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Economic value of mangrove forest on untung Jawa Island; Other outputs of the gnrm program in strengthening lecturers and students awareness to the Jakarta coastal sustainability

Raihan, Mulki Siregar, Achmad Sutrisna, Aryo Sahid Sujiwo, Untung Setiyo Purwanto
GNRM Team, Jakarta Islamic University, Jakarta, Indonesia

Abstract
Mangrove forest is widely cited as an ecosystem with a high economic value, implying that mangrove forest preservation should be maintained. However, mangrove forests the management faces various complex problems. While mangrove forest provide various types of life support products, this ecosystems is under constant pressure due to natural factors and human activities. This study aims to evaluate the economic values of mangrove forests in Untung Jawa Island, Jakarta Province by comparing these values with values prevailing in other regions in Indonesia. The results indicate that the economic values of mangrove forests in Untung Jawa Island are different from the values prevailing in other regions. This finding supports the notion that the mangroves characteristics in a certain area actually have different from the mangroves characteristics in other areas. These differences in the characteristics, and of course the preferences differences of the people around mangrove forests, have implications for the emergence of differences in the economic values of the mangrove forests in Untung Jawa Island. The findings imply that mangrove management requires an approach that can balance the interests of environmental sustainability and benefits for human welfare. One approach could be taken is conducting a comprehensive study of several aspects including ecological, social, economic, institutional, and regulatory and legal aspects.

Keywords: mangrove forest, economic valuation, Jakarta coastal

Introduction

The literature notes that Indonesia is a country that has 4,251,011 ha of mangrove forests. The extent of the mangrove forest makes Indonesia a country that has the largest mangrove area in Southeast Asia. Mangrove forest is a natural resource that has an important role for human life. In addition to acting as a buffer for the life of flora and fauna in the balance of the ecosystem, mangrove forests are also a form of natural wealth that is a source of foreign exchange for a country. However, the increasing demand in various fields such as agriculture, infrastructure, land needs, and other sectors. This has caused pressure on mangrove forests to be even higher. The action of expanding residential land and shrimp ponds in coastal areas causes the degradation of mangrove forests to be very high so that the area of mangrove forests is decreasing. This kind of condition cannot be separated from human activities who do not understand the sustainability and benefits of mangrove forests (Kurniawati & Pangaribowo, 2017).

Economic valuation is an attempt to provide a quantitative value for goods and services produced by natural resources and the environment regardless of whether the market value of these goods and services is available or not. Economic valuation is an important job to do because many people do not know that mangrove forests have great economic benefits, so that mangrove forests should not be cut indiscriminately.

The results of this economic assessment of mangrove forests can be used as a reference in terms of preparing coastal area management strategies. This kind of valuation can also raise awareness for coastal communities to maintain the existence and sustainability of mangrove forests. In this regard, it is important to note that the destruction of mangrove forests will have a negative impact on the community both directly and indirectly. The literature shows that the expansion of residential land and ponds in coastal areas will cause the degradation of mangrove forests to increase (Harahab, 2010) [5].

So far, many people judge mangrove forests only from their direct use value. The ecological function of mangrove forests has received less attention in the management of mangrove forests. Whereas the indirect use value of mangrove forests can provide significant benefits for the community. As an illustration, mangrove forests can act as a barrier to abrasion, protection against wind and waves, and a store of carbon stocks. Meanwhile, ecologically, mangrove forests can act as spawning grounds and care for biota, bird nesting sites, and other marine biota habitats (Harahab, 2010) [5].

