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Economic Valuation of Bifemnasi Sonmahole Forest Area (Case: Taekas and Femnasi Village in North Central Timor Regency)

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ABSTRAK

Kawasan Hutan Bifemnasi Sonmahole merupakan kawasan hutan yang meliputi tiga kabupaten di perbatasan Indonesia dan Timor Leste. Kawasan hutan ini memberikan manfaat terutama di Desa Taekas dan Femnasi Kabupaten TTU, dimana sumber air dari kawasan hutan ini menyuplai kebutuhan air Kota Kefamenanu sejak tahun 1970 sampai dengan tahun 2000, namun saat ini hanya memenuhi kebutuhan warga Desa Taekas dan Femnasi. Penelitian ini bertujuan untuk menganalisis valuasi ekonomi kawasan hutan Bifemnasi-Sonmahole di Desa Taekas dan Femnasi Kabupaten Timor Tengah Utara. Penelitian ini menggunakan metode survei. Data diperoleh dengan cara observasi, wawancara, dan studi dokumen. Sampel ditentukan secara bertahap yaitu cluster dan purposive sampling, dengan jumlah sampel sebanyak 60 orang yang merepresentasikan nilai guna langsung, nilai guna tidak langsung, dan nilai non guna. Analisis data menggunakan metode harga pasar, biaya perjalanan, biaya pencegahan, manfaat transfer. Hasil penelitian menunjukkan bahwa nilai manfaat kawasan hutan Bifemnasi-Sonmahole di Desa Taekas dan Femnasi Kabupaten Timor Tengah Utara sebesar Rp 3.347.524.400,- yang diperoleh dari Nilai Manfaat Langsung sebesar Rp 236.210.000,- (7,06%); Nilai Manfaat Tidak Langsung sebesar Rp 2.296.438.400,- (68,60%) dan Nilai Non Manfaat sebesar Rp 814.876.000,- (24,34%).

Kata kunci: Kawasan Hutan Bifemnasi Sonmahole, Valuasi Ekonomi, Kabupaten Timor Tengah Utara, Desa Taekas dan Femnasi

ABSTRACT

The Bifemnasi-Sonmahole Forest Area is a forest area covering three districts on the border of Indonesia and Timor Leste. This forest area provides benefits, especially in Taekas and Femnasi Villages, TTU Regency, where water sources from this forest area supplied the water needs of Kefamenanu City from 1970 to 2000, but currently only fulfill the needs of the residents of Taekas and Femnasi Villages. This research aims to analyze the economic valuation of the Bifemnasi-Sonmahole forest area in Taekas and Femnasi Villages, North Central Timor Regency. The research used a survey method. Data was obtained by observation, interviews, and documents study. The sample was determined in stages, namely cluster and purposive sampling, with a total sample of 60 people to represent direct use value, indirect use value and non-use value. Data analysis used market price method, travel costs, preventive cost, transfer benefits. The results showed that the benefit value of the Bifemnasi-Sonmahole forest area in Taekas and Femnasi Villages, North Central Timor Regency is IDR 3,347,524,400, - obtained from a Direct Use Value of IDR 236,210,000,- (7.06%); Indirect Use Value is IDR 2,296,438,400 (68.60%) and Non Use Value is IDR 814,876,000 (24.34%).

Keywords: The Bifemnasi Sonmahole Forest Area, Economic Valuation, North Central Timor Regency, Taekas and Femnasi Villages

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1. INTRODUCTION

The increasing of population and development as well as increasing living needs cause increasing physical pressure on forest areas. Sarbi (2018) stated that the increase in population, followed by the rate of increase in consumption, exploitation of various natural resources including forests sustainable to escalate; making it increasingly difficult to stem the destruction of forests and the environment. Economic development has triggered the conversion of forest land into agricultural land or other land uses as the most common alternative source of income acquired by communities around forests is through extracting

resources from within forest areas (Scrieciu, 2007; Prasetyo et al., 2009; Lindström et al., 2012).

These socio-economic conditions have led to a reduction in forest area and forest degradation which is then exacerbated by forest encroachment, forest fires and other destructive (destruction) activities (Dwipayanti, 2009). Deforestation and forest degradation generated by land ownership conflicts, population growth, lack of economic opportunities, illegal logging, infrastructure expansion, lack of law enforcement, and ineffective management in the forestry sector (Kim et al., 2016). Sulieman (2018) stated that the main factors causing forest degradation and fragmentation were mechanical expansion of rain-fed agricultural land, felling of trees, poor grazing activities, and infrastructure development.

