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Management Strategies of a Productive Waqf-Based Forest in Bogor, Indonesia

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ABSTRACT

Waqf-based forest is developed on waqf land and is now being developed in Indonesia. It combines Islamic principles with environmental conservation, as being waqf assets, a forest is prohibited from being sold, given, or inherited. An effective management strategy is crucial to ensure waqf-based forest productivity and sustainability. Some research has already been conducted, but the specific dimension remains unexplored. This study aims to identify essential aspects and effective management strategies to escalate waqf-based forest benefits. Using a comprehensive approach, this study combines a literature study, in-depth interviews, and a study case in Bogor Waqf Forest, Bogor Regency, Indonesia. The findings were analyzed using the Analytic Hierarchy Process (AHP), followed by Focus Group Discussion (FGD) and further in-depth interviews as the validation process. There are six important considerations to optimize waqf-based forest management: legal, ecological, Islamic, economical, social, and aesthetic. The land's legal status as waqf assets is recognized as the most crucial aspect to avoid possible conflict and sustainability in the future. Then, the following considerations are improved ecological and Islamic activities aspects, economic strategies, and social and aesthetic consecutively. This research is expected to provide a deeper investigation of the future management strategies for waqf-based forests.

1. Introduction

Indonesia has one of the largest tropical rainforests in the world, capturing a significant diversity of flora and fauna (Greenpeace 2019). However, data from Globalforestwatch (2019) reveals that from 2001 to 2018, Indonesia experienced a loss of 25.6 million ha of forest cover, resulting in a 16% decrease and emitting 10.5 gigatons of CO_2. Disturbingly, Farand (2020) reports that forest clearance in Indonesia increased by 50% during the initial 20 weeks of 2020 amid the COVID-19 pandemic.

Deforestation refers to converting forests into non-forest land uses, impacting biodiversity and contributing to the greenhouse effect, particularly in tropical regions (Okia 2012). Efforts should focus on forest protection through activities like reforestation and conservation. This activities aims to plant and preserve forests for the benefit of future generations and ensure sustainable tree species and age distributions (Pawar and Rothkar 2015). The ultimate goal of

forest conservation is to safeguard forests, maintaining their productivity and sustainability. Productive forests are those forests capable of generating timber products and other non-timber goods and services. These services include various ecological benefits and educational opportunities (Crow et al. 2006). Moreover, it encompasses preserving the forest's inherent resources, essential for human beings and the natural environment.

The government and society have initiated efforts to conserve forests in Indonesia through legislation and initiatives; however, forest loss due to changing land use, resource exploitation for industrialization, and encroachment by local communities persist (Austin et al. 2019; Forbes and Broadhead 2011; Sukwika et al. 2018). Alternative approaches, including a religious approach, are required to safeguard Indonesia's forests and promote forest sustainability. With Indonesia hosting the most significant number of Muslim adherents globally, religious principles can guide environmental management strategies (Alghamdi 2014; Diamant 2019). One of the examples is through waqf (Islamic endowment). According to Muslim jurists, waqf is inherently perpetual and inalienable, meaning it cannot be sold, transferred, mortgaged, gifted, inherited, attached, or alienated (Jahangir et al. 2020). Also, the long-term sustainability of waqf is ensured by implementing religious laws to administer and enhance waqf productivity (Rochani et al. 2022).

Increasing environmental awareness among Muslims has led to the development of various conservation efforts, including the establishment of waqf-based forests, which combine forest conservation with waqf principles. Waqf-based forests can be briefly defined as forests established on waqf land. These forests may serve various functions and roles, but their primary land use remains as forests (Ali and Kassim 2020). Because waqf land cannot be sold, donated, or awarded, the presence of forests built on it ensures the forest's sustainability. Therefore, the ownership of the waqf-based forest has been transferred from private to Allah SWT and is being used for public benefit. By utilizing waqf land for forest conservation, the sustainability of the forest is ensured, as waqf regulations prohibit changes in land use indefinitely (Jannah et al. 2020).

As a component of waqf assets, waqf-based forests hold great potential in Indonesia. Productive waqf-based forests aim to provide sustainable benefits encompassing ecological, economic, and social aspects (Ali and Kassim 2020). Generally, productive waqf properties have the potential to alleviate poverty and contribute to the development of Islamic economics, improving livelihoods. However, previous research indicated that most of Indonesia's waqf land remained unproductive due to the lack of ability of the waqf manager (*nazhir*) to manage the assets effectively. A study in Indonesia found that 77% of waqf assets in 11 provinces continued to be unproductive (Kasdi 2014). Therefore, the waqf management strategy should be improved (Huda et al. 2017; Widiastuti and Wahyuningsih 2018).

