Economic Valuation of Marine and Fishery Resources in Tikus Island, Bengkulu City

Zamdial[1], Dede Hartono[2],Octianto Syahputra[3]
[1](Study Program of Marine Science, University Of Bengkulu, Indonesia)
[2](Study Program of Marine Science,UniversityOf Bengkulu, Indonesia)
[3](Study Program of Marine Science, University Of Bengkulu, Indonesia)

ABSTRACT: *Tikus Island is surrounded by coral reefs so that they can protect the island from abrasion due to large waves. The coastal and marine resources on Tikus Island have various ecological and economic functions. The purpose of this study is to calculate and analyze the total benefit value of potential marine and fishery resources in Tikus Island Area, Malabro Village, Teluk Segara District, and Bengkulu City. This research was conducted in March–April 2022. This study used a comprehensive survey method. Sampling using the Purposive Sampling technique Respondents value the benefits of existence, which consist of the level of education, namely the technique of axial sampling. The results of this study indicate that the total benefit value of marine and fishery resources on Tikus Island is Rp. 17,864,844,636,-/year, with a direct benefit value of Rp. 2,487,100,000, indirect benefits of Rp. 181,424,836,-/year, preferred benefits of Rp. 181,424,836,-/year, existence benefits of Rp. 14,833,925,000,-/year, and inheritance benefits of Rp. 245,582,000,-/year.*

KEYWORDS -*Economic Valuation, Tikus Island, Direct Use, Total Economic*

I. INTRODUCTION

Tikus Island is surrounded by coral reefs that are very wide so that they can protect the island from abrasion due to large waves. However, the existence of coral reefs on Tikus Island has long experienced coral degradation by humans. The destruction of coral reefs hurts Tikus Island, as seen by the decreasing area of Tikus Island due to abrasion which is accelerating from year to year. In addition to natural processes, such as wind, currents and waves, human activities are the cause of coastal erosion [1]. The coastal and marine resources on Tikus Island have various ecological and economic functions. Management efforts are carried out by making a balance of marine and coastal natural resources. The monetary balance is prepared with an economic valuation of reserves and utilization of natural resources generate a net benefit for society as measured by economic benefits and allocations reduced by resource costs. Therefore, the welfare distribution factor is one of the important issues for fairer economic valuations as espoused by ecological economists [2-3]. The management approach of coastal ecosystems and small islands can be expressed as a symbiosis of views that respect natural systems, which integrate economic and ecological views, which are nothing but to protect the function of natural systems (ecosystems) to continuously produce ecosystem services, and if there is a decrease in natural resource services (ecosystems) it will result in a decrease in the economic value of ecosystems which certainly has implications for decreasing welfare social[4]. The purpose of economic valuation is basically to help decision making to estimate the economic efficiency of various competing uses that may be carried out on ecosystems in coastal and marine areas and small islands. Economic valuation can be an important tool in increasing public awareness of the use and managementof natural resources and the environment.Knowledge of the value of an ecosystem can be used as a foothold in decision making on development activities to be carried out in the ecosystem. Financial and ecological benefits can be expected In life human needs are not limited

in number, while the availability of resources is very limited. This causes humans to make choices. Economics assumes that humans are rational beings. Choices are made based on profit and loss considerations, by comparing the costs to be incurred and the results obtained.

This paper summarises the calculate and analyze total economic value of potential marine and fishery resources in the Tikus Island Area of Bengkulu City. This research is expected to obtain data and information on the total economic value of marine and fishery resources in the Tikus Island area of Bengkulu City so that it can be one of the sources of information for tourism development in an appropriate, fair, environmentally friendly and sustainable manner as well as for academics and the community to add insight into the economic valuation of marine and fishery resources on Tikus Island, Bengkulu City.

II. LITERATURE REVIEW

Overview of Economic Valuation

The management approach of coastal ecosystems and small islands can be expressed as a symbiosis of views that respect natural systems, which integrate economic and ecological views, which are nothing but to protect the function of natural systems (ecosystems) to continuously produce ecosystem services, and if there is a decrease in natural resource services (ecosystems) it will result in a decrease in the economic value of ecosystems which certainly has implications for decreasing welfare social [5].

There needs to be an understanding of the community and government about the economic values that can be provided by the PulauTikus area as a small island with the potential of its marine and fishery resources. The role of economic valuation of ecosystems and the resources contained therein is important in development policy, including in this case the management of marine and fisheries resources. The loss of ecosystems or environmental resources is an economic problem that cannot be reversed as before[6-7].

Economic valuation can be an important tool in increasing public awareness of the use and management of natural resources and the environment. Knowledge of the value of an ecosystem can be used as a foothold in decision making on development activities to be carried out in the ecosystem. Financial and ecological benefits can be estimated in life, human needs are not limited, while the availability of resources is very limited. This causes humans to make choices. Economics assumes that humans are rational beings. Choices are made based on profit and loss considerations, by comparing the costs to be incurred and the results obtained. Small islands have a great opportunity to be developed as potential resource-based businesses such as fisheries, tourism, transportation services, processed industries and other environmentally friendly industries [8].Management of its potential needs to be carried out an economic valuation study. In addition, research on this matter has never been carried out in the Tikus Island area of Bengkulu City. Therefore, knowledge of the economic valuation of marine and fishery resources is very necessary for optimal and sustainable management.