Cutting down trees had a detrimental impact vastly on the surrounding community, even the global community. Forest destruction caused economic damage which is relatedly ecological damage that was sometimes incalculable, yet (Mosahab et al., 2011). Economic valuation of forest areas is needed so that the assessment is more comprehensive, including use value (economic function) and non-use value (ecological and social function).

The use value in forest areas is generally categorized into wood and non-timber, while the non-use value is in the form of tourist locations and cultural development and maintaining biodiversity. Forest areas also provide water for the surrounding environment. Suparmoko (2009) stated that water is an important forest product because one of the functions of forests is to hold rainwater, which is then released slowly through springs and rivers. Putri et al., (2013) also stated that water availability is closely related to the existence of forests in the area, so there needs to be a balance in forest land management to maintain water availability. Forests provide a source of raw water that is utilized by the community, for various purposes such as household needs, irrigation for rice farming and Micro Hydro Power Plants (PLTMH) so that they have economic value.

The Bifemnasi-Sonmahole Forest Area is a forest area located among North Central Timor Regency, Belu Regency and Malaka Regency. This forest area provides ecological, economic and social benefits for the environment and surrounding communities. The Bifemnasi-Sonmahole Forest Area in Taekas Village and Femnasi Village is unique because it has excess water and has been a water provider for Kefamenanu City, North Central Timor Regency for 30 years (1970-2000); However, since 2001 the benefits as a water provider have continued to decline, and in 2020 the water was only able to meet the needs of the people in Taekas and Femnasi Villages. Yuwono et al., (2011) stated that the hydrological conditions were worrying, characterized by decreasing water discharge. The decreasing in water discharge is because forest areas which are water catchment areas experience land degradation due to changes in forest land use to dry land agricultural areas. The change is due to the value of forests in producing environmental services in the form of water and their water management is not yet considered importantly by the community. After knowing the economic value of water from forests, people whose use water are expected to carry out forest rehabilitation.

Pratama et al., (2018) stated that water availability is closely related to the existence of forests in an area so that forest management must be balanced in order to maintain water availability and the economic value of water. Measuring the economic value of water by identifying water uses, calculating average water consumption, and the price of water for each use.

The Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, apart from providing benefits in the form of providing water for household and agricultural needs; It also provides benefits in supporting living systems such as the availability of traditional sites so that traditional rituals develop in forest areas. Forest areas are also used as natural tourism locations and provide biodiversity. The better type of land cover or forest vegetation, it can be assumed that the area has high biodiversity value. Therefore, Ulya et al., (2014) stated that disruption of forest capacity will reduce the quality of human life.

Previous studies assessed natural resources from ecological economic benefits and few analyzed socio-cultural benefits using a total economic value approach Loomis et al., (2019); Nitanan et al., (2020). Taye et al., (2021) conducted an integrated assessment of several natural resource environmental services; and Martino & Kenter, (2023) conducted an economic assessment of natural resources using deliberative preferences to complement the conventional economic valuation approach. The novelty of the research in the Bifemnasi-Sonmahole Forest Area, in Taekas and Bifemnasi Villages, North Central Timor Regency, is the measurement of the total economic value, especially the forest conservation assessment approach using the value of sacrifice in the implementation of traditional rituals at traditional sites in the research location. Therefore, the study aims to analyze the total economic value (TEV) of the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, North Central Timor Regency.

