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Waqf-based private forest management model: case study in Bogor Regency, Indonesia

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Abstract. *As in Bogor Waqf Forest, a waqf-based private forest management pattern was developed in Indonesia. Waqf currently functions not only for constructing mosques, cemeteries, and orphanages, but also for environmental preservation, known as green waqf. This study analyzed the mechanism of waqf forest development and waqf forest management practices in Bogor Regency. The method used Exploratory research was conducted using primary and secondary data. The informants were selected using purposive sampling. The data were analyzed qualitatively. The results showed that Bogor Waqf Forest Foundation collected donations in the form of zakat, infaq, and waqf (ziswaf) for the development of the Bogor Waqf Forest. In addition, the Bogor Waqf Forest Foundation collaborates with BAZNAS and the Ministry of Religious Affairs to manage Bogor Waqf Forest productively by empowering local communities by forming groups such as the* Berkah Bersama *Group,* Giat Bersama *Group,* Citra Berdikari *Group,* Asri Berseri, *and* Kelompok Tanggap Bencana *(KATANA). Bogor Waqf Forest Management applies agroforestry forest management practices, such as agrosilvofishery, agrosilvopasture, apiculture, and agrisilviculture, which are non-timber product-oriented, namely NTFPs and environmental services.*

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INTRODUCTION

The role of private forests is considered to be very important in line with the rate of deforestation and forest degradation in Indonesia. This has become an opportunity for the development of private forest businesses in Indonesia (Fauzan et al. 2019). A private forest is an alternative supplier of wood that depends heavily on natural forests (Kusuma et al. 2020). Various types of small private forest patterns have been developed, such as government subsidy patterns, non-governmental organizations, and partnerships (Hisma et al. 2015). Currently, waqf-based private forest management patterns have been developed. Waqf, which was previously considered only for the construction of mosques, Islamic boarding schools, orphanages, and cemeteries, is now starting to develop into waqf for various environmental preservation activities known as green waqf. Waqf for environmental preservation has been performed in Kuwait (Setyorini et al. 2020). Waqf institutions in Indonesia have offered many similar programs, such as tree waqf. However, waqf

specifically for private forests is still rare because the forestry business has a relatively long period of time. In addition, the concept of waqf forest development is in line with the concept of waqf in Islamic law, namely, the realization of economic and social benefits (Sup 2021). Even waqf forests provide ecological benefits in the context of environmental preservation.

Waqf forests in Indonesia were pioneered by a group of volunteers in Aceh Province in 2012 to restore critical land (Setyorini et al. 2020). The government of Bandung Regency also launched the Waqf Leuweung Program, which aims to rehabilitate critical land in the upstream part of the Citarum Watershed. The regional government will try to buy critical lands to be converted into waqf forests, the management of which is carried out by empowering the community around the waqf forest (BWI 2013). Bogor Waqf Forest is located in Bogor Regency and is managed by the Bogor Waqf Forest Foundation (Ali and Kassim 2020). Forest development through the waqf mechanism is an alternative solution for overcoming environmental problems, because the function of forests is to prevent landslides (Stokes et al. 2014; Schmaltz et al. 2017), absorb carbon emissions, increase the biodiversity of both flora and fauna (Paul et al. 2016), and create microclimates (Wolff et al. 2018). In addition, forest development can increase people's income (Sadeq 2002) and provide food (Hardjanto et al. 2022).

Research on the waqf forest has begun to be carried out a lot. However, specific research on the mechanism underlying its development has not yet been conducted. Bogor Waqf Forest is the only small private forest developing-based waqf in the Bogor Regency. Previous research has discussed the Bogor Waqf Forest management system, which applies an agroforestry pattern to realize productive waqf management (Jannah et al. 2021). Bogor Waqf Forest is currently progressing, so information about its management practices is very interesting because it can build community literacy about the waqf forest. Private forest management generally produces wood. However, Bogor Waqf Forest has a unique pattern of private forest development because it is only non-timber oriented. Therefore, this study aimed to: (1) analyze the mechanism of waqf forest development in Bogor Regency and (2) analyze waqf forest management practices in Bogor Regency.

METHOD

Study Area

Indonesia has a majority Moslem population, so the potential for waqf is very large. Waqf can be used for private forest businesses. Therefore, waqf-based forest management is an alternative model for private forest that has good prospects in Indonesia. This model has been applied in several places such as Aceh Province and Bandung Regency. Waqf-based private forests in Bogor are considered to be fairly well managed, but the data on management practices are not yet known, therefore it is interesting to carry out research. The research location is in the Bogor Waqf Forest located in Cibunian Village, Pamijahan District, Bogor Regency, West Java Province. The research was conducted on September to December 2021.