Calculation of the economic value of mangrove forests is an attempt to evaluate the benefits and costs of these resources in a monetary form that considers the environment. Coastal ecosystems have high economic value, but the sustainability of these ecosystems is threatened. With this unique potential and economic value, coastal areas are also faced with high threats. Therefore, coastal areas need to be handled specifically so that mangrove forests can be managed sustainably. Mangrove forest is a natural resource that has great potential as a source of foreign exchange earnings and a source of livelihood for the community (Setiyowati et al., 2017) [14]. Mangrove forests are natural resources that have various benefits for the community in terms of social, economic, and ecological aspects. The potential of this natural resource requires good management, so that its use can take place sustainably. The economic value of mangrove forests is not easily recognized, so the existence

of mangrove forests is often ignored in a coastal area development plan. The problem of the economic value of mangrove forests arises because the form of goods and services produced by this ecosystem are not traded in the market, so they do not have value that can be enjoyed directly (Fadhila et al., 2015) [2].

The economic benefits of a resource can be defined as the economic value of resource utilization. In this connection, the economic value of mangrove forests is the direct use of the forest. While the ecological value of a resource is related to the functions contained in the resource and related to the environmental services of the resource. Therefore, the ecological value of a resource is the value of the indirect use of the resource. Economic valuation is the giving of economic value to all the benefits and services provided by a resource. The total value of the economic valuation is very important to know and be integrated in regional planning. In other words, planning for coastal areas with various types of land use activities must take into account the economic value and ecological value of a resource (Harahap, 2011).

The importance of the role and function of the mangrove ecosystem raises the challenge of knowing how to provide a comprehensive value for these benefits. The assessment process is carried out by assigning a price to the goods and services produced. The value of goods and services produced by the mangrove ecosystem includes two types, namely use value and non-use value. The use value itself includes the value of direct, indirect and optional use, while the value without use includes the value of existence and the value of inheritance (Kurniawati & Pangaribowo, 2017). In general, this study aims to compare the total economic value of mangrove forests in Pulau Untung Jawa Village, Kepulauan Seribu, Jakarta with several other mangrove forests in Indonesia. The results of this study are expected to be input for information in the preparation of the concept of mangrove forest resource management in Untung Jawa Island Village, Thousand Islands, Jakarta.

Literature Review and Research Methods

Mangrove Ecosystem

The literature defines the term mangrove differently, but basically refers to the same thing. In this case, mangroves can be defined as plants found in tidal areas or as communities; typical littoral plant formations on protected tropical and sub-tropical coasts; forests that mainly grow on alluvial mud soils in coastal areas and river mouths that are affected by tides; or forest that includes a variety of tree species including Rhizophora, Bruguiera, Aicennia, and Ceriops. The term mangrove can refer to their habitat and plant species. Mangrove plants have a special ability to adapt to extreme environmental conditions, such as flooded soil conditions, high salt content and unstable soil conditions. Under such environmental conditions, some types of mangroves have developed mechanisms that allow them to actively remove salt from the tissues, while others have developed a respiratory root system to help obtain oxygen for their root system (Noor et al., 2006) [9].

Furthermore, the literature suggests that mangrove forests are a very beneficial habitat for many living things, including humans. Physically, mangrove forests maintain a stable coastline, protect beaches and riverbanks, prevent marine erosion and trap pollutants and waste, accelerate land expansion, Protect areas behind mangroves from crashing and waves and strong winds. Mangrove forests also prevent salt intrusion towards land; treat organic waste, and so on. In addition, mangrove forests can reflect, transmit, and absorb tsunami wave energy which is manifested in changes in tsunami wave height as it propagates through the clump (Bengen, 2002; Wahyuni et al., 2014) [1, 16] .

Biologically, mangrove forests have a function as a breeding area, spawning grounds, and looking for food for various organisms of economic value, especially fish and shrimp. In addition, mangrove forests are also a source of germplasm. Falling mangrove leaves are decomposed by fungi, bacteria and protozoa into simpler organic components which are a source of food for many aquatic biota such as shrimp, crabs and others. The diversity of fauna in mangrove forests is quite high. The diversity of fauna in the forest can be broadly divided into two groups, namely aquatic fauna such as fish, shrimp, shellfish, and others; and terrestrial groups such as insects, reptiles, amphibians, mammals, and birds (Hairunnisa et al., 2018) [4].