Much research on waqf-based forests has explored their potential for forest conservation (Budiman 2011; Hasanah and Hakim 2017; Yaakob et al. 2017). A study by Setyorini et al. (2020) mentioned that waqf-based forests play an important role in sustainable development by ensuring that future generations inherit a high-quality environment. On the other hand, Ali and Kassim (2020) investigated the role of waqf-based forests in achieving Sustainable Development Goals (SDGs), namely SDG 1 (no poverty), SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), SDG 13 (climate action), and SDG 15 (live on land). Subsequently, Jannah et al. (2020) sought to legalize waqf-based forest land as waqf assets under Indonesian legislation. This previous research underscores the growing recognition of waqf-based forests as vital instruments for environmental conservation, sustainable development, and achieving global sustainability objectives.

However, there is a gap in research regarding a detailed discussion on management strategies for productive waqf-based forests, a forest built on waqf land to prevent further deforestation and optimize the forest benefits (ecology, economy, and social) as a productive waqf asset, particularly in Indonesia. While previous research focused on the Strengh, Weakness, Opportunity, and Threat (SWOT) aspect and some waqf-based forest *nazhir* strategies such as fundraising intensification, volunteer recruitment, encouraging the issuance of waqf-based forest fatwa, and obtaining permission as a cash waqf collector (Ali and Kassim 2021), the waqf-based forest development using the Benefit Opportunity Cost Risk (BOCR) method (Munandar et al. 2022), the brand equity analysis of waqf-based forest purchase intention (Firmannudin et al. 2024), also the potential criteria to determine a waqf-based forest location in Indonesia (Jannah et al. 2024), there is limited research addressing the specific activities and strategies necessary to enhance the productivity of waqf-based forests. Thus, this research aims to identify these aspects and management strategies that can be implemented to ensure waqf-based forests are ecologically beneficial and provide economic and social benefits.

This paper begins with an introduction that explains the background of the research related to the forest conditions in Indonesia, waqf as an approach to forest management in the form of waqf-based forests, and the need for management strategies to enhance the productivity of the waqf-based forest. The methodology outlines the research stages, including data collection, data analysis using AHP, and findings validation. The third section is the discussion, which provides a detailed analysis of each aspect of the strategy for waqf-based forest management. The paper concludes with a conclusion and recommendations.

2. Materials and Methods

2.1. Study Area

The study involved direct observations of the case study site, Bogor Waqf Forest in Cibunian Village, Pamijahan District, Bogor Regency, West Java, Indonesia (**Fig. 1**). It is located at 6° 42' 46.4" latitude and 106° 37" 58.4" longitude, the waqf-based forest placed near the Mount Halimun-Salak National Park (MHSNP). It is between 0–1000 m altitude with various slopes (8% to more than 40%). The Cibunian village soil was largely alluvial and andosol. The major land used is rice crops; most local people live daily as sharecroppers (Rahayu 2016).

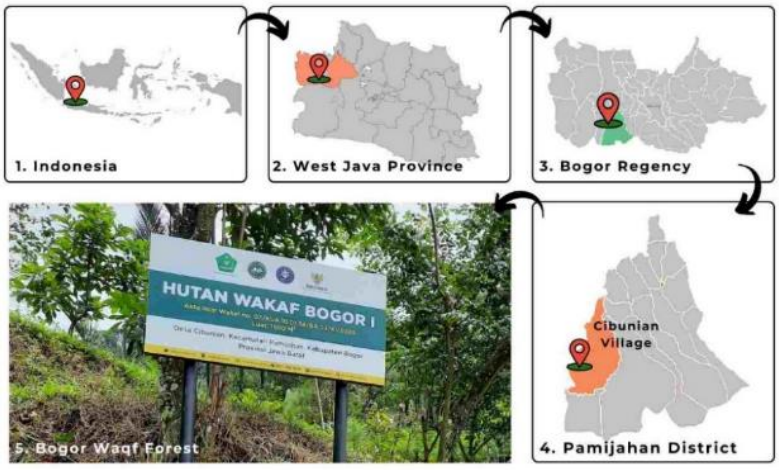

Fig. 1. Bogor Waqf Forest, located in Cibunian Village, Pamijahan District, Bogor Regency, Indonesia, as the study area.

The Bogor Waqf Forest was chosen as it represented the development of waqf-based forests in Indonesia, considering factors like accessible information, proximity to Jakarta, and its leading administration and legalization. The Aceh Waqf Forest was omitted from consideration due to limited data and restricted access constraints, with its management primarily centered on ecological aspects. Meanwhile, the research objectives aim to delineate management strategies for waqf-based forests that prioritize ecology, economic, and social dimensions according to the sustainable forest management (SFM) concept (FAO 2020).