Data

Primary and secondary data were used in this study. The primary data consist of waqf administrative documents, such as waqf pledge deeds, profiles of waqf forest managers, waqf forest management activities, reports of waqf forest management, and laws and regulations related to waqf. The secondary data were the biophysical, socioeconomic, and regional demographic conditions at the research location. Data collection was conducted through observations, interviews, and a literature review. Observations were made of the biophysical conditions and waqf forest management activities. In-depth interviews, both face-to-face and online, were conducted to obtain information about managers' profiles and management activities in waqf forests. Informants were selected by purposive sampling consisting of waqf forest managers (*Nazhir*), namely, the Bogor Waqf Forest Foundation, BAZNAS, and waqf forest management groups. A literature study was carried out to find documents and literature supporting research such as biophysical, socio-economic, and

regional demographic conditions, administrative documents, waqf forest management reports, and laws and regulations related to waqf.

Data Analysis

Data analysis in exploratory research uses a qualitative approach oriented toward results or findings, rather than testing theories (Mudjiyanto 2018). This research aims to explore and gather information on relatively new issues or phenomena (Djamba 2002). Qualitative data were analyzed according to the theory of Miles et al. (2014) consisting of three stages: 1) Data reduction, namely the selection and sharpening of data relevant to the research objectives, 2) Data displaying is the simplification of complex data into descriptions or matrixes, 3) Drawing conclusions or verification, namely an understanding of the process in the development of waqf-based private forest and the pattern of productive development of Bogor Waqf Forest.

RESULTS

Mechanism of Bogor Waqf Forest Development

Waqf is a part of the property given by the *waqif* (waqf donor) to be used for the public interest with the principles of Islamic law according to the mandate of the *waqif*. The legal requirement for waqf is the fulfillment of waqf elements such as waqf donor (*waqif*), waqf manager (*nazhir*), waqf property, waqf beneficiaries (*mauquf 'alaihi*), waqf pledge (*ikrar wakaf*), and waqf period (PRI 2004). Waqf forests are established, functioned, and maintained as forests (Ali et al. 2021). The Bogor Waqf Forest was established by raising donations in the form of zakat, infaq, sadaqah, and waqf (ziswaf). Donations in the form of waqf are used to purchase waqf land. Donations in the form of zakat, *infaq*, and *sadaqah* were used for activities related to the management and operational costs of the Bogor Waqf Forest Foundation (*nazhir*). The Bogor Waqf Forest Foundation collaborates with other parties, such as *Badan Amil Zakat Nasional* (BAZNAS) and the Ministry of Religious Affairs, to manage waqf productively (Figure 1).

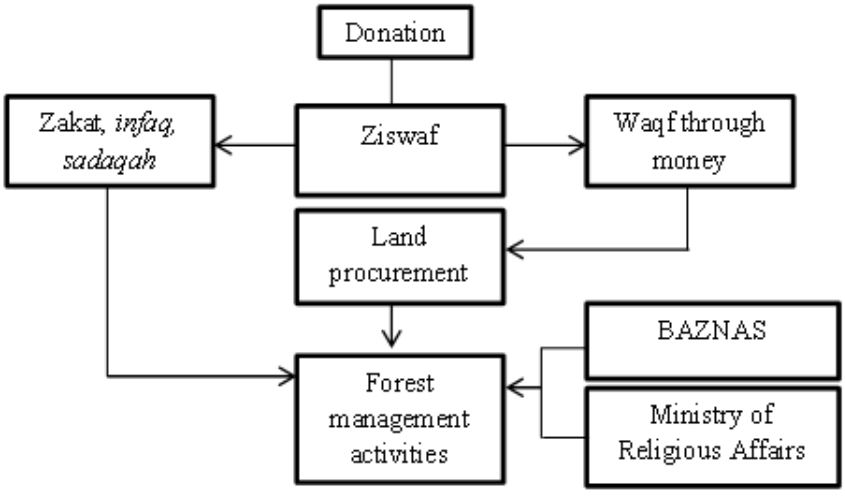

Figure 1 Mechanism of Bogor Waqf Forest development

Productive waqf is the use of waqf assets for production or business activities, whose benefits and profits are channeled for the welfare of society (Zainal 2016). Collaboration programs are related to ecological, economic, and social activities. Ecological activities included planting trees, bee forage, and food plants. These activities contribute to forest preservation and natural disaster prevention. Economic activity empowers local people around Bogor Waqf Forest in the waqf forest business. This activity is expected to

increase the community income. Distributing zakats or compensation to communities around the forest is a form of social activity in Bogor Waqf Forest. The Bogor Waqf Forest Foundation also facilitates the study of Islam for the local people around the Bogor Waqf Forest. In addition, informal education, such as *Sekolah Rimbawan Kecil (Serincil)* or young forester school, is also carried out to raise environmental awareness among children.