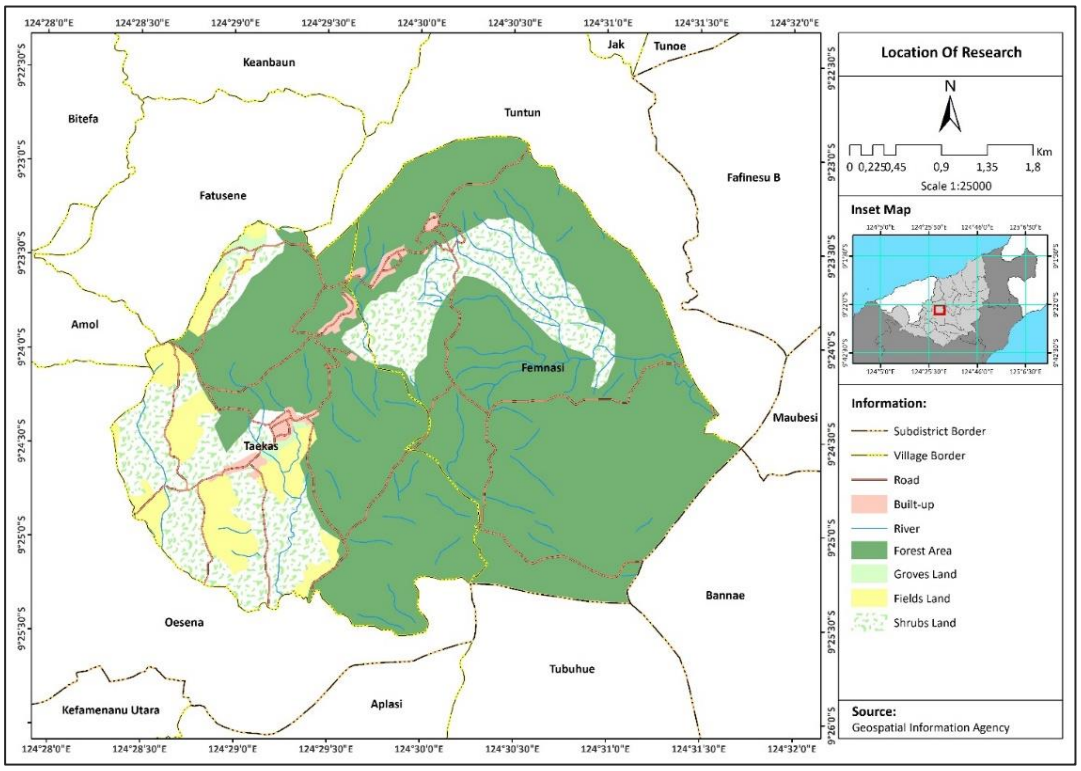

Figure 1. Location of Research

2. METHODS

2.1. Location of Research

The research was accomplished from May to December 2022 in the Bifemnasi-Sonmahole Forest Area, in Taekas Village and Femnasi Village separately, East Miomafo District, North Central Timor Regency. The research location has a water source that meets the needs of the residents of Kefamenanu City (the capital of North Central Timor Regency) several decades before 2000, but currently the water source is only able to meet the needs of the residents of Taekas and Femnasi Villages due to a biased understanding of the value of natural resources; so a study is needed at the location to change the perspective of natural resource valuation as a whole. The research location is close to Kefamenanu City as the Center for National Strategic Activities (Presidential Regulation Number 179 of 2014); as shown in Figure 1.

2.2. Data

The data used in this research are primary data and secondary data. Primary data was obtained from the community in Taekas and Femnasi Villages, with a sample determined by purposive sampling of 60 respondents with consideration to represent direct use value, indirect use value and non-use value. Secondary data was obtained through literature studies and related agencies.

2.3. Data Collection Methods

The data collection method used in this research includes three techniques were interviews, observation, document study, respectively. Interviews applied to obtain as much as possible for data and information through questions and answers from the informants; Direct observation of biodiversity and water use; Study of documents and literatures from the Technical Management Unit of the Forest Management Unit of the North Central Timor Regency, Geospatial Information Agency (BIG), and related agencies.

2.4. Data Analysis

Darmawan, (2015) stated that economic valuation is one method of analyzing environmental services. The economic valuation of the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages is briefly shown in Figure 2, while the formula is as follows:

$$TEV = UV + NUV \quad (1)$$
$$UV = DUV + IUV \quad (2)$$
$$NUV = OV + XV + BV \quad (3)$$

Information:
TEV : Total Economic Value
UV : Use Value
NUV : Non-Use Value
DUV : Direct Use Value includes guava, firewood, and forest honey
IUV : Indirect Use Value includes water use for consumption and business
OV : Option Value includes biodiversity and carbon sinks
XV : Existence Value include: tourism
BV : Bequest Value includes cultural heritage