2.2. Data Collecting Method

This research was conducted from 2020 to 2023, utilizing various data collection and analysis methods. Literature review, in-depth interviews, and direct observation at the case study location were employed to gather data. This study's initial data collection method was a four-stage literature review. These stages encompass selecting the review topic, searching for relevant and suitable articles, analyzing and synthesizing the literature, and composing a well-organized review (Ramdhani et al. 2014). **Table 1** briefly lists the literature sources used to formulate the Analytic Hierarchy Process (AHP) model.

Table 1. Literature sources used to formulate the Analytic Hierarchy Process (AHP) model

Aspect	Strategies	Source of Literature
Legal	- Ensuring the forest cover percentage - Ensuring the waqf land legal status	(Jahangir et al. 2020; Jannah et al. 2020; Pasamai et al. 2018; Ardiansyah 2019; Republic of Indonesia 1999, 2004; Rosyid 2016; Syafiq 2016)
Ecology	- Selecting the type of plants - Prioritizing native plants - Determining zonation	(Brockerhoff et al. 2017; Chazdon et al. 2016; Indrajaya and Astana 2017; JICA 2014; Olena et al. 2020; Whitehead et al. 2014)
Economy	- Practicing agroforestry - Designing an ecotourism - Prospering a partnership project	(Abdillah and Prayogo 2020; Ali et al. 2021; BPS 2019; Hartoyo et al. 2016; Nair et al. 2022; Rosmaladewi et al. 2017)
Social	- Enhancing local community engagement - Conserving local wisdom - Conducting a conservation-based education	(Abdillah and Prayogo 2020; Ali and Kassim 2021; Ardoin et al. 2020; BPS 2015; Purwowibowo et al. 2020; Sukwika et al. 2018)
Islamic	- Providing prayer facilities and activities - Providing Islamic signage	(BAZNAS 2017; Jannah et al. 2019)
Aesthetic	- Improving and maintaining the landscape quality	(Mäntymaa et al. 2021; Thompson et al. 2010; Wartmann et al. 2021)

The outcome of the literature review is the AHP Framework (**Fig. 2**).

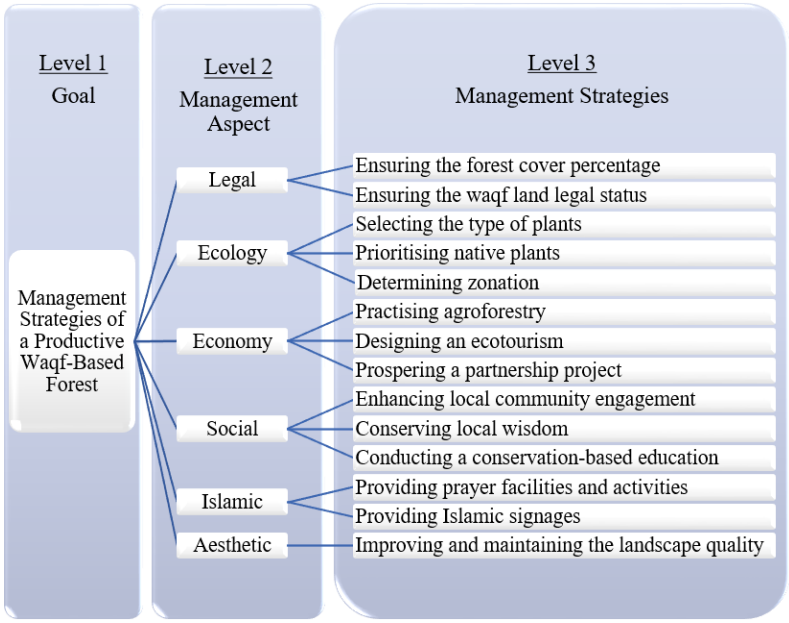

Fig. 2. Analytic Hierarchy Process (AHP) model of management strategies of a productive waqf-based forest.

The subsequent step involves conducting in-depth interviews with seven experts to assess the priority of management strategies within the AHP Framework. These experts, categorized as practitioners, regulators, and academics, respond to AHP questionnaires based on their expertise in waqf, forestry, and related regulations (**Table 2**). They rate the criteria using pairwise comparison ratings, assigning numerical values between 1 and 9 to quantify the importance of each criterion. Differing opinions among the experts are likely due to their specialized areas (Saaty and Vargas 2006).