The establishment of the Bogor Waqf Forest started with 1,500 squares meters of waqf land in 2018. The waqf land was the pioneer of the waqf forest named Bogor Waqf Forest I. Now, the Bogor Waqf Forest has grown to four locations, Bogor Waqf Forest II (1,200 sqm), Bogor Waqf Forest III (3,830 sq. m), Bogor Waqf Forest IV (1,000 sqm), and Bogor Waqf Forest V (2,000 sqm), whose land procurement was obtained from waqf through a monetary mechanism (Table 1). All waqf forest lands are located in Cibunian Village, Pamijahan District, Bogor Regency, West Java Province.

Table 1 Time, wide, and mechanism of land procurement

Bogor Waqf Forest	Year of establishing	Wide (sq meters)	Mechanism of waqf land procurement
I	2018	1,500	Land waqf
II	2019	1,200	Waqf through money
III	2020	3,830	Waqf through money
IV	2021	1,000	Waqf through money
V	2021	2,000	Waqf through money

Bogor Waqf Forest Management Practices

The activities carried out in Bogor Waqf Forest include seed procurement, land preparation, planting, infrastructure development, maintenance, harvesting, and marketing. Not all lands carried out the activities of the five Bogor Waqf Forest locations. As with Waqf Forests III and IV, the land does not have marketing activities because it is yet to produce products. As for Bogor Waqf Forest V, there were no activities from seed procurement to product marketing because the land was previously a garden and has not been structured as in other waqf forests. The management of the Bogor Waqf Forest follows the dominant type of community forest management in Bogor Regency, which is managed through agroforestry (Safe'i and Sukmara 2019). The agroforestry pattern combines various components, such as forestry, agriculture, fisheries, and livestock, to obtain short-term, medium-, and long-term results. In addition to increasing land productivity, agroforestry patterns are an effort to adjust and mitigate climate change (Butarbutar 2012).

Bogor Waqf Forest generally implements forest management with a complex agroforestry pattern that includes agrosilvofishery, apiculture, agrosilvopasture, and agrisilviculture. Combining these patterns is more profitable than private forest management patterns that only produce timber (Herwirawan et al. 2019). Commodities from Bogor Waqf Forest include Non-Timber Forest Products (NTFPs) and environmental services. Communities still benefit from both commodities without destroying forests (Indrasari et al. 2017). Non-timber forest products produced from Bogor Waqf Forest include fruits, honey, fish, livestock, and food crops. Environmental services can take the form of direct (tangible) and indirect (intangible) benefits. In this study, environmental services refer to tangible benefits that can be physically seen and felt by the community, namely water sources and ecotourism (Table 2).

The agroforestry pattern applied in Bogor Waqf Forest I was apiculture and agrosilvofishery (Figure 2a). Bogor Waqf Forest II also developed a waqf forest with a pattern similar to that of Bogor Waqf Forest I. However, there was a different pattern of agrosilvopasture. However, another pattern was added, namely agrosilvopasture (Figure 2b). Both lands were the earliest to be acquired as waqf lands, so the management patterns applied were already quite good and integrated. Agrosilvofishery and agrosilvpasture patterns are collaborative programs between the Bogor Waqf Forest Foundation and the BAZNAS. The pattern

developed in Bogor Waqf Forest III was apiculture (Figure 2c). Apiculture is a honeybee cultivation program conducted by the Indonesian Ministry of Religious Affairs. It was also implemented in Bogor Waqf Forests I and II. Bogor Waqf Forests IV and V only apply the agrisilviculture pattern because the land was only acquired in 2021; therefore, further program planning is still underway (Figure 2d, 2e).