III. STUDY AREA

This research was conducted using a survey method in March to April 2022 on PulauTikus, TelukSegara District, Malabro Village, Bengkulu City.This study used primary and secondary data. Primary data is obtained through interviews, namely data collection by holding questions and answers with respondents to obtain data related to the use of marine and fisheries resources. Secondary data is obtained by collecting supporting data from related institutions.The data obtained will be analyzed descriptively quantitatively, namely analyzing data by looking at the magnitude in the form of average values, and then presented in the form of tables and figures [9].

IV. DATA DESCRIPTION AND ANALYSIS

The calculation of the value of marine and fishery resources is identified from various benefits and functions of marine and fisheries resources, consisting of use value,direct use value, inderect use value, option value, exsistence value , bequest value and total economic value. The calculation of the economic value of resources can be done by the economic valuation method or Total Economic Value (TEV) Zamdial et al[10], Mathematically, the formula for calculating the economic value of an ecosystem is as follows:

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

For Information

TEV : Total Economic Value
UV : Use Value
NUV : Non Use Value
DUV : Direct Use Value
UV : Inderect Use Value
OV : Option Value
EV : Existence Value
BV : Beguest Value

The identification of the benefits and functions of the PulauTikus ecosystem is grouped into several benefit values, namely direct use value, indirect use value, Option value, existence value and beguest value,Another value benefit from the ecosystem on PulauTikus is the Total economic value. Based on the identification results, the direct use value of the PulauTikuscoral reef ecosystem consist of fisheries benefits, fishery production benefits and tourism benefits[11]. Indirect use value on Tikus Island come from the coral reef ecosystem in the form of physical benefits, these physical benefits are in the form of data on the benefits of the coral reef ecosystem as coastal protection from the threat of waves and carbon sequestration value. Thus, the value of indirect use value is estimated by making breakwaters as a physical function of coral reef ecosystems and the value of carbon sequestration[12].

Based on the results of the analysis, the value of direct use value of capture fisheries in the waters of PulauTikus is Rp. 1,704,000,000,-/year. The total benefit value of tourism is Rp. 744.000.000,-/year. The research value only identifies research conducted during 2017 to 2022 concerning marine science, namely about the Ecosystem on Tikus Island. Research activities carried out on Tikus Island were identified during 2017 to 2022, which was 34 people. The calculation of the value of indirect benefits of the Tikus Island coral reef ecosystem as a breakwater is Rp. 116,812,800,-/year. Based on the results of the analysis, the carbon absorption value of the rat island coral reef ecosystem is Rp. 872,234,790,-/year.

Use Value	Sum (Rp)
Direct benefits of capture fisheries	Rp. 1.704.000.000,-/year.
Direct benefits of tourism	Rp.744.000.000,-/year
Direct benefits of research	Rp. 39.100.000,-/year
Total	**Rp. 2.487.820.000,-/Year**

Fig.1. Total use value.

To calculate the Value of Benefits of the Existence of Marine and Fisheries Resources on PulauTikus, a primary data collection survey was conducted on 3 levels of respondents based on education, namely junior high, high school and college / undergraduate. Based on the median value for each respondent at the level of elementary school, high school, university is Rp. 10,000,000 ,- , Rp. 27,500,000 and Rp. 150,000,000,-,- the average median value of Rp. 62,500,000 is obtained as the value given by respondents to the benefits for the existence of marine and fishery resources on Tikus Island.

The bequest value cannot be calculated by market value, for that reason the Inheritance Benefit Value is estimated to be no less than 10% of the Direct Benefit Value. Direct Benefit Value is Rp. 2.487.820.000,-/year, so Inheritance Benefit Value is Rp. 2.487.820.000,-/year x 10% = Rp. 248.782.000,-/year.

The identification results of the Direct use value, Indirect use value, Option value, Beguest value, Existence value and Benefit of Marine and Fisheries Resources Heritage on Tikus Island which are quantified into Rupiah value, the Total Benefit Value of Marine and Fisheries Resources on Tikus Island is Rp. 17,864,844,636,-/year.

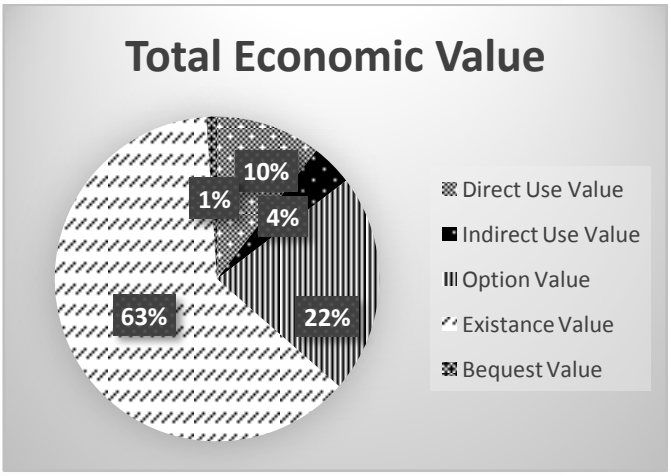

Fig.2. Percentage total economic value.

V. CONCLUSION

The total benefit value of marine and fishery resources on Tikus Island is Rp. 17,864,844,636,-

/yearwith Direct Use Value contributing Rp. 2,487,820,000,-/year, Indirect Use Value of *Rp.* 116.812.800,-/year, Option value of Rp. 81.424.836,-/year, Existence Value of Rp. 14,833,925,000,-/year, and Beguest value of Rp. 245.582.000,-/year. Seeing the large economic valuation value of the benefits of marine and fishery resources on Tikus Island, and very necessary to maintain its sustainability. It is also necessary to socialize the benefits and functions of coral reef ecosystems, considering the many people's ignorance of the benefits and functions of coral reef ecosystems.

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