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Willingness to Pay for Existence Value of Mangrove Ecosystem in Youtefa Bay, Jayapura, Indonesia

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Abstract:

Mangrove area in Youtefa Bay is very important for the local people's lives in around the Youtefa Bay. Willingness to pay (WTP) of the local's people toward the mangrove ecosystem is their appreciation for existence value of mangrove ecosystem. This research explored how much the WTP was given by the local people toward the mangrove ecosystem existence in Youtefa Bay. The data collection was conducted in March to April 2018 located in three villages around the Youtefa Bay, namely Tobati (46 respondents), Enggros (82 respondents) and Nafri Villages (100 respondents). WTP value collection technique used contingent valuation method (CVM). Result of this research showed that there were 92.98% (212 respondents) who were willing to contribute or pay and 7.02 % (16 respondents) were not. The obtained WTP value of respondents ranged between IDR 0 to IDR 200,000.00 with mean WTP of respondent was IDR 56,052.63/year meanwhile aggregate WTP was IDR 28,811,052.63/year. Variables which had significant influence toward WTP value were earnings and participation and seminaries/trainings/workshops regarding to mangrove ecosystem. Meanwhile gender, age, education level and occupation variables didn't make any significant influence toward the given WTP value amount.

Keywords: willingness to pay; contingent valuation method; existence value; mangrove ecosystem; local community; households; Youtefa Bay

JEL Classification: D12; Q23; Q26; Q51; Q57.

Introduction

Mangrove is one of components of coastal ecosystem which makes an important role, either in terms of ecology or in supporting the local people's economic lives. Some of mangrove benefits which have the direct benefits are the sources of firewood, construction materials, aquaculture, fisheries and aquatic biota (fish, crab, oyster, shrimp), etc (Suprpto *et al.* 2015; Mojiol *et al.* 2016; Suharti *et al.* 2016; Triyanti *et al.* 2017), recreation or tourism area (Salem and Mercer 2012; Suprpto *et al.* 2015), also some other direct benefits. At the same moment, other indirect benefits were potential as fish habitats and biota (nursery ground, feeding ground, spawning ground) (Gajdzik *et al.* 2014; Malik *et al.* 2015; Sina *et al.* 2017), coastal protection (Atkinson *et al.* 2016; Hashim and Shahrizzaman 2017), carbon sink and sequestration (Alongi and Mukhopadhyay 2015; Friess *et al.* 2016; Benson *et al.* 2017; Hong *et al.* 2017), water supply, disturbance regulation, environment purification, biodiversity support (Tong *et al.* 2007), health pharmacy materials (Malik *et al.* 2015), and other several indirect benefits.

Indonesia has a huge potential of mangrove resources. The mangrove economical usage value in Indonesia ranged from USD 12.71/ha to USD 975.76/ha, while total of mangrove ecosystem economic value ranged from USD 3,624.98/ha/year to USD 26,734.61/ha/year (Rizal *et al.* 2018). Mangrove in Jayapura coastal area could be found in coastal area of Youtefa Bay Natural Park, scilicet in coastal area of Tobati, Enggros, Nafri, and Entrop Villages. The mangrove area in Youtefa Bay Nature Park was very important for the locals' lives in around the Youtefa Bay area. These tremendous benefits that could be gotten by locals from the mangrove usually made excessive exploitation which causing the damage of mangrove area and affecting on mangrove function decrease. The latest mangrove condition was so worrisome, where the width of mangrove covers in Youtefa Bay Nature Park from 1967 with 511.24 ha, while in 2017 the mangrove width had decreased to 233.12 ha (Hamuna *et al.* 2018). The change of mangrove width is still continuing until this present time as construction activities got high intensity in Jayapura coastal area, like Jayapura ring road construction which was estimated in having impacts toward mangrove forest development either directly or indirectly, mangrove tree logging and mangrove areal conversion became other allotment (Handono *et al.* 2014; Paulangan 2014; Hamuna *et al.* 2018).