Table 2 Bogor Waqf Forest management system

Bogor Waqf Forest	Management pattern	Product
I	Complex agroforestry (agrosilvofishery and apiculture)	NTFPs (fruit, honey, fish, crops) and environmental services (ecotourism)
II	Complex agroforestry (agrosilvofishery, agrosilvopasture, and apiculture)	NTFPs (fruit, honey, fish, sheep) and environmental services (water and ecotourism)
III	Apiculture	NTFPs (fruit, honey) and environmental services (ecotourism)
IV	Agrisilviculture	NTFPs (fruit) and environmental services (ecotourism)
V	Agrisilviculture	NTFPs (fruit) and environmental services (ecotourism)

Figure 2 (a) Bogor Waqf Forest I, (b) Bogor Waqf Forest II, (c) Bogor Waqf Forest III, (d) Bogor Waqf Forest IV, and (e) Bogor Waqf Forest V

DISCUSSIONS

Mechanism of Bogor Waqf Forest Development

The Bogor Waqf Forest *waqifs* are individuals from the public. The *nazhir* of the Bogor Waqf Forest is a legal waqf forest manager named the Bogor Waqf Forest Foundation. The Bogor Waqf Forest was managed by the Yassiru Foundation at the beginning of waqf forest development in 2019. In 2020, Bogor Waqf Forest was managed by the Bogor Waqf Forest Foundation, which was formed to manage Bogor Waqf

Forest more professionally. Waqf assets in Bogor Waqf Forest are immovable property in the form of land. The existence of waqf assets has been stated in the Waqf Pledge Deed, which serves as evidence that the ownership of assets has moved from private property to waqf property. Land that has been endowed has an unlimited or perpetual period of time and may not be sold, transferred, or converted into other forms of utilization (PRI 2004). Bogor Waqf Forest is expected to benefit *mauquf 'alaih*, the people of Cibunian Village who live around the Bogor Waqf Forest.

To sustain the existence of the waqf forest, Bogor Waqf Forest Foundation collects donations in the form of zakat, *infaq*, *sadaqah*, and waqf (ziswaf). Waqf managers (*nazhir*) can utilize cash and cashless waqf to manage waqf assets (Ulpah and Jahar 2019). However, the Bogor Waqf Forest Foundation still needs the legality to collect cash waqf. Hence, the foundation continues to build the waqf forest by collecting donations in the form of money, known as waqf through money. Waqf through money means the provision of a sum of money from waqif to be used in procuring waqf assets, both movable and immovable (BWI 2019). Donations were collected from several donors until the funds were sufficient to buy land and then build into a waqf forest. In addition, the Bogor Waqf Forest Foundation is open to receiving waqf in the form of land. Donations in the form of zakat, *infaq*, and *sadaqah* are used to support management activities in Bogor Waqf Forest, such as planting seedlings, building infrastructure, maintenance, assisting residents around the waqf forest, and community empowerment activities.

Indonesian Government Law Number 41 of 2004 mandates that waqf assets should be managed productively to distribute the benefits of waqf more widely. The success of forest management is inseparable from the community's involvement in forests (Aisharya et al. 2022). Therefore, the Bogor Waqf Forest Foundation collaborated with BAZNAS in two programs: Zakat Community Development (ZCD) and Baznas *Tanggap Bencana* (BTB). In addition to BAZNAS, the Bogor Waqf Forest Foundation collaborated with the Indonesian Ministry of Religious Affairs in Trigona honey bee cultivation (Figure 1). This collaboration is a waqf manager's strategy for productive waqf assets, as the Bogor Waqf Forest Foundation still has limited funds to manage Bogor Waqf Forest (Ali and Kassim 2021).

The ZCD program is a village community assistance program conducted by the BAZNAS for up to two years. The group is expected to continue the business independently for the rest of the time. This programme targets zakat recipients (*mustahiq*) to sustainably improve their welfare. The BTB program aims to educate the Cibunian Village community to adapt to and mitigate natural disasters. The group members of both the ZCD and BTB programs come from the community around the waqf forest, which currently has five groups: the *Kampung Tanggap Bencana* (KATANA), *Berkah Bersama*, *Giat Bersama*, *Citra Berdikari*, and *Asri Berseri*.