Table 2. In-depth interviews of key informants

Code	Expertise	Institution
ACH	Practitioner	Bogor Waqf Forest Foundation and Department of Silviculture, Faculty of Forestry, IPB University
KMA	Practitioner	Bogor Waqf Forest Foundation
MFN	Regulator	Ministry of Religious Affairs
HT	Regulator	Indonesian Waqf Board
ISB	Academics	National Zakat Board (BAZNAS) and Department of Islamic Economics IPB University
NH	Academics	Department of Islamic Economics, University of Indonesia
HSA	Academics	Department of Landscape Architecture, IPB University

2.3. Data Analysis Method

The AHP method was used to develop strategies for productive waqf-based forests; seven experts were interviewed to get expert priority judgment. The Super Decisions 2.10 software was used to process pairwise comparison data in this study due to its user-friendly nature and relevance to the decision-making process. Each expert entered their pairwise comparison values separately, and the software was used to calculate the differences between the values and assign them accordingly. After inputting all values, a consistency ratio was checked to ensure the judgments

were consistent. If the consistency ratio was below 0.1, the decisions were considered consistent; otherwise, they required correction. The software provided the consistency ratio directly in the table of pairwise comparison data (**Fig. 3**).

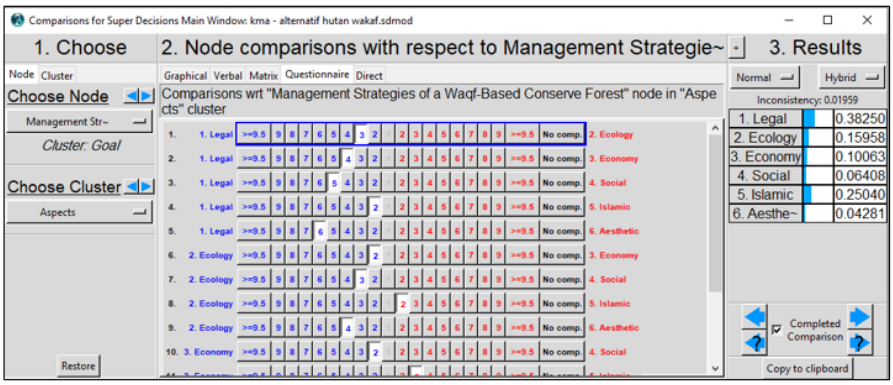

Fig. 3. The pairwise comparison data input in the Super Decision software.

The analysis and synthesis followed the AHP hierarchy quantification through pairwise comparisons. The priority values of each criterion and alternative were found in the Super Decision software, indicating their importance—geometric mean combined individual experts' priority weights to achieve a scientific consensus. The overall assessment was obtained as the geometric mean, representing the final result. The GM values were calculated using Microsoft Excel software, as they cannot be directly obtained from the Super Decision Software (Marimin 2004; Saaty and Vargas 2012; Rusydiana and Devi 2018). The raw data from the questionnaire is inputted and inversed for rows with fewer colors to calculate the mean value, ensuring red numbers are inverted where red is less than black. The resulting values are entered into the geometric mean formula, forming a new column, and inputted into the Super Decisions software to obtain an average opinion from all respondents.

2.4. Findings Validation Method

The research results underwent validation through a Focus Group Discussion (FGD) conducted in March 2022 and an in-depth interview conducted in May and October 2023. **Table 3** presents the experts involved in the validation process and the respective methods employed.

Table 3. Expert list for findings validation

Code	Expertise	Institution	Method
KMA	Academics	IPB University and Bogor Waqf Forest Foundation	FGD
EDH	Local people/ practitioners	Zakat Community Development, BAZNAS Indonesia	FGD
SHR	Local people/*nazhir*	Bogor Waqf Forest Foundation	FGD
FMM	Academics, Islamic environmentalists	National University (UNAS)	In-depth interview
SYN	Regulator	Association of Indonesia Forest Concession Holders (APHI) and Indonesian Ulema Council	In-depth interview
AFA	Local people/*nazhir*	Aceh Waqf Forest	In-depth interview
EMN	Local people/ *mauquf'alaih*	Cibunian Village/Bogor Waqf Forest	In-depth interview

3. Results and Discussion

3.1. Analytic Hierarchy Process (AHP) Results

In the context of productive waqf-based forest management, six aspects must be considered: legal, ecological, economic, social, Islamic, and aesthetic. Each element comprises several alternative strategies. The expert evaluations determine the prioritization of aspects and strategies for managing a productive waqf-based forest. Based on the Geometric Mean calculation for overall priority (**Table 4**), the legal aspect has the highest priority (0.03), followed by the ecological aspect (0.23) and the Islamic aspect (0.15). The economic and social aspects hold equal priority values (0.13), and the aesthetic aspect is of lesser priority (0.07) but should not be overlooked. However, it is found that the consistency ratio from all of the data is below 0.1 (CR < 0.1), so it can be concluded that the expert's judgment is consistent.