One of mangrove ecosystem beneficial value in measurement of value economic total was existence value. Existence value is value given by local people to certain resources due to spiritual, aesthetic, and cultural benefits. This useful value is not related to the usage done by human beings either for present time or for the future time, exclusively as a form of concern upon the existence of resources as an object (Barton 1994). Generally, existence value in economic benefit measurement of a resource defined as someone's maximum amount measurement to give up goods and service to obtain other goods and service. Formally this concept was named as willingness to pay (WTP) of someone toward goods and service that was produced by resources and environment (Fauzi 2006). WTP is a potential usage value from natural and environmental resource service (Hanley and Spash 1993).

WTP had been much used to rate contribution on an existence of natural and environmental resources. Palanca-Tan (2015) studied to find out WTP for sewerage and sanitation services in Metro Manila, Philippines. Trang *et al.* (2017) studied to investigate the household WTP value for improved solid waste management in Thu Dau Mot city, Binh Duong. Saraithong (2016) estimating of WTP for safe beef and Chanchaorenchai and Saraithong (2017) assessment of WTP value for good agricultural practice cabbage. WTP value is also used to know of community awareness for nature conservation and biodiversity (Halkos and Galani, 2013; Jones *et al.*, 2015; Bakaki and Bernauer 2016; Getzner *et al.* 2017). Study of WTP value for coastal ecosystem was usually conducted to appreciation value on existence value of coastal ecosystem like mangroves (Malik *et al.* 2015; Suharti *et al.* 2016; Sina *et al.* 2017), coral reefs (Tseng *et al.* 2015; Grafeld *et al.* 2016; Ureta *et al.* 2016), seagrass (Dewsbury *et al.* 2016) and fish resources (Rizal and Dewanti 2017). Besides, WTP was also able to be given for existence value of tourism area (Faizan *et al.* 2016; Subanti *et al.* 2017; Anna and Saputra 2017).

This research aimed to find out how much the WTP of local people around Youtefa Bay (Tobati, Enggros and Nafri Villages) in order that the mangrove ecosystem existence in Youtefa Bay Nature Park Area was kept preserved and sustainable. In this research would analyze variables that impacted toward WTP.

1. Methodology

a. Study area

This research had been conducted in Youtefa Bay Nature Park area, Jayapura, Indonesia (Figure 1). Data collection was conducted from March to April 2018 located in the villages in Youtefa Bay Nature Park area, scilicet Tobati, Enggros and Nafri Villages, of Jayapura.

b. Data collection

Total respondents in this research were 228 respondents (46 respondents from Tobati Village, 82 respondents from Enggros Village and 100 respondents from Nafri Village) that consisted of 150 males and 78 females. Total households in this three villages were 514 households (100 households from Tobati Village, 130 households from Enggros Village, and 274 households from Nafri Village).

WTP value collection technique used Contingent Valuation Method (CVM). CVM method was frequently used to estimate non-use value or passive use value. CVM could also be instanced as an approach to measure the value of WTP (Fauzi, 2006). With the application of the CVM, respondents are directly requested to determine the amount of money they are WTP (Ligus, 2018). CVM method used hypothesis to measure the existence of goods and service which was not market valued (Carson and Hanemann, 2005). This technique was carried out with directly asking way to respondents how much they paid for a better condition. These research respondents were given a hypothetical market scenario about mangrove ecosystem existence in Youtefa Bay area. Here is the scenario created to help respondents in comprehending the questions about willingness to pay the existence value of mangrove ecosystem:

Mangrove ecosystem functions as dwellings for some animals like crabs, shrimps, clams, and breeding ground for some types of fish and other biotas. Mangrove existence also gives benefits for the local people around in fulfilling the firewood's and lumbers for houses. Moreover, mangrove also functions as coastal protection. The important point is that there has been change of mangrove width in Youtefa Bay area, that which in 1994 the width was 397.45 ha and in 2017 was 233.12 ha and mostly in damaged condition thus it costs a dead loss. The amount of fish caught/shrimp/crab fisheries decrease and can give consequence of coastal abrasion and seawater intrusion. If government wants to fix this damaged mangrove condition, would you like to participate by contributing giving a few household incomes per year for the refinement program so that the mangrove ecosystem is always maintained and preserved.