Bogor Waqf Forest Management Practices

Referring to Law No. 41 of 1999 on Forestry, waqf forests are categorized as private forests, because they are built on private land. The difference is that private forest land is usually privately owned or owned by a business entity, whereas waqf forest land belongs to God and benefits the public interest. Bogor Waqf Forest has characteristics similar to those of private forests on Java Island, which are scattered and relatively narrow (Hardjanto 2017). Unlike community forests, which are generally oriented toward timber products, Bogor Waqf Forest is more oriented towards Non-Timber Forest Products (NTFPs) and environmental services. This is due to several considerations that Cibunian Village is categorized as a very landslide-prone area (Rahayu et al. 2019), so it is prioritized as a protected area by Bogor Regency Regional Regulation Number 19 of 2008.

Management activities in Bogor Waqf Forest I included land preparation, planting, maintenance, harvesting, marketing, and infrastructure development. Land preparation, such as clearing weeds, making terraces, and planting holes, is carried out before planting. The planting pattern does not have a certain distance, but optimizes the growing space. Plant seeds come from purchases and assistance from individuals

and various parties, including the Ministry of Environment and Forestry. The species planted in Bogor Waqf Forest I include pine (*Pinus merkusii)*, *damar* (*Agathis dammara)*, *akasia* (*Acacia* sp.), *sengon* (*Falcataria moluccana*), *nyamplung* (*Calophyllum inophyllum*), gmelina (*Gmelina arborea*), angsana (*Pterocarpus indicus*), mahogany (*Swietenia mahagoni*), jackfruit (*Artocarpus heterophyllus*), guava (*Psidium guajava*), breadfruit (*Artocarpus altitis*), mangosteen (*Garcinia mangostana*), soursop (*Annona muricata*), mango (*Mangifera indica*), banana (*Musa paradisiaca*), coconut (*Cocos nucifera*), chili (*Capsicum annuum*), and leek (*Allium ampeloprasum*). Maintenance activities during fertilization, replanting, and pruning were performed as needed. Manure was used as fertilizer. Replanting was performed if dead seedlings were present. Pruning is only performed if necessary, for example, if some branches or twigs interfere with the path or place for other plants to grow.

In Bogor Waqf Forest I, the eleven-member Berkah Bersama Group raised carp in a 2.5-meter x 1.5-meter pond. Agroforestry patterns that integrate forestry, agriculture, and fishery crops are known as agrosilvofisheries. In addition to agrosilvofishery, apiculture is another type of management that integrates forestry crop management, agriculture, and honey bee farming (Hairiah et al. 2003). The main product of this waqf forest management is carp, which is sold to consumers, residents, and visitors to the waqf forest. The productivity of honey from the apiculture pattern is very low; therefore, the results cannot be marketed to consumers. In addition to the Berkah Bersama Group, BAZNAS also assists women around the waqf forest who are members of the *Asri Berseri* with ten members. The group's activity is to make processed food or souvenirs served and sold to visitors to the waqf forest. Bogor Waqf Forest I provides facilities to support tourism activities such as coffee shops, huts, toilets, kitchens, and prayer rooms (Figure 2a).

The Bogor Waqf Forest II is located adjacent to Bogor Waqf Forests I and V. The management activities of Bogor Waqf Forest II were the same as those of Bogor Waqf Forest I, starting with land preparation, planting, maintenance, harvesting, marketing, and infrastructure development. The management patterns carried out in Bogor Waqf Forest II were apiculture, agrosilvofishery, and agrosilvopasture. Agrosilvopasture is a management system that combines crops (vegetables and ornamental plants), forestry plants (trees), and livestock (sheep). The trees planted were cloves (*Syzygium aromaticum*), *damar* (*Agathis dammara*), African wood (*Maesopsis eminii*), and *dombeya* (*Dombeya wallichii*). Horticultural species such as banana (*Musa paradisiaca*) and papaya (*Carica papaya*). Maintenance activities included fertilization, pruning, and replanting. The main products obtained from Bogor Waqf Forest II management activities are sheep and fish, which the Giat Bersama Group sold locally.

The *Giat Bersama* Group comprises ten members from the community around the Bogor Waqf Forest. In addition to raising sheep, the group has also started cultivating goldfish in a 1.5-meter x 1-meter pond. Bogor Waqf Forests I and II are suitable for agrosilvofisheries because they have abundant water sources. The Bogor Waqf Forest Foundation manages the water sources to be distributed to the community around the waqf forest. To date, 30 households have used water sources for their daily activities. Honey productivity is still very low; therefore, no product can be harvested or marketed. In addition to these products, Bogor II Waqf Forest also functions as an ecotourism site. Bogor Waqf Forest II facilities for visitors include huts, toilets, and prayer rooms (Figure 2b).