Broadly speaking, the economic functions of mango forests are as follows. The first is the wood producer; such as firewood, charcoal and wood for building materials and household furniture. The second is the producer of industrial raw materials; for example pulp, paper, testil, food, medicine, alcohol, cosmetics and dyes. The third is the producer of fish seeds, shrimp, shellfish, bird eggs and honey. Fourth is as a tourism object; The characteristics of the forest, which is in the transition between land and sea, are unique in several ways. This tourism activity can provide direct income for mangrove forest managers. Mangrove forest ecotourism is also able to grow the economy of the surrounding community by providing employment and business opportunities, such as opening food stalls, playgrounds, or lodging (Wahyuni et al., 2014) [16].

Economic Valuation

The literature generally refers to economic valuation as a method used to assign a quantitative value to goods and services produced by natural resources and the environment regardless of market or non-market value. The economic value of a good or service is measured by adding up the willingness to pay of many individuals for the goods or services in question. WTP reflects an individual's preference for an item. Thus, economic valuation in the context of the environment is about measuring people's preferences for a good environment compared to a bad one. Valuation is the basis for sustainable development thinking (Suzana et al., 2011) [15].

In principle, economic valuation aims to provide economic value to the resources used in accordance with the real value from the community's point of view. Thus, in carrying out economic valuation, it is necessary to know the extent of the bias between the price that occurs and the real value that should be determined from the resources used. Next is what causes the price bias. In the context of the environment, what must be compared is one item with a price, and one item without a price (Widiastuti et al., 2016) [17].

In every activity or policy, costs and benefits are always encountered as a result of the activity or policy. As a basis for stating that an activity or policy is feasible or not, an assessment or valuation of the impact of an activity (policy) on the environment is required. The impact of an activity can be direct or indirect. These impacts can also be expressed as primary impacts and secondary impacts. The

direct impact or primary impact is the impact that arises as a result of the main objective of the activity or policy, both in the form of costs and benefits.

Based on the view of ecological economics, the purpose of resource economic assessment is not only related to maximizing individual welfare but also related to ecological goals and distributional justice. The purpose of economic valuation is basically to help decision-makers to estimate the economic efficiency of various possible uses for ecosystems in coastal areas. The definition of value, especially regarding goods and services produced by natural resources and the environment, can indeed be different when viewed from various disciplines. In general, economic value can be defined as a measurement of the maximum amount a person wants to sacrifice goods and services to obtain other goods and services (Zuraidah & Syahfitri, 2015) [18].

According to Pearce and Turner (1991), environmental services are basically valued based on consumers' willingness to pay and producers' willingness to receive compensation. The willingness of consumers to pay can be interpreted as how much people are willing to pay to repair a damaged environment, while the willingness of producers to receive compensation is how much people are willing to pay to prevent environmental damage due to a decline in environmental quality. Willingness to pay or willingness to receive reflects individual preferences, willingness to pay and willingness to accept are parameters in economic assessment (Pearce and Moran, 1994). Mathematically, the total economic value of mangrove forests can be formulated as follows (Harahap, 2011).

TEV = UV + NUV
UV = DUV + IUV + OV
NUV = BV + EV
TEV = UV + NUV = (DUV + IUV + OV) + (BV + EV)

Where
TEV = Total Economic Value
UV = Use Value
NUV = Non Use Value
DUV = Direct Use Value
IUV = Indirect Use Value
OV = Option Value
BV = Bequest Value
EV = Existence Value

Research methods

This study uses a literature study on the economic assessment of mangrove forests in various regions of Indonesia. This literature review was conducted to better understand the current conditions in ecosystem economic assessment and mangrove management. The research was carried out through the stages of definition and topic, search and selection of studies, analysis and synthesis. The definition stage is carried out by explaining the economic assessment and management of mangrove forests. The research topic focuses on four dimensions, namely direct use value, indirect use value, choice value, and existence value.