Next, respondents were showed figure about two different conditions of mangrove (fine and damaged). Then, to obtain offering value of respondent WTP value amount toward mangrove ecosystem, respondents were asked "YES" or "NO" question to give contribution upon the mangrove ecosystem existence. The offered WTP value toward this research was in unit price (Indonesia Rupiah, IDR). If respondents chose "YES", they would be given WTP offering value (IDR/year) namely IDR 10,000.00; IDR 20,000.00; IDR 30,000.00; IDR 50,000.00; IDR 75,000.00; IDR 100,000.00; IDR 125,000.00; IDR 150,000.00 and more than IDR 150,000.00.

c. Data analysis

In this research, WTP meant respondent's willingness to pay price per year for mangrove ecosystem existence value and local's willingness to contribute or willingness to pay for mangrove preservation and rehabilitation program in Youtefa Bay area. The stages of WTP analysis were as following:

- a) Measuring mean WTP conjecture by using equation as follows:

$$EV = \left[\sum_{i=0}^n EV_i \right] / n \quad (1)$$

where:

EV = existences value

EV_i = existences value form respondent to i

n = number of respondents.

- b) Aggregating individual mean WTP result into population WTP by multiplying mean WTP result with population amount (household amount).

- c) Estimating equation of multiple linear regressions and to find out contribution of each WTP variables at a time. All qualitative variables in this research (gender, education level, occupation, age and how many times

the respondents joined workshop/seminary/training) must has been converted to numerical value (Table 1). Generally, equation of multiple regression, the variables toward WTP value were as following:

$$WTP = \beta_0 + \beta_1SE + \beta_2AG + \beta_3ED + \beta_4IN + \beta_5OC + \beta_6PA + \epsilon_i \tag{2}$$

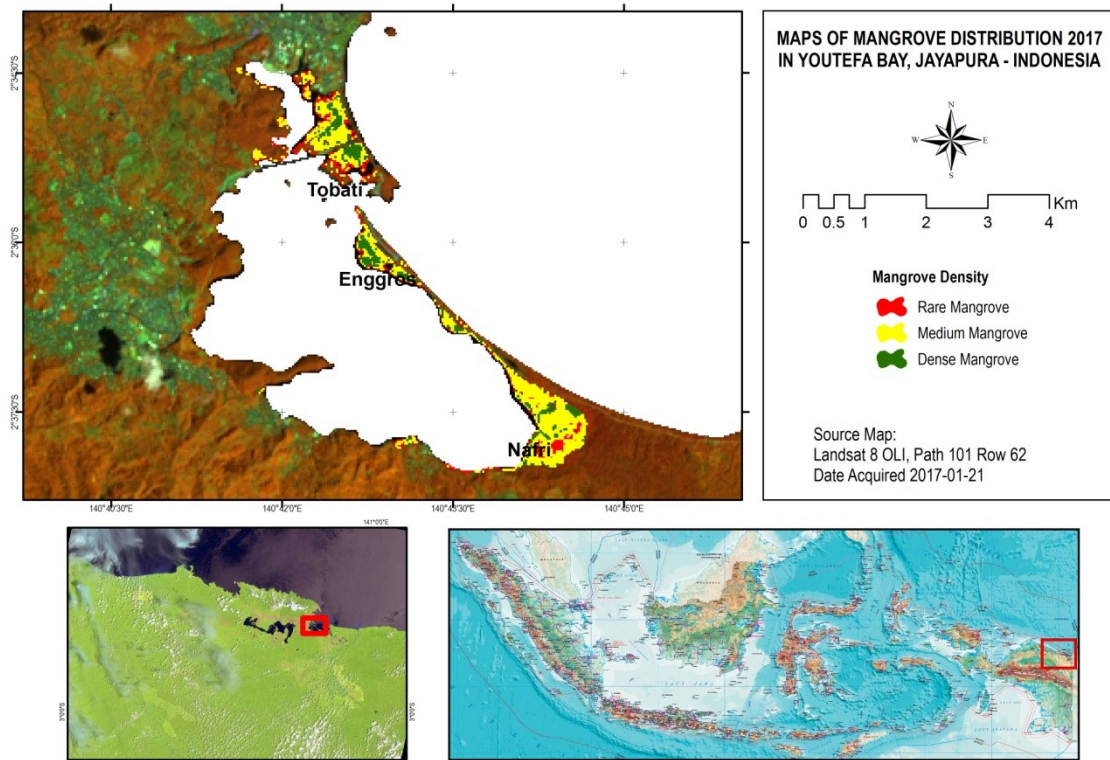
where:

- β_0 = Constant
- β_1, \dots, β_6 = Regression coefficient
- SE = Sex
- AG = Age
- ED = Education
- IN = Income
- OC = Occupation
- PA = Participant in workshop/seminary/training about mangrove ecosystem
- ϵ = Error
- i = Respondent to- i ($i = 1, 2, 3, \dots n$)

Table 1. Description of WTP variables

Variables	Description
Sex	0 = female, 1 = male
Age	Numeric; age respondent
Education	0 = never, 1 = primary school, 2 = secondary school, 3 = high school, 4 = diploma/bachelor degree
Income	Numeric; income respondent per month (IDR/month)
Occupation	1 = not related to mangroves (farmers, private employees, government employees), 2 = related to mangroves (fisherman, seashells and crabs)
Participant in workshop/seminary/training about mangrove ecosystem	0= never, 1 = participated

Figure 1. Map of the study area at Youtefa Bay, Jayapura, Indonesia



2. Results and Discussion

a. Respondents characteristics

The communities in three villages in Youtefa Bay, namely Tobati Village, Enggros Village and Nafri Village were basically communal title owner upon Youtefa Bay areal usage and resources, Jayapura. Most of people from these three villages were fisherman as their main livelihood and sidejob.

The conducted respondent characteristics in this research were gender, age, education level, earning per month, occupation and activity of joining seminary/training/workshop activity about mangrove ecosystem (Table 2). Most of the respondents were males whose dominant livelihoods were fisherman and mean income per month was IDR 1,618,860.00/month. Most of respondents' education levels were high school. In conservation field, several respondents were members of Youtefa Bay mangrove ecosystems management and about 58 respondents had ever joined training or seminary activities about mangrove ecosystem held by local government or by non-governmental organizations.

b. Willingness to pay for mangrove ecosystem existence

Basically, measuring WTP aimed to find out how high every individual's or people's ability in aggregate to pay or spend money in refining environment condition in order to make it in better condition as it was expected to or willingness of accepting compensation with the deterioration of environment quality in natural system as well as environment quality around it. WTP in this research was respondent's willingness to contribute or pay for refinement, rehabilitation and preservation program in order that the existence of mangrove ecosystem on Youtefa Bay Nature Park was preserved and maintained. From 228 respondents, there were 92.98% (212 respondents) who willed to contribute or pay for mangrove preservation and rehabilitation program. The rest 7/02% (16 respondents) didn't will to contribute or pay with various reasons, namely that mangrove preservation and rehabilitation program was government's responsibility and lack of economic earnings.

Table 2. Characteristics of respondents

Characteristics	Frequency	Percentage (%)
Sex	Male	65.79
	Female	34.21
Age	Less than 20 years old	1.75
	21-30 years old	17.54
	31-40 years old	21.05
	41-50 years old	23.68
	51-60 years old	21.05
	More than 60 years old	14.91
Education	Primary school	21.93
	Secondary school	18.42
	High school	47.37
	Diploma/bachelor	12.28
Income (IDR/month)	Less than IDR 1,000,000	26.32
	IDR 1,000,000- IDR 2,000,000	33.33
	IDR 2,000,001- IDR 3,000,000	33.33
	IDR 3,000,001- IDR 4,000,000	5.26
	More than IDR 4,000,000	1.75
Occupation	Fisherman	44.30
	Farmers	1.75
	Housewife (seashells and crabs)	28.95
	Private employees	8.77
	Government employees	16.23
Participant in workshop/seminary/ training about mangrove ecosystem	Never	74.56
	Participate	25.44

According to WTP offering result, respondent WTP value which was obtained was from IDR 0 to more than IDR 150,000.00 (Table 3). Respondent WTP which was more than IDR 150,000.00, dominantly wanted to pay IDR 200,000.00/year. From that respondent WTP, mean WTP was IDR 56,052.63. When the mean WTP

was multiplied by household amount in the three villages where the respondents were located - namely 514 households, the WTP was IDR 28,811,052.63.