Experts stress that a waqf asset should not remain idle for an extended period. Once the land is converted into a productive waqf-based forest, immediate and effective management is crucial to maximizing benefits for beneficiaries. One expert, MFN, highlights that a sustainable management strategy is vital as waqf-based forests are a fundamental part of the Islamic ummah's "environmental jihad", tied to prosperity and justice for future generations.

> *"Waqf-based forests are also part of the environmental jihad of Muslims because it is closely related to aspects of the benefit of human life that are neglected. Look at this waqf, especially the waqf related to the environment and the forest; this is a gift for the future. We hope that with the inclusion of waqf elements into forest conservation, we will see forests not only as the lungs of the world but also as forests with prosperity and justice. The state protects, so there is no need to hesitate in developing waqf-based forests*."

In the next section, the management strategy for a productive waqf-based forest, quantified by experts through the AHP (Analytical Hierarchy Process) method, will be elucidated.

Table 4. Overall priority based on the geometric mean value

Aspects	Importance	Management strategies	Importance per aspects
Legal	0.27	Ensuring the forest cover percentage	0.50
		Ensuring the waqf land legal status	0.50
Ecology	0.23	Selecting the type of plants	0.50
		Prioritizing native plants	0.25
		Determining zonation	0.25
Economy	0.13	Practicing agroforestry	0.40
		Designing an ecotourism	0.20
		Prospering a partnership project	0.40
Social	0.13	Enhancing local community engagement	0.40
		Conserving local wisdom	0.20
		Conducting a conservation-based education	0.40
Islamic	0.15	Providing prayer facilities and activities	0.67
		Providing Islamic signages	0.33
Aesthetic	0.07	Improving and maintaining the landscape quality	1.00

3.1.1. Legal aspects

The management of legal aspects is crucial in creating a productive waqf-based forest. *Nazhirs* are bound to manage the waqf assets according to the waqf's intentions, and changing the

land's function is prohibited. Two primary strategies are emphasized: ensuring the forest cover percentage and securing the waqf land's legal status.

Ensuring the legal status of the waqf land is crucial for long-term sustainability. Proper registration and acknowledgment by the government strengthen the forest's status as a waqf asset. The well waqf made by Uthman ibn 'Affan in Madinah is an example of a sustainable philanthropic waqf maintained and managed by the Ministry of Endowments in Saudi Arabia for generations (Rohmaningtyas and Herianingrum 2017).

All experts stress the importance of promptly addressing the legal status of waqf land. However, MFN addressed that challenges arise due to inadequate documentation and the state's lack of recognition of waqf assets, hindering the completion of Waqf Land Certificates.

> *"A nazhir needs to be competent under the managed waqf assets. This competence must also be accompanied by good waqf literacy. One of the things that a nazhir must understand is how to take care of the legality of a waqf asset until it is finished. Many ownership transfers or transfers of waqf land functions occur in Indonesia, one of which is due to the nazhir's inability to take care of its legality, so the related documents are incomplete, and the waqf assets are not officially registered as waqf."*

Nonetheless, the *nazhir* of Bogor Waqf Forest diligently works towards securing the legal status of the forest land, and by the end of 2021, all Waqf Pledge Deeds were completed (**Fig. 4**).

Fig. 4. Waqf pledge deed signing.

Additionally, the forest cover percentage is vital, and it should be at least 50% woody plants and 500 plants/ha in the first year, following the Forestry Ministry Decision Number 49 of 1997 (Ardiansyah 2019). Experts agree that fulfilling these requirements is essential, as it aligns with the waqif's mandate to use the assets as a forest forever. *Nazhirs* must take prompt action, including planting activities, to meet the forest criteria if the waqf-based forest falls short. Overall, effective management of legal aspects is crucial for creating a productive and sustainable waqf-based forest, ensuring compliance with regulations, and safeguarding the waqf land's status for the benefit of future generations.

3.1.2. Ecological aspects

The ecological aspects are crucial for maintaining a productive waqf-based forest, contributing to its sustainability and productivity. The strategies encompass selecting the appropriate plant species, prioritizing native plants, and establishing zonation. Suitable plant

species are essential for economic and social benefits, watershed protection, and carbon sequestration (Indrajaya and Astana 2017). A diverse range of plants fosters symbiotic mutualism, supporting each other's needs. In the Bogor Waqf Forest, the *nazhir* and the community plant various plants with ecological benefits and economic advantages (**Fig. 5**). HT from the Indonesian Waqf Board stated as follows:

> *"The forest waqf is essentially a land waqf, but its intended use is specified as a forest. Because it is specified as a forest, the management aspects must involve aspects related to forest management. For example, how do you plant plants on the forest waqf land? It can start with selecting the types of plants, the planting design (planting plan), and managing the plant to be fruitful and sustainable.*"

Fig. 5. Planting activity by the *nazhir* and the local community in the Bogor Waqf Forest.

