation and its Habitat

Indonesia already implemented policy of conservation activities as regulated by Act No 5/1990 concerning the Conservation of the Biodiversity and its Ecosystems. The law states that conservation activities consist of protection, preservation and utilization, and can be conducted in the area of the Nature Reserve Area (KSA), which consists of nature reserves and wildlife reserves. Moreover, they can also be conducted in the Nature Protection Zone (KPA), which consists of National Parks, Grand Forest Parks and Nature Tourism Parks. Unfortunately, this regulation is hardly applicable in the habitat of yellow-crested cockatoo in Masakambing Island, where almost all land were possessed by private ownership.

Likewise, the policy of PP 7/1999 concerning Preservation of species of animals and plants still faces obstacles. In this policy, preservation activities are directed including

identification, inventory, monitoring, habitat and population development, species rescue, research and development. In the case of conservation of yellow-crested cockatoo in Masakambing island, the habitat development activities will be constrained by land ownership.

A more general and more possible policy to be implemented is Act no 26/2007 regarding spatial planning. In this Act, spatial planning can be directed in favor of the conservation efforts of yellow-crested cockatoo and their habitat. Through this regulation, the structure, pattern, arrangement and implementation of the land (in spatial perspectives) will be framed on the effort to conserve yellow-crested cockatoo and their habitat.

Furthermore, through PP 15/2010 regarding the implementation of spatial planning, the focus will be on providing policies related to the conservation of yellow-crested cockatoo in Masakambing Island. Through this regulation, Masakambing Island can be determined as a national strategic area. National strategic area is a region whose spatial planning is prioritized because it has a very important influence nationally on state sovereignty, national defense and security, economic, social, cultural, and/ or environment, including areas that have been designated as world heritage. Considering that yellow-crested cockatoo is classified as one of the 25 national priority animals, in accordance to SK Dirjen PHKA No. 200/ IV / KKH / 2015, it is possible to establish Masakambing Island as a protected area or national strategic area. Likewise, this animal has become a world concern where IUCN has placed as critically endangered species. Through this stipulation, it is hoped that the program and funding will get better attention.

Unfortunately, the regulation facilitation has not been able to be utilized yet maximally by the Sumenep Regency Government. The Government of Sumenep Regency through the Regional Regulation of Sumenep Regency Number 12 /2013 concerning Spatial Plan (RTRW) of Sumenep Regency has not yet accommodated to the interests of the Masakambing Island region as conservation of yellow-crested cockatoo. The policies and spatial planning of Sumenep has not been favor of yellow-crested cockatoo and its habitat conservation. This regulation only mentioned on the increasing of coastal and small island ecosystems conservation.

In fact, the village government of Masakambing Island established policy through Village Regulation No. 1/2009 concerning Protection of yellow-crested cockatoo and their habitat. This rRegulation stated that there are rights, obligations and participation of the Masakambing Island village community in protecting yellow-crested cockatoo and their habitat. The regulation also mentions the prohibition for not having, storing, trading and carrying out yellow-crested cockatoo and it parts. The regulation also regulates habitat protection for the birds. The removal of nesting trees and feeding trees of yellow-crested cockatoo are prohibited, and the regulation clearly mentioned the trees species in detailed. Explicitly, the regulation also mentioned sanctions in the form of money and other.

3. The Proposal of Land Management Policy for the Yellow-crested cockatoo and its Habitat Conservation

It is difficult to set up Masakambing as a conservation area in a whole, since all of land in this island is owned by people with private ownership. Moreover, limited land and natural resources available, aggravated by the need of the people for livelihood, make conservation effort become more challenging. A sharing living space for the people and the birds should be designed carefully. However, it is possible to design a conservation program by the concept of Private land Conservation (PLC). According to Capano, et al (2019) PLC is land under private ownership such as individuals, families or other non-public institutions that is managed to support biodiversity conservation goals. Capano also stated that tPLC is useful for (i) increasing all protected areas, (ii) increasing the diversity of stakeholders that involved in making conservation policies, (iii) increasing the connectivity of ecological and socio-economic, and (iv) reducing social conflict. This PLC become a challenge for 11 Aichi Biodiversity targets which states in 2020 at least 17% of terrestrial and inland water areas and 10 % of coastal and marine areas, especially areas that are very important for biodiversity and ecosystem services, need to be conserved through systems that are managed effectively, fairly, representative, well connected and ecologically (Bingham, et al. 2017).

However, in the case of Masakambing the concept of PCL is not solely solve the problems. Conservation management policies on smaller scope still not binding yet and have top-down character. In fact, effective and efficient conservation efforts are suggested to have a bottom-up character that start from awareness and continued with community participation. The review of (Thaman, et al. 2016) explained the bottom-up conservation activities showed better results as happened in Fiji. Likewise, the existing policies still emphasize the prohibition and accompanied by sanctions that seem coercive. In fact, incentive policies need to be implemented to raise awareness and community participation in the conservation of yellow-crested cockatoo and their habitat. This is demonstrated by the success of bird conservation in Ethiopia and Costa Rica has been mentioned that effective dan efficient success use the incentive approach (Sekerciog˘lu. 2012).

Other alternatives that able to accommodate those needs is the concept conservation easement. The topic of conservation easement on PLCs is very popular. (Capano, et al. 2019) reported that conservation easement term is mentioned 508 times in journal abstracts regarding PLCs. This is more compared to the term of landowners that are mentioned 329 times and the program 326 times. The popularity of conservation easement was also discovered at a conference in California. Communities prefer to implement conservation easement because they still can use their land even though certain management rights are restricted (Cheever, 1996).

In fact, conservation of yellow-crested cockatoo and its habitat in Masakambing Island would be very effective revolutionary if all of island area turned into KSA or KPA. But, this is

a difficult choice because many residents will lose land ownership, productive activities and long-established social and cultural roots will be uprooted. The best policy solution is application of conservation easement. Through the conservation easement policy, the community still owns the land but is they restricted to use their land for conservation purposes with consequence community will receive rewards or tax reduction Gustanski and Squires (2000); (Kiesecker, et al. 2007). The principle of conservation easement is voluntary by placing land ownership is permanent on the community, land using for conservation purposes, avoiding high costs and avoiding of socio-political complexity and stability (Merenlender Et al. 2004).

If this policy is applied in Masakambing Island, communities that have important trees for yellow-crested cockatoo can still own and control their land but there are regulations and management restrictions. Consequently, the community who have important trees will get a reward, incentive or tax reduction. This policy has aimed to provide the protection and conservation for the habitat that is needed by yellow-crested cockatoo in Masakambing Island.

The next challenge is the formulation of policy related to the form regulation in a more detailed and clear way. It is needed to carry out study to determine who will carry out conservation easement. (Merenlender et al. 2004) provide several alternative stakeholders that possible to do the conservation easement; such as private institutions, partnership institutions or government on central or regional level. Therefore, to measure the degree of involvement, a stakeholder engagement study is needed. The study is intended to identify stakeholder and the degree of importance and influence on the conservation of yellow-crested cockatoo and its habitat, yet to determine who does what (Reed et al. 2008).

At this time, several stakeholders who have been involved in the conservation of yellow-crested cockatoo and its habitat has been identified: the village Government of Masakambing Island, The Agency of Natural Resources Conservation of East Java (BBKSDAJawa Timur), NGO KKI-IPP. However, it is very possible to propose the Sumenep Regency Government, the Government of East Java Province which have regional authority; and National Land Agency/ Ministry Spatial which has a domain in spatial planning. These stakeholders must be encouraged to participate.

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