This quite high WTP value in this research showed that Tobati, Enggros, and Nafri Villages people gave great appreciation toward mangrove ecosystem existence in Youtefa Bay because the local people had experienced the mangrove ecosystem benefits for their necessities and economy. Many direct benefits of mangrove ecosystem which had been experienced by the communities were many economic productions such as fish, crabs, shrimps, oyster, and firewood's. Furthermore, the communities also experienced indirect benefits of mangrove as coastal protection and residences for them. In addition, they were also willing to contribute or pay for mangrove preservation and rehabilitation program in Youtefa Bay.

Mean WTP value in this research was kind of quite high value if it had been compared to local people WTP for mangrove ecosystem existence in other area in Indonesia. Mean WTP for mangrove existence value in Pulokerto coastal area, Pasuruan, Indonesia, was approximately IDR 26,564.00 (Sina *et al.* 2017). Moreover, research result by Susilo *et al.* (2017), mean WTP value was IDR 35,413.00 for mangrove existence result in Delta Mahakam, Indonesia. Higher WTP value for mangrove ecosystem existence was given by local people in Merauke Regency, Indonesia was IDR 125,220.00 (Widiastuti *et al.* 2016) and IDR 489,855.00 in North Gorontalo Regency, Indonesia (Triyanti *et al.* 2017).

Table 3. Distribution of WTP value for mangrove ecosystem existence

WTP	Frequency	Percentage (%)
IDR 0	16	7.02
IDR 10,000.00	58	25.44
IDR 20,000.00	28	12.28
IDR 30,000.00	8	3.51
IDR 50,000.00	54	23.68
IDR 75,000.00	0	0
IDR 100,000.00	32	14.04
IDR 125,000.00	0	0
IDR 150,000.00	18	7.89
More than IDR 150,000.00	14	6.14

c. Variables that influenced willingness to pay

Analysis result of variables effect toward WTP value was presented at Table 4. Some variables significantly influenced to WTP value for appreciation toward mangrove ecosystem existence value. Income variable had influence significantly toward WTP value, in which the higher income respondent earned, the higher WTP was given for mangrove ecosystem existence value. The lower income would have caused respondents not contributing for mangrove ecosystem existence value (10 of 16 respondents who didn't will to contribute were respondents who's earning less that IDR 1,000,000.00/month). Same variables were also discussed in research result conducted by Wahyuni *et al.* (2014), in which income variable impacted significantly to respondent WTP value for mangrove ecosystem existence value in Delta Mahakam, East Kalimantan, Indonesia. Therefore, in any cases, someone's income level would impact toward the amount of WTP value (Subanti *et al.* 2017). Aside from income level variable, participation variable in workshop/seminary/training activities also affected significantly to respondent WTP value. The more frequently they participated in the seminary/training/workshop activities, the more higher awareness and comprehension about the important of mangrove ecosystem, thus the given WTP value would have been bigger too.

Table 4. Regression analysis result of WTP value for mangrove ecosystem existence

Variable	Coefficients	SE coefficients	P-value	Remarks*
(Constant)	11932.003	31630.430	0.706	-
Sex	6710.683	8989.529	0.456	Not significant
Age	504.886	302.047	0.096	Not significant
Occupation	-10124.422	9589.579	0.292	Not significant
Education	9128.376	4926.252	0.065	Not significant
Income	0.010	0.005	0.030*	Significant
Participant	25622.441	8535.784	0.003*	Significant
R square (R ²)				0.430
F value				7.743