Prioritizing native plants is vital for sustainability, as they grow organically and are well-suited to the local soil and climate conditions. They require low maintenance, provide habitat for local wildlife, and offer aesthetic value (Berthon et al. 2021). *Nazhirs* worked closely with the community, involving them in plant selection to ensure optimal growth. However, productivity should also be considered when selecting local plants for waqf-based forests. Apart from that, if there are endemic species, they must be prioritized because endemic plants are generally more dangerous and potentially become extinct (Coelho et al. 2020). Thus, waqf-based forests will also have an ecological function as an in-situ conservation area.

Zonation is advantageous in managing diverse activities and defining the allowed uses in each zone. Zoning can be determined by combining biological and social data, resulting in optimal areas for each use. It will make it easier for decision-makers to develop each area optimally, both for community needs and as a conservation area (Whitehead et al. 2014). The Bogor Waqf Forest currently has three zones, which are differentiated based on location and functions. Zone 1 and Zone 3 focus on ecotourism and education, such as sightseeing, picnics, camping, trekking, stingless-bee educating, children's conservation, and Qur'an classes. On the other hand, Zone 2 emphasizes agroforestry practices and forest plant maintenance. By addressing the ecological aspects through these strategies, the waqf-based forest can be optimized for sustainable and productive management, benefiting both the environment and the local community.

3.1.3. Islamic aspects

Islamic aspects are distinctive in managing waqf-based forests, even though they hold universal significance. ACH and KMA, the founders of the Bogor Waqf Forest, emphasize that Islamic principles should underpin every management strategy for these forests. ACH stated as follows:

> *"Substantially, waqf-based forests, including the surrounding environment, are objects of da'wah from the nazhir. However, again, the community is the key. It must be guided and nurtured. Therefore, the nazhir must seek Islamic facilities (such as prayer rooms and other infrastructure facilities), feasible programs, and those in charge of implementing the program*."

Establishing prayer facilities and activities emerges as a prominent strategy. BAZNAS mentioned that these facilities signify the success of village-based zakat programs (BAZNAS 2017). Experts underscore the significance of promptly procuring prayer facilities, as worship must be facilitated in any situation. The lack of such amenities contradicts the forest's purpose as an Islamic symbol. The importance of incorporating educational activities and enhancing Islamic awareness is emphasized. The Bogor Waqf Forest, constrained by limited resources, provides space for praying and essential amenities like prayer rugs and Qur'ans and conducts weekly Qur'an teaching classes (**Fig. 6**).

Fig. 6. Local children attended a Weekly Qur'an class in the Bogor Waqf Forest 3rd Zone.

Islamic signage is crucial for fostering Islamic values within the location. It serves as a reminder of ethical conduct in line with Islamic principles, differentiating a regular public place from an Islamic one. These signages in waqf-based forests aim to maintain an environment free from un-Islamic behaviors. The Bogor Waqf Forest uses simple signages to remind visitors and the community of behavioral guidelines, such as modest dress, prohibition of smoking and gambling, and encouragement of productive activities.

EDH, responsible for daily activities in the Bogor Waqf Forest, highlights the positive influence of such signages on visitors and the community. These signs enhance awareness of the forest's Islamic management, fostering responsible behavior in line with Islamic teachings.

3.1.4. Economic aspects

From an economic aspect, the productive waqf-based forest management strategy aims to ensure that waqf-based forests can fulfill the local people's daily needs. They can generate income and improve their living standard. By providing economic benefits in the form of income to local communities, it is hoped that the community will feel ownership and participate in preserving waqf-based forests. The economic aspect is a pivotal component, equal in importance to the social aspect, in the strategic management of waqf-based forests. These forests play a vital role in the lives of people residing in or near them, with up to one-third of Indonesia's impoverished population living in or around forested areas. Thus, the management of productive waqf-based forests should be geared towards improving the well-being of these communities, as this aligns with the concept of *mauquf'alaihi*. KMA from Bogor Waqf Forest Foundation stated as follows:

> *"It can be synergized between ecological, economic, and social benefits in one activity, so there is no need to contradict it. At a minimum, there must be ecological benefits. On the other hand, economic benefits should not reduce ecological benefits. For example, yesterday, when I met with an institution, there were suggestions on making waqf more productive, especially economically (in line with the ecological aspect), because the challenge for waqf managers, in general, is how to make this waqf productive."*

Agroforestry emerges as the most critical economic strategy, emphasizing the importance of partnership projects. This practice involves the symbiotic interaction of agriculture and trees, a traditional approach in Indonesian society for generations. Agroforestry offers a range of benefits, including increased biodiversity, improved soil conditions, a broader range of forest products, sustainability, and increased income for farmers (Dollinger and Jose 2018; Hartoyo et al. 2016; Roslinda et al. 2023). Experts unanimously agree on the necessity of implementing agroforestry practices in waqf-based forests. These practices enable communities to utilize forest land without disrupting the ecosystem, enhancing their livelihoods and contributing to forest conservation. In the Bogor Waqf Forest, local people tried agrosilvofishery (**Fig. 7**).

Fig. 7. Agrosilvofisheries practice in Bogor Waqf Forest 1st Zone, by Berkah Bersama Community Group.

Prospering partnership projects holds the same weight as practicing agroforestry. It aligns with Rosmaladewi et al. (2017), who found that multistakeholder forest management can help prevent resource overuse and reduce the risk of natural disasters. A collaboration with various

stakeholders such as BAZNAS Indonesia, The Ministry of Religious Affairs, and some other organizations is currently being carried out by Bogor Waqf Forest. This partnership is essential for waqf-based forest development and sustainability since it provides funding for operational and capital expenses, the construction of infrastructure and facilities, and supports community and social activities within the forest. Furthermore, it also contributes to local enterprises. It promotes Islamic and environmental conservation training and education to elevate the benefits of waqf-based forests for local communities, resulting in the long-term sustainability of the waqf-based forest.

Ecotourism means enjoying the beauty of nature, and it can be done in national parks and forests. It can also involve exploring natural resources and attractions (Abdillah and Prayogo 2020). Most experts give a lower priority to the strategy of designing waqf-based forests for ecotourism. However, some experts mentioned that ecotourism has significant potential. Ecotourism is very beneficial in promoting sustainability and generating income for the forest and the surrounding community. It should become a long-term goal for waqf-based forest management because a *nazhir* needs to prepare adequate facilities and infrastructure to establish ecotourism destinations. Ecotourism has begun to gain attention in the Bogor Waqf Forest, with developed facilities such as road access, resting pavilions, and toilets. Local community groups, such as tour guides or meal providers, are being trained to serve visitors.

The economic aspect is essential in the management strategy of waqf-based forests. Practices such as agroforestry, ecotourism, and partnership highly contribute to the social, ecology, and Islamic dimension. The success of this economic strategy cannot be separated from the collaboration with various stakeholders and community involvement to ensure long-term prosperity and waqf-based forest sustainability.

3.1.5. Social aspects

The social aspect is pivotal in strategically managing productive waqf-based forests, closely intertwined with the economic dimension. ISB from the National Zakat Board (BAZNAS) stated as follows:

> *When talking about social empowerment, the aspect that must be considered is how the program design must be able to build local cadres accompanied by assistance. Then how can we take advantage of local resources? How do we strengthen the community to be community-based and use adequate technology? Regional institutions are fundamental to sustainability*.

Involving local communities is a vital social strategy. Communities residing near the forest must experience tangible benefits from its conservation to motivate active protection (Roslinda et al. 2021). Successful conservation often involves local communities and landscape management (Sukwika et al. 2018; Gege et al. 2023). Experts stress enhancing local community engagement in productive waqf-based forests if it aligns with Islamic and conservation principles. In the Bogor Waqf Forest, local community involvement has spurred rapid development through forest farmer groups in each zone (**Fig. 8**).

Preserving local wisdom, although ranked lower, remains essential. Indigenous knowledge has proven valuable in conservation efforts, especially in enhancing forest biodiversity (BPS 2015). Experts emphasize preserving local wisdom, provided it adheres to Islamic and conservation principles. This indigenous knowledge fosters harmonious coexistence with the

environment. In the Bogor Waqf Forest, local communities are encouraged to engage in ecological and economic activities per their customs.

Fig. 8. Local community groups in the Bogor Waqf Forest.

Conservation-oriented education, especially for younger generations, is highly significant. Effective environmental education instills pro-environmental behavior, moral values, understanding, and skills for positive ecological action (Ardoin et al. 2020). Experts suggest establishing educational institutions to prepare the younger generation as future *nazhirs*. Educational programs for children on forest conservation empower future generations with knowledge and capacity for conservation practices.