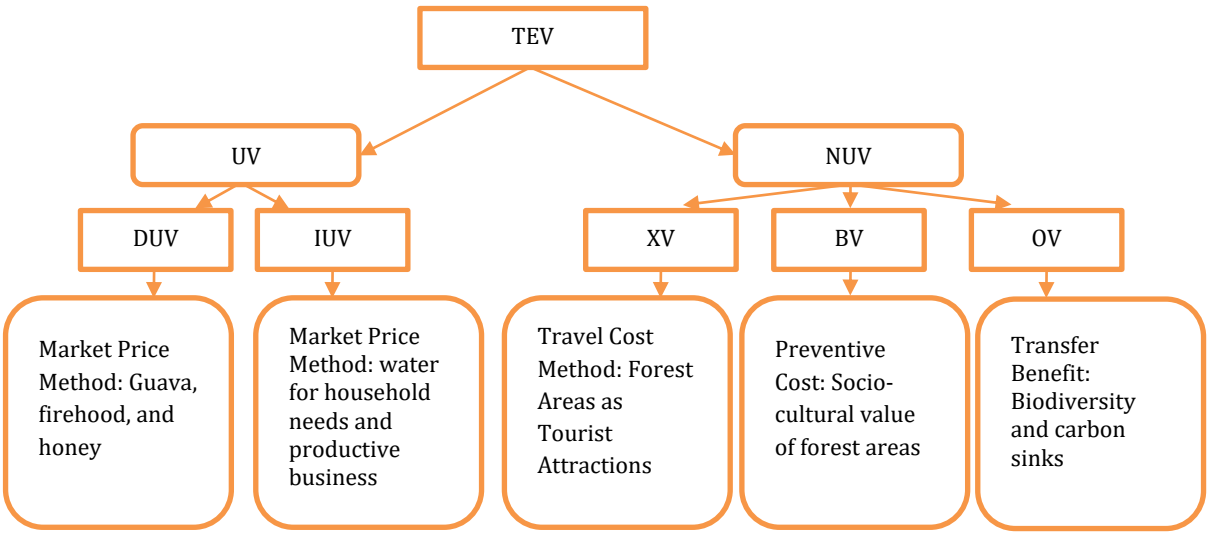

Figure 2. Data Analysis Framework for Economic Valuation

Ignatyeva et al., (2022) stated that approaches to economic assessment of natural resources including forestry are grouped into cost, income, rent and normative approaches. This assessment approach implemented in the Direct Use Value (DUV), Indirect Use Value (IUV) and Non-Use Value analysis as follows:

2.4.1. Direct Use Value

Direct Use Value used market price method analysis, namely calculating the market value of firewood, guava and forest honey obtained from the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, North Central Timor Regency. Salsabila et al., (2022) stated that measuring Direct Use Value uses the market price method for natural resources.

2.4.2. Indirect Use Value

Indirect Value used market price method by calculating household water usage and business (fresh water fish, vegetables, betel and areca nuts). (Ghosh & Bandhyopadhyay, 2009; Ghobadi & Moridi, 2023) stated that water resource measurement engaged water cost practically to analysed the policy about water resource allocation. Water economy value for each application is added to result the total of water economy value. The form is:

$$TEW = VWH + VWF + VWV + VWAN + VWB \quad (4)$$

Information:
TEV : The Total Economic Value of Water
VWH : The Value of Water for Household
VWF : The Value of Water for Fisheries
VWV : The Value of Water for Vegetables
VWAN : The Value of Water for Areca Nut
VWB : The Value of Water for betel

2.4.3. Non-Use Value

Non-use value measurements are grouped into 3, namely:

a. Measuring existence value uses the travel cost method, namely calculating the amount of costs incurred by visitors (tourists) at natural resource locations. Ignatyeva et al., (2022) stated that the travel cost method is a sociological approach to measure the willingness to pay for environmental benefits based on the costs used to travel to natural resource locations.
b. Measuring bequest value uses a preventive value approach by measuring the value of money used by indigenous peoples every year in carrying out traditional rituals in the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, TTU Regency. Bjärstig & Sténs, (2018) stated that forest areas also contribute to social values that are inherent in local communities, so that forest area valuations must also include the social values of forest areas.
c. Measuring the option value in the form of biodiversity and carbon absorption values uses the benefit transfer method, namely comparing it with the calculated value of biodiversity and carbon absorption in tropical forests generally in Indonesia. Minister of Environment Regulation Number 15 of 2012 states that the calculation of the value of forest biodiversity in Indonesia refers to Natural Resources Management from USAID research (1998) of $ 9.45 per ha per year, and carbon sequestration of $ 5 per ha per year.