Bogor Waqf Forest III is adjacent to Bogor Waqf Forest IV. Management activities in this waqf forest begin with land preparation, planting, and maintenance. The species planted are the same as in Bogor Waqf Forest I and II, which are dominated by fruit species, such as mango (*Mangifera indica*), *durian* (*Durio zibethinus*), *rambutan* (*Nephelium lappaceum*), mangosteen (*Garcinia mangostana*), *longan* (*Dimocarpus longan*), and jackfruit (*Artocarpus heterophyllus*). There are also other types of trees, such as mahoni (*Swietenia macrophylla*), clove (*Syzygium aromaticum*), *akasia* (*Acacia* sp.), *damar* (*Agathis dammara*), and *petai* (*Parkia speciosa*). Maintenance activities included fertilization, replanting, and pruning. The management pattern in this waqf forest was apicultural. High rainfall has resulted in very low honey productivity and has not produced a product that can be harvested sustainably. Based on this experience, Bogor Waqf Forest III management carried out with the Citra Berdikari Group is prioritized for ecotourism.

There are seven members of the Citra Berdikari Group. Bogor Waqf Forest III facilities included a hut, toilet, and prayer room (Figure 2c).

Management activities in Bogor Waqf Forest IV included land preparation, planting, and maintenance, similar to those in Bogor Waqf Forests I, II, and III. Bogor Waqf Forest IV is managed using the agrisilviculture principle, which combines crops (ornamental plants) and multipurpose tree species, such as water rose (*Syzygium aqueum*), *nyamplung* (*Calophyllum inophyllum*), *rambutan* (*Nephelium lappaceum*), *mahoni* (*Swietenia macrophylla*), *durian* (*Durio zibethinus*), and cloves (*Syzygium aromaticum*). Trees were planted at 3 x 3 meter with ornamental plants. Land preparation includes land clearing, creation of planting holes, and terracing. Terracing is a soil and water conservation technique that is usually applied to sloping lands. The management of Bogor Waqf Forest IV is also intended for ecotourism activities such as camping ground areas (Figure 2d).

Bogor Waqf Forest V has not been organized like Bogor Waqf Forests I, II, and III; therefore, there are no land preparation activities until marketing. Infrastructure to support ecotourism activities has yet to be built on this land. Before becoming a waqf land, the Bogor Waqf Forest V was a garden that applied agrisilviculture principles by planting species such as cloves (*Syzygium aromaticum*), pine (*Pinus merkusii*), *sengon* (*Falcataria moluccana*), *mahoni* (*Swietenia macrophylla*), *rambutan* (*Nephelium lappaceum*), cardamom (*Amomum compactum*), and *aren* (*Arenga pinnata*) (Figure 2e). Bogor Waqf Forest has a wide range of activities, including agroforestry forest management and other activities, such as Islamic preaching activities for the community around the waqf forest, informal education for children called *Sekolah Rimbawan Kecil (Serincil)*, and humanitarian activities in the form of disaster management.

The Bogor Waqf Forest Foundation regularly organizes Islamic preaching activities to provide religious understanding and Quranic learning for the community around the waqf forest. The *Serincil* activity is a learning platform for the Cibunian Village community to recognize and preserve the environment. Disaster management activities collaborate with the Bogor Waqf Forest Foundation and BAZNAS in the BTB program. The BTB program formed a Disaster Response Village (KATANA) group. As a form of disaster mitigation in Cibunian Village, KATANA is empowered to carry out planting activities in the Bogor Waqf Forest.

CONCLUSION

Bogor Waqf Forest Foundation builds and manages waqf forests by collecting donations in the form of zakat, infaq, sadaqah, and waqf (ziswaf). In addition, the Foundation also collaborates with BAZNAS and the Indonesian Ministry of Religious Affairs to manage waqf productively by assisting to the *Berkah Bersama* Group, the *Giat Bersama* Group, the *Citra Berdikari* Group, and *Asri Berseri*, and the KATANA Group. Bogor Waqf Forest management practices apply complex agroforestry patterns, namely agrosilvofishery (an integration pattern between agriculture, forestry, and fisheries) in Bogor Waqf Forest I and II, agrosilvopasture (an integration pattern between agriculture, forestry, and livestock in Bogor Waqf Forest II, apiculture (an integration pattern between agriculture, forestry, and honey bee cultivation) in Bogor Waqf Forest I, II, and III, and agrisilviculture (an integration pattern between agriculture and forestry) in Bogor Waqf Forest IV and V.

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