Results and Analysis

General condition of Untung Jawa Island

Untung Jawa Island is a part of the Thousand Islands Administrative District, Jakarta Province. The area of Untung Jawa Island is 40.1 ha, most of which is functioned as a residential area. Untung Jawa Island has adequate facilities and infrastructure, such as pedestrian paths, clean water treatment with Reverse Osmosis, electricity, as well as land and sea transportation. All existing facilities on Untung Jawa Island can be enjoyed by the surrounding community and are able to encourage people outside Untung Jawa Island to carry out various activities. Untung Jawa Island has a beach with white sand that can be used for various activities, such as fishing, swimming, cycling, and watersports. Untung Jawa Island also has Mangrove forests which are used as tourist attractions. The area of mangrove forest on this island is about 3.1 ha. The types of mangroves on Untung Jawa Island are Rhizopora mucronata and Avicennia alba. R. Mucronata is the dominant mangrove species in this area (Prasetyo et al., 2016).

Mangrove economic value

The literature shows that basically the economic value of mangrove forests can be grouped into two, namely economic value on the basis of use or utilization and economic value on the basis of non-use or utilization. The value on the basis of use indicates the ability of the environment if it is used to meet needs, while the value on the basis of non-use is the value attached to the environment. Value on the basis of use can be further divided into value on the basis of direct use, value of indirect use, and value on the basis of choice of use. Furthermore, value on the basis of non-use can be divided into value on the basis of inheritance from previous generations and value because of its existence (Hairunnisa et al., 2018) [4].

Table 1 presents the economic values of mangrove forests in several parts of Indonesia.

Table 1: Economic value of mangrove forests (Rp./ha/year)

Location (Province)	Direct use value	Indirect use value	Option value	Existence value
Jakarta	131.708.971	2.500.200.000	-	-
West Java	124.521.219	504.359	133.383	1.309
Central Java	8.082.974	10.625.909	4.380.117	-
East Java	19.231.301	76.112.728	148.335	-
North Sulawesi	36.555.000	2.549.291.526	195.000	202.416
South Sulawesi	18.108.333	928.310.503	135.200	-
Gorontalo	10.209.892	156.062.008	1.565.700	3.500.000
Central Sulawesi	55.782.849	155.649.952	199.500	-
Bengkulu	42.140.000	2.627.830.000	195.255	423.077
East Kalimantan	13.775.213	1.254.525	1.201.743	449.514

Source: Prasetyo et al. (2016); Kurniawati & Pangaribowo (2017); Fadhila et al. (2015) [2]; Harahap (2011); Hairunnisa et al. (2018) [4]; Fidyansari & Hastuty (2016); Nahib & Sudarmadji (2010); Putranto et al. (2017); Rospita et al. (2017) [13]; Wahyuni et al. (2014) [16];

Direct use value of mangrove forest

As shown in Table 1, it is known that the lowest direct use value of mangrove forest is 8,082,974 rupiah per hectare per year (West Java province) and the highest direct use value of mangrove forest is 131,708,971 rupiah per hectare per year (Jakarta province) and the average value is 46,011,575 rupiah per hectare per year. In this case, the literature generally suggests that direct use value is goods and services contained in a resource that can be directly utilized. The market price of a resource will be used to calculate the direct use value of the mangrove ecosystem. The market price is the local selling price for the product marketed using the net price. Direct use of mangrove forests is all forms of human activity, both individuals, groups, private and government related to the use of mangrove forests and their components for various interests and purposes. The direct use of this mangrove forest includes fishing, crab, shrimp, and shellfish activities; fish/crab cultivation; development of plant-based foods derived from mangroves; and tourism development (Kurniawati & Pangaribowo, 2017).