*The real level (α) 95%

Gender, age, and education variables is valued positive, meant that the three variables also influenced the WTP value. This influence of three variables was not significant like income variables and participation in workshop/seminary/training activities about mangrove ecosystem. This case was showed by quite small mean WTP value difference between men and women, namely IDR 63,521.13 (men) and IDR 53,714.29 (women). Just like mean WTP value based on age variable, where the highest WTP was given by 31–40 age group. Education level variable was showed by the highest WTP to respondents in diploma or bachelor and secondary school education level. In regression analysis result, only occupation variable had negative value. Main occupation type that related directly to mangrove ecosystem, such as fisherman, seashell and crab fisherman did not guarantee that they would give higher WTP from main occupation type that didn't relate directly to mangrove ecosystem. The same result was also obtained by Wahyuni *et al.* (2014) in research that occupation variables as university student and entrepreneur were more influential toward WTP value which was given for mangrove ecosystem existence compared to fisherman.

Conclusion

WTP value which was given by local's people in Tobati, Enggros and Nafri Villages for mangrove ecosystem existence in Youtefa Bay Nature Park area was kind of quite high value. This showed that people of Tobati, Enggros and Nafri Villages gave a grand appreciation to mangrove ecosystem existence because people had experienced mangrove ecosystem benefits for economy and fulfilment of their necessities. Significantly influential variables toward WTP value was earning and participation and workshop/seminary/training about mangrove ecosystem. Meanwhile, gender, age, education level and occupation variables didn't give any impacts significantly to the given WTP value amount. The main occupation type that directly relation to mangrove ecosystem, like fisherman and seashell, crab fisherman did not guarantee that they would have given higher WTP than main occupation type that indirectly related to mangrove ecosystem.

The higher communities' appreciation toward mangrove ecosystem existence had to be together with people's high awareness in using mangrove ecosystem by caring its preservation. If mangrove ecosystem had continuously been under pressure due to the high usage level and there had been no rules or management, of course the mangrove ecosystem economy would have always decreased and needed substantial cost to overcome negative impact, including expense for the mangrove ecosystem rehabilitation activity.

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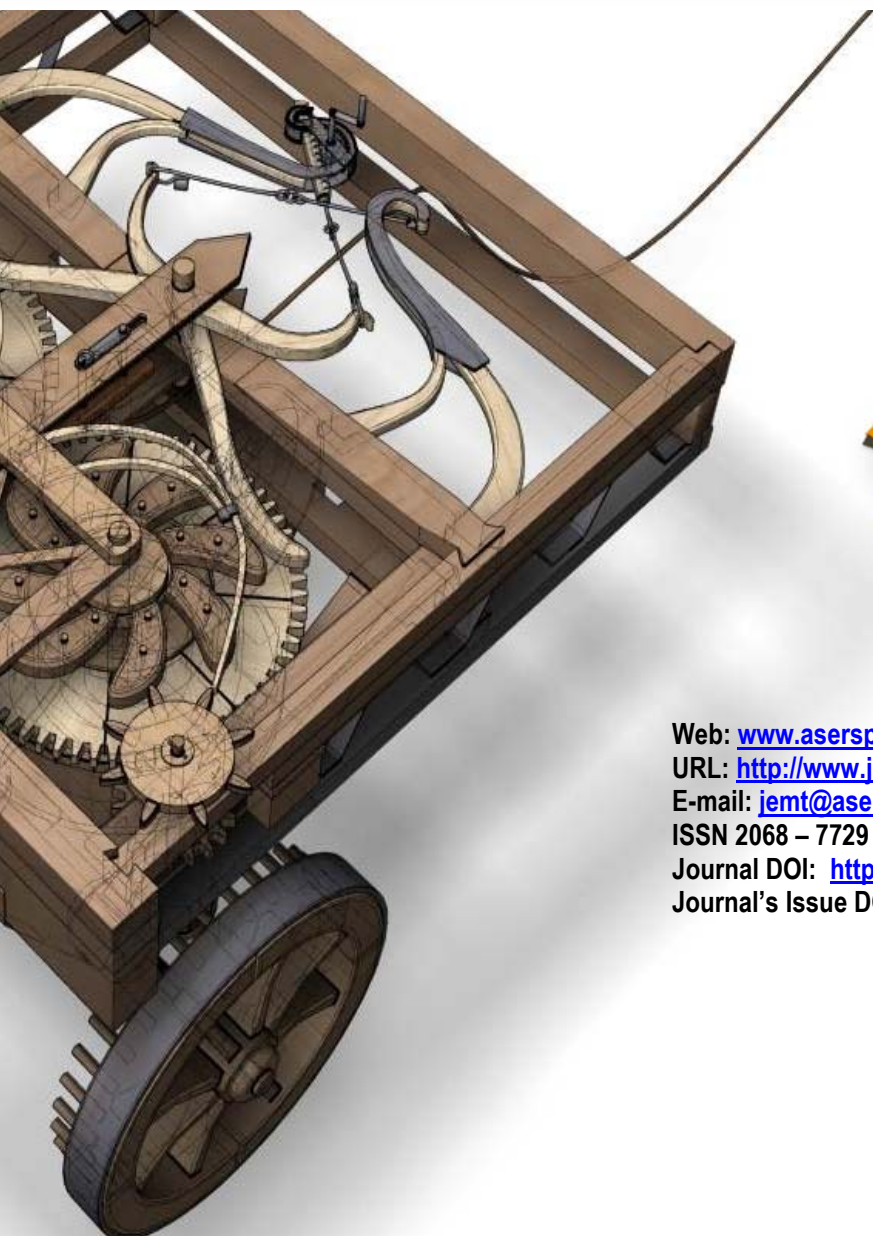
References