3. RESULT AND DISCUSSION

Economic valuation in the Bifemnasi-Sonmahole Forest Area, especially in Taekas Village (18 km2) and Femnasi (14 km2) whose residents are enclaves in this forest area. Hidayat (2020) stated that economic valuation is more comprehensive in measuring the value of the ecological, social, and economic benefits of natural resources compared to market mechanisms which is focus more on the value of utilizing natural resource products. Economic valuation is categorized into use value and non-use value. Use values are grouped into direct use values and indirect use values,

while non-use values are grouped into existence values, bequest values, and option values.

3.1. Use Value

3.1.1. Direct Use Value

The Bifemnasi-Sonmahole Forest area, especially in Taekas and Femnasi Villages, is used directly by the people of both villages to obtain firewood, guava and forest honey. Sari et al., (2022) stated that forests have direct benefits felt by the community, such as wood. The results of the analysis of the economic value of firewood, guava and forest honey in the Bifemnasi-Sonmahole Forest Area, especially in Taekas and Femnasi Villages, are shown in Table 1.

The research results found that the total direct use value of the Bifemnasi-Sonmahole forest area in Taekas and Femnasi Villages was IDR 236,210,000. The largest contribution came from guava extraction (56.96%), while the contribution from firewood and forest honey was relatively small, namely 30.38% and 12.66%. The direct benefit value of the forest area contributes to the formation of GRDP in the agricultural sector of TTU Regency. Previously, Masiun (2020)emphasized that the value of direct use of forest areas contributes to gross regional domestic product (GRDP).

3.1.2. Indirect Use Value

An indirect benefit from the Bifemnasi-Sonmahole Forest Area, especially in Taekas and Femnasi Villages, TTU Regency is the water source from the forest area which is used for household needs and productive businesses. Productive businesses include the cultivation of areca nut, betel, vegetables and freshwater fish. Pak et al., (2010); Nitanan et al., (2020) stated that non-timber forest products can also ought to be assessed to obtain comprehensive forest benefit values. The results of the indirect benefit analysis are shown in Table 2.

The research results found that the total indirect use value of the Bifemnasi-Sonmahole Forest Area, especially in Taekas and Femnasi Villages, TTU Regency, was IDR 2,296,438,400. The largest contribution from water use for household needs was IDR 1,567,238,400 (68.25%). The value of water uses from the Bifemnasi-Sonmahole forest area in productive businesses in Taekas and Femnasi Villages, TTU Regency is IDR 729,200,000 (31.75%) which includes betel and areca nut businesses (24.58%), while for fisheries and vegetables are relatively smaller (7.18%). Water from the Bifemnasi-Sonmahole forest area experienced a decrease in benefits because in previous years it was used by residents in Kefamenanu City as the capital of TTU Regency (1970-2000), and in 2000-2010 it was used by 50% of residents in East Miomaffo District. Since 2020, this water has only been used by residents in Taekas and Bifemnasi Villages. This condition occurs due to increased settlements and dry land agricultural activities around forest areas; As the results of a previous study from Setiyani (2012) stated that the benefits of water resources were higher if the surrounding area was greener than if there were deforestation and no plants.

3.2. Non-Use Value

The non-use value of the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, North Central Timor Regency includes existence value, bequest value and option value. The existence value of the Bifemnasi-Sonmahole Forest Area is the economic impact of tourism activities in the Bifemnasi-Sonmahole forest area, especially Taekas and Femnasi Villages. The bequest value is the socio-cultural activities of the enclave community and the community around the Bifemnasi-Sonmahole forest area in Taekas and Femnasi Villages. Apart from that, there is an option value for the community around the forest area to preserve it for the next generation. Harini et al., (2024) stated that economic analysis of forest areas needs to include the value of non-use (intangible) benefits in forest areas because their value is quite large. The results of non-use value data analysis in the Bifemnasi-Sonmahole Forest Area, North Central Timor Regency are shown in Table 3.