Furthermore, it was found that the preference for mangrove forest utilization activities between regions was different according to the economic activities that developed in each region. As an illustration, the activities of utilizing mangrove ecosystems carried out by members of community groups in an area include fishing, fishing with traditional nets, catching fish by floating, silvofishery crab ponds, and mangrove tourism activities while in other areas community groups only do silvofishery crab farming (Indartik). & Personal, 2019; Pearce, 2001) [10].

The next type of direct benefit of mangrove forests is ecotourism. Mangrove ecotourism activities are also widely developed by community groups in the form of fringing the edges of mangrove forests using canoes and boats. Culinary tourism activities can also be carried out in mangrove forests with the main menu in the form of silvofishery-cultivated fish and crabs developed by community members, as well as various snacks made from mangrove plant products such as syrup, cakes, lunkhead, candy, sweets, and chips. In addition, the community has also begun to develop mangrove fruit as a natural textile dye in the batik-making process (Indartik & Pribadi, 2019; Pearce, 2001) [10].

Researchers generally calculate the economic value of mangrove forest ecotourism by using the travel cost method, which is the total cost incurred to get to the location. Similar to the benefits of fishery productivity, several previous studies that have the same benefits as ecotourism but when quantifying the economic value obtained different results in each location, for example in the Margasari mangrove ecotourism, East Lampung, the economic value of ecotourism is Rp. 15,229.00/ha / year and mangrove tourism in Blanakan Bay, Subang Rp.85,025.00/ha/year (Ariftia et al, 2014; Indrayanti et al, 2015). The difference is caused by the type and amount of travel costs incurred by visitors in each area, for example, for famous tourist objects usually have more expensive ticket prices. Besides that, the factor of origin of the visitor affects the size of the transportation costs incurred by each visitor. (Kurniawati & Pangaribowo, 2017)

Indirect use value of mangrove forest

Furthermore, the results of the study as presented in Table 1 show that the lowest indirect use value of mangrove forest is 504,359 rupiah per hectare per year (West Java province) and the highest indirect use value of mangrove forest is 2,627,830,000 rupiah per hectare per year (Bengkulu province) and the average value -the average is 900,584,151 rupiah per hectare per year. Indirect use value is the value of goods and services that exist because of the existence of a resource that cannot be directly extracted from these natural resources. The literature shows that one of the indirect use values of mangrove forests that is widely studied is the benefits of mangrove forests as breakwaters. This value is calculated using the cost approach incurred to build gabions or breakwaters with the assumption that there is no mangrove ecosystem. Construction of concrete breakwaters with standards used for breakwaters at locations facing the high seas (Kurniawati & Pangaribowo, 2017) [7]. Furthermore, the indirect use value of mangrove forests which is considered by many researchers is the function of mangrove forests as tourist sites. In general, researchers use the travel cost method approach to calculate the benefits of mangrove forest tourism. This method is a method that is widely used to estimate the economic value of a commodity that has no market value. This economic value is estimated by using the cost of travel which includes round-trip transportation costs, and other expenses during the trip and within the tourist area. The literature shows that the value of indirect benefits from the mangrove ecosystem provides the highest proportion compared to the values of other benefits from the ecosystem. The values of these indirect benefits include the role of mangrove forests as abrasion barrier, seawater intrusion barrier, carbon sink, and oxygen producer. The values of these indirect benefits also include the benefits of mangrove forests as a provider of shrimp and crab feed, in addition to being a guardian of the stability of the food cycle.