The Bogor Waqf Forest Foundation collaborates with IPB University students to organize weekly "Little Forester School (*Sekolah Rimbawan Kecil*)" sessions. These programs educate local children on conservation principles and applications, nurturing their enthusiasm for environmental conservation. In summary, the social aspect is pivotal in waqf-based forest management, encompassing local community engagement, preservation of local wisdom, and conservation-oriented education. Collaborative efforts and educational initiatives contribute to these unique forest assets' sustainable conservation and prosperity.

3.1.6. Aesthetic aspects

Although aesthetics is rated the lowest priority in managing productive waqf-based forests, it holds significance. Landscape quality has been linked to people's quality of life and their preferences for physical activities. For instance, it is found that landscape quality influences individuals' needs, desires, and experiences (Thompson et al. 2010; Wartmann et al. 2021). Also, a good landscape quality can boost activity levels, benefiting site managers financially (Mäntymaa et al. 2021).

Maintaining the visual quality of the waqf-based forest landscape is a crucial objective in its management. HSA, an expert, stressed that this is crucial as it affects the perceptions, emotions, and behavior of local communities and forest visitors. A well-managed and visually appealing forest landscape is more likely to be preserved than a neglected one. The *nazhir* and the local community plant forestry species in the Bogor Waqf Forest and incorporate aesthetically pleasing plants (**Fig. 9**). Maintaining cleanliness in the area is also a shared responsibility. HSA from the Department of Landscape Architecture, IPB University, stated as follows:

"Yes, the aesthetic factor is essential, even if our site is a forest, because it (aesthetics) can affect perceptions, feelings, and the behavior of people and visitors. If the forest is beautiful, neat, organized, good, of course, following how it should be, the desire to maintain it will be higher."

Fig. 9. Bogor Waqf Forest 1st zone welcome area.

3.2. Discussion

An extensive approach is needed to develop waqf-based forests, with the legal, ecological, Islamic, economic, social, and aesthetic dimensions to consider. It is important to ensure that the land of the waqf-based forest is registered as a waqf asset according to the current law as a legal standing, to give waqf-based forest legal certainty, maintain its ownership rights, and support sustainable utility.

Effective ecological management involves thorough plant selection and ensuring the presence of other beneficial and valuable species. Prioritizing the local and existing plants and applying the zonation system are crucial steps to preserve the ecosystem balance and diversity. Islamic principles obligate everyone to be grateful and conserve the Earth as a blessing. The practice of waqf-based forests without Islamic guidance and rules poses a risk of loss of Islamic identity that might bring up public dissatisfaction and violation of religious principles.

Deep knowledge about agroforestry is crucial for sustainable land utilization and beneficial for local economic growth. Developing ecotourism destinations in waqf-based forests can boost sources of income and opportunities for training and education, and collaboration with stakeholders can increase the economic potential for community development. Social aspects focus on a community-based approach, where active public participation is needed in decision-making and problem-solving in various programs. Without involvement, the public might lose interest in waqf-based forest management, negatively impacting forest conservation and sustainability.

Preserving local wisdom is crucial as long as it aligns with Islamic and conservation principles. Islamic and conservation-based education gives the community understanding and support for sustainability, ensuring future generations can continuously manage waqf-based forests. Lastly, from an aesthetic perspective, maintaining landscape quality through restoration that considers the beauty of nature and local culture could give additional value to the community and the visitors of the waqf-based forest. The absence of these features might degrade locals' concern about the environment and threaten the sustainability of the environment. Thus, a

comprehensive and integrative approach should be considered to preserve waqf-based forests' sustainability.

4. Conclusions

There are six important considerations to optimize waqf-based forest management: legal, ecological, Islamic, economic, social, and aesthetic. The land's legal status as waqf assets is recognized as the most crucial management aspect to avoid possible conflict and sustainability in the future. Effective ecological management involves thorough plant selection and ensuring the presence of other beneficial and valuable species. Islamic and conservation-based education gives the community understanding and support for sustainability, ensuring future generations can continuously manage waqf-based forests. The economic management aspect is essential in the management strategy of waqf-based forests. Practices such as agroforestry, ecotourism, and partnership highly contribute to the social, ecology, and Islamic dimension. Involving local communities is also a vital social strategy. Communities residing near the forest must experience tangible benefits from its conservation to motivate active protection. Lastly, from an aesthetic management perspective, maintaining landscape quality through restoration that considers the beauty of nature and local culture could give additional value to the community and the visitors of the waqf-based forest. Future research should develop specialized management strategies for distinct types of waqf-based forests, such as those found in karst and mangrove ecosystems, to ensure their sustainable and effective management.

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