Table 1. Results of Direct Use Value Analysis of the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, North Central Timor Regency Per Year

No	Description	Quantity	Price (IDR)	Value (IDR)
1	Firehood (bundle)	14,352	5,000	71,760,000,-
2	Guava (bundle)	26,910	5,000	134,550,000,-
3	Honey (bottle)	598	50,000	29,900,000,-
	Total			236,210,000,-

Table 2. Results of Indirect Use Value Analysis of the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, North Central Timor Regency Per Year

No	Description	Amount	Price (IDR)	Value (IDR)
1	Aceca Nut (bunch)	2,270	100,000	227,000,000
2	Betel (bundle)	75,480	5,000	337,400,000
3	Vegetables (bed)	27	200,000	10,800,000
4	Fresh water Fish (kg)	3,850	40,000	154,000,000
5	Household Needs (L)	12,055,680	130	1,567,238,400
	Total			2,296,438,400

Figure 3. Water Resources in Forest Area

Table 3. Results of Non-Use Value Analysis of the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, North Central Timor Regency Per Year

No	Non-Use Value	Money (IDR)	Explanation
1	Existence Value	109.500.000	Travel cost method for tourist visits
2	Bequest Value	132.000.000	Preventive cost method for the value of sacrifices for carrying out traditional rituals at traditional sites in the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages
3	Option Value	573.376.000	Transfer benefits for biodiversity and neutralize carbon in the air.

3.2.1. Existence Value

The Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages is also a Greater Tunbaba Tourist Area which has the attraction of mountains, forests, grasslands, offroad and its location close to Kefamenanu City makes it a tourist location that is busy visiting. The problem is that tourist locations have not been properly arranged, including not being equipped with tents or huts for shelter when it rains or is hot. The impact is that the number of visitors fluctuates, namely quite a lot from April to April. December, while January-March is relatively small or even non-existent. The average number of tourists is 12 people per day, and they spend an average of 4 hours per day. Rahayu & Haryati, (2022) stated that the travel cost method is used to analyze the value of certain tourist attractions.

The average cost for tourists to travel to the Bifemnasi-Sonmahole Forest Area in TTU Regency is IDR 25,000; where the cost used for travel costs is IDR 15,000, - and spent on local food is an average of IDR 10,000, - per person per day. Therefore, the existence value is IDR 109,500,000 per year. The existence value is relatively small because the tourist location only relies on nature and its proximity to Kefamenanu City. Tourist locations have not received any structuring from the government, private sector or the community because they are constrained by the location's status as a protected forest area. Subardin (2009) stated that travel costs incurred by tourists are costs that can be converted into conservation costs so that natural beauty remains sustainable.

3.2.2. Bequest Value

The Bifemnasi-Sonmahole forest area, especially in Taekas and Femnasi villages, uses it to carry out cultural activities in the form of annual traditional rituals to make nature friendly so that food is sufficient, and the surrounding community is provided with health. Locations used as traditional ritual events cannot be converted for other purposes. Parera et al., (2024) stated Humans and nature cannot be separated because both have a close relationship as an ecosystem. Every year certain tribes (Ukat, Sakunab, Bana, Kofi, Nabu, Taena, Taus, Siki/Ulan, Talan, Kolo, Kapitan, Binsasi, Sila, Nule, and related tribal groups) carry out traditional rituals at cultural sites in the Bifemnasi-Sonmahole Forest Area, especially Taekas and Femnasi Villages. The people of both villages stated that these sites could not be valued in any amount of money (their value is infinite) because they believed that if any of the sites were converted or traded to obtain direct economic benefits, it would result in the safety of the tribe and surrounding communities being threatened. Social values like this are difficult for people from outside the region to understand; in line with Lidestav et al., (2020) who stated that social values are inherent in communities around forest areas and outside

communities have difficulty identifying and defining them.

Traditional ritual events that are carried out are usually intended to prevent damage to natural resources naturally or caused by living creatures. Therefore, the approach used to analyze the bequest value is the value of sacrifices for carrying out traditional rituals every year in order to prevent damage to forest areas; which means the assessment uses a preventive cost approach as stated by Ignatyeva et al., (2022). The total value of sacrifices is IDR 132,000,000 per year. The sacrifices prepared by the local community include animals (pigs or cows, chickens, rice and local food, drinks, betel nut, candles).

3.2.3. Option Value

Option value is a forest benefit that is maintained for the benefit of inheritance for future generations. The option value includes biodiversity (flora and fauna) and forest use for educational purposes. The flora and fauna in the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages is quite varied. Karmini et al., (2021) stated that forests have trees that have ecological and economic functions.