Value of choice of mangrove forest

As shown in Table 1, it is known that the lowest mangrove forest selection value is 133,383 rupiah per hectare per year (West Java province) and the highest mangrove forest selection value is 4,380,117 rupiah per hectare per year (Central Java province) and the average value is 906,026 rupiah per hectare. Per year. The value of the choice of mangrove forests is the benefits of existing mangrove forests that have not been developed by the surrounding community but are considered to have value in the future, or the benefits of maintaining the use of goods, services, and mangrove forest resources in the future that are currently not used. (Indartik & Personal, 2019). Examples of preferred values are biodiversity and conserved habitats. The calculation of the option value is approximated by the biodiversity value calculated by the benefit transfer method. The literature analogizes the value of choice as an insurance that people pay to guarantee future use of resources. The calculation of the option value is approached from the benefits of maintaining mangrove forests for biodiversity (Kurniawati & Pangaribowo, 2017). The estimation of the value of mangrove forest options is obtained from the results of research in other locations or by the benefit transfer method, which is an approach that uses the benefits of mangrove forests from certain places that have been calculated which are then transferred to obtain the value of benefits elsewhere. The benefit transfer method is used by assuming that the condition of the mangrove ecosystem to

be assessed has relatively the same characteristics as the condition of the mangrove ecosystem being referred to. In many studies, the value of the benefits of choosing mangroves at certain locations is calculated using the value of the diversity of mangrove ecosystems carried out in Bintuni Bay, Irian Jaya, which is US $ 15 per hectare. By converting the dollar exchange price to 2021, the area of the mangrove ecosystem and the regional minimum wage, the value of the benefits of choice at that location is obtained (Indartik & Pribadi, 2019; Kurniawati & Pangaribowo, 2017) [6, 17].

The value of the existence of mangrove forests

Existence benefits are the benefits felt by the community regarding the existence of the mangrove ecosystem. Determination of the value of the existence of benefits can be known by the method of approach to the willingness to pay. Existence value can also be referred to as a person's willingness to pay to preserve the mangrove ecosystem for future use. The calculation of the value of the existence of this mangrove forest can be done using the Contingent Valuation Method. The literature shows that most people think that mangrove conservation is a very important effort (Hairunnisa et al., 2018; Rospita et al., 2017) [4, 13]. As shown in Table 1, it is known that the lowest value of the existence of mangrove forests is 1,309 rupiahs per hectare per year (West Java province) and the highest value of the existence of mangrove forests is 3,500,000 rupiahs per hectare per year (Gorontalo province) and the average value is 915,263 rupiahs per hectare. Per year.

Total economic value of mangrove forest

The total economic value of mangrove forests is obtained by adding up the direct use value, indirect use value, option value, and the value of the existence of mangrove forests. The results of the analysis show that the lowest total economic value of mangrove forest is 16,680,995 rupiah per hectare per year (East Kalimantan province) and the highest total economic value of mangrove forest is 2,670,588,332 rupiah per hectare per year (Bengkulu province) and the average value is 947,868,781 rupiah per hectare per year.

Proportion of economic values of mangrove forests

The results of the analysis show that the proportion of the indirect value of mangrove forests on the island of Untung Jawa, Jakarta province is the largest component compared to the economic value of other mangrove forests. The indirect value proportion of mangrove forests on the island is around 94.9 percent (Prasetiyo et al., 2016). This result is in line with studies conducted by several other researchers who calculated the economic value of mangrove forests where the dimension of indirect economic benefits occupies the highest percentage compared to other dimensions. As shown in Figure 2, it is found that the indirect use value of mangrove forests has a higher proportion than the direct use value and option value. This indirect use value is often not taken into account by policy makers in development planning that utilizes the mangrove ecosystem. The economic values of mangrove forests indicate that these natural resources require higher appreciation from the community. The economic values of mangrove forests need to be input for quantitative information to determine various policy options; including physical and economic policies. Assessment of the impact of development on natural resources and the environment is a step towards sustainable natural resource management (Hairunnisa et al., 2018) [4].