There are 34 types of flora in the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages, TTU Regency, including: Kabesak (Acacia leucophloea Roxb.), Acacia (Acacia auriculiformis A. Cunn.ex Benth), Pulai (Alstonia scholaris L.R.Br.), betel nuat (Areca catechu L.), Langir (Albizia saponaria Lour. Blume ex Miq.), Candlenut (Aleurites moluccanus L. Wild.), Acer (Acer niveum), Srikaya (Annona squamosa L.), Randu (Bombax ceiba L.), Bamboo (Bambusa sp), Tengguli (Cassia fistula L), Forest kapok (Ceiba petandra L. Gaertn.), Tegining ganang (Cassia planisiliqua L.), Trengguli wanggang (Cassia javanica Sieber ex Benth), Flamboyan (Delonix regia Standl), Sonokeling (Dalbergia latifolia Roxb.), Eucalyptus alba (Eucalyptus alba Reinw. ex Blume), Banyan (Ficus benjamina L.), Strangling banyan (Ficus annulata Blume), Elo (Ficus glomerata Roxb.), Lamtoro (Leucaena leucocephala Lam. de Wit), Mango (Mangifera indica L.), Umbrella leaf (Macaranga tanarius L. Mull.Arg), Red wood (Pterocarpus indicus Wild.), Kedondong (Spondias dulcis Parkinson), Johar (Senna siamea Lam.), Kesambi (Schleichera oleosa Lour.), Water guava (Syzygium aqueum Burm.f.Alston), Mahogany (Swietenia macrophylla King), Kepuh (Sterculia foetida L.), Ketapang (Terminalia catappa L), Jayi (Tectona grandis L.f.), Tamarind (Tamarindus indica L.), and Pine (Casuarina junghuhniana Miq.). In line with Binsasi & Bani (2021) in Fatusene Village which is directly adjacent to Taekas and Femnasi Villages in the Bifemnasi-Sonmahole Forest Area.

There are 8 types of fauna consisting of: Turtledove (Streptopelia chinensis L.), Gray bentet (Lanius schach), Civet (Paradoxurus hermaphroditus Pallas), Cuscus (Phalanger orientalis Pallas), Squirrel (Tupaia sp), Long-tailed macaque (Macaca fascicularis Raffles), Bat (Chiroptera sp), and partridge (Gallus gallus L). Sawitri & Garsetiasih (2015) stated that the Columbidae bird habitat is a conservation forest area. Results of the economic valuation analysis of biodiversity in the Bifemnasi-Sonmahole Forest Area in Taekas and Bifemnasi Villages based on a benefit transfer cost of IDR 374,976,000.

The Bifemnasi-Sonmahole Forest Area also plays a role in maintaining climate stability, through carbon sequestration. Taena et al., (2016) stated that institutional design for natural resource management that is adaptive to climate change is needed so that communities that utilize natural resources are resilient to climate change. The benefit value of carbon absorption from the Bifemnasi-Sonmahole Forest Area in Taekas and Femnasi Villages in North Central Timor Regency is IDR 198,400,000,- based on the benefit transfer approach.

Figure 4. Vegetation in Forest Area

The total non-use value is IDR 814,876,000. The total economic benefit value of natural resources in the Bifemnasi-Sonmahole Forest Area in Taekas and Bifemnasi Villages, North Central Timor Regency is IDR 3,347,524,400. Forest and water conservation is very much needed to increase the value of its benefits in the future. In line with Sondak et al., (2019); Haghjou et al., (2015) stated that the government can design development programs and increase community participation to implement forest area conservation so as to increase ecological value. Shah et al., (2022) stated that proper natural resource assessment not only increases understanding of ecological benefits but also increases the role of natural resources in sustainable economic growth.

4. CONCLUSSIONS

Based on the results of the analysis, it was concluded that the total benefit value of the Bifemnasi-Sonmahole forest area in Taekas and Femnasi Villages, North Central Timor Regency is IDR 3,347,524,400. Direct Use Value of IDR 236,210,000 (7.06%) and Indirect Use Value of IDR 2,296,438,400 (68.60%); while the Non-Use Value is IDR 814,876,000 (24.34%). Therefore, it is necessary to increase community participation and the role of government in carrying out forest conservation to realize real participation in sustainable development. The limitation of this research is that it has not carried out a comprehensive assessment of the entire Bifemnasi-Sonmahole forest area.

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