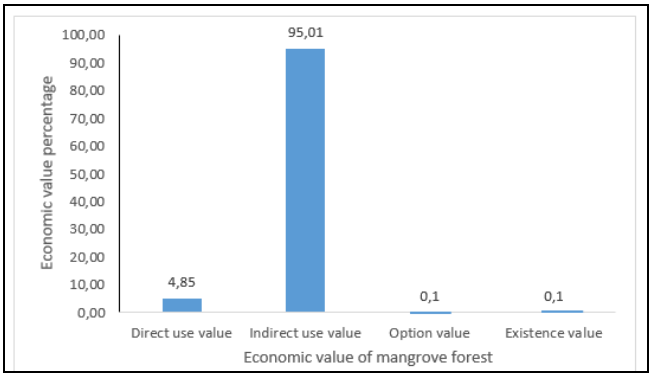

Fig 1: Distribution of the proportion of the dimensions of the economic value of mangrove forests

Efforts towards sustainable mangrove forest management

Economic value valuation can be used to improve mangrove ecosystem management. The results of this analysis can be used as a basis for information on the value of mangrove forests so that all stakeholders, including local communities, appreciate the benefits derived from the mangrove ecosystem. The results of the economic valuation can also be used for policy advocacy for conservation and protection of natural resources, including in determining the conversion of a mangrove area. The calculation of the value of mangroves is important in considering the decision to convert mangroves on a large scale. The results of the economic valuation can be used by decision makers in analyzing the cost benefit of managing a mangrove area. Therefore, it is important for decision makers to consider the results of economic valuations in comparing mangrove ecosystem management with other uses.

The literature emphasizes that mangrove forests can make a major contribution to the community if mangrove forest management is carried out sustainably from upstream to downstream. As an illustration, mangrove forests can be used as an ecotourism area. To support these activities, community groups around the mangrove forest can build a silvofishery business with commodities in the form of fish, shrimp, and crabs. The community can also process non-timber mangrove forest products, in the form of syrup, soap, lunkhead, and pastries. The results of these activities can be marketed by the community through the restaurants they have established. The sustainability of this integrated mangrove management activity requires legal aspects, including the required land management. In addition, the community can also carry out sustainable mangrove use activities, namely by utilizing mangrove fruit for batik dyes.

In this case, the literature emphasizes that sustainable mangrove management is not only about commodities and permitted use activities, but also needs to pay attention to the legal aspect as an instrument that ensures the implementation of sustainable use at the operational level. The application of the legal aspect needs to be supported by regulations on incentives and disincentives as a consequence of resource use.

The development of an environmental service business while still paying attention to the carrying capacity of the environment is an alternative to the development of mangrove management.

Conclusion

The economic valuation of mangrove forests on Untung Jawa Island is an attempt to provide a quantitative value for the goods and services produced by the mangrove forest, both on the basis of market value and non-market value. The economic valuation of mangrove forests is an economic tool to estimate the monetary value of goods and services produced by mangrove forests. An understanding of the concept of economic valuation of mangrove forests allows policy makers to determine the effective and efficient use of mangrove forests. This is based on the view that economic valuation is closely related to mangrove forest conservation and economic development. This research is of the view that sustainable development can be achieved if the management of mangrove forests is carried out based on the ability of a harmonious and balanced environment. Utilization of natural resources must be planned by considering ecological conditions and not ignoring economic values so as to improve environmental quality.

The economic benefits of a resource can be defined as the economic value of resource utilization. In this connection, the economic value of mangrove forests is the direct use of the forest. While the ecological value of a resource is related to the functions contained in the resource and related to the environmental services of the resource. Therefore, the ecological value of a resource is the value of the indirect use of the resource. Economic valuation is the giving of economic value to all the benefits and services provided by a resource. The total value of the economic valuation is very important to know and be integrated in regional planning. In other words, planning for coastal areas with various types of land use activities must take into account the economic value and ecological value of a resource (Harahap, 2011). This study found that the parameters of the economic values of mangrove forests in Untung Jawa Island are different from the economic values of mangrove forests in other areas. This finding supports the opinion of many experts that the characteristics of mangroves in certain areas actually have different characteristics from mangroves in other areas in Indonesia. These differences in the characteristics of the mangrove forest, and of course the preferences of the people around the mangrove forest, have implications for the differences in the economic values of the mangrove forests of Untung Jawa Island.

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