- [1] Alongi, D.M. and Mukhopadhyay, S.K. 2015. Contribution of mangroves to coastal carbon cycling in low latitude seas. *Agricultural and Forest Meteorology*, 213: 266-272. DOI: <https://doi.org/10.1016/j.agrformet.2014.10.005>
- [2] Anna, Z. and Saputra, D.S. 2017. Economic valuation of whale shark tourism in Cenderawasih Bay National Park, Papua, Indonesia. *Biodiversitas*, 18(3): 1026-1034. DOI: <https://doi.org/10.13057/boidiv/d180321>
- [3] Atkinson. S.C., Jupiter, S.D., Adams, V.M., Ingram, J.C., Narayan, S., Klein, C.J. and Possingham, H.P. 2016. Prioritising mangrove ecosystem services results in spatially variable management priorities. *Plos One*, 11(3): 1-21. DOI: <https://doi.org/10.1371/journal.pone.0151992>
- [4] Bakaki, Z. and Bernauer, T. 2016. Measuring and explaining the willingness to pay for forest conservation: evidence from a survey experiment in Brazil. *Environmental Research Letters*, 11: 1-8. DOI: <https://doi.org/10.1088/1748-9326/11/11/114001>
- [5] Barton, D.N. 1994. Economic Factors and Valuation of Tropical Coastal Resources. SMR-report 14/94. Universitetet I Bergen Senter for Miljø-OG Ressursstudier.
- [6] Benson, L., Glass, L., Jones, T.G., Ravaoarinorotsihoarana, L. and Rakotomahazo, C. 2017. Mangrove carbon stocks and ecosystem cover dynamics in southwest Madagascar and the implications for local management. *Forests*, 8: 190. <https://doi.org/10.3390/f8060190>
- [7] Carson, R.T. and Hanemann, M.W. 2005. *Contingent Valuation*. In Mler, K.G. and Vincent, J.R: Handbook of Environmental Economics. New York: Elsevier.

- [8] Chanchaoenchai, K. and Saraithong, W. 2017. Assessment of willingness to pay for good agricultural practice cabbage. *Journal of Environmental Management and Tourism*, 8(3): 629-641. DOI: [https://doi.org/10.14505/jemt.v8.3\(19\).14](https://doi.org/10.14505/jemt.v8.3(19).14)
- [9] Dewsbury, B.M., Bhat, M. and Fourqurean, J.W. 2016. A review seagrass economic value: Gaps and progress in valuation approaches. *Ecosystem Services*, 18: 68-77. DOI: <https://doi.org/10.1016/j.ecoser.2016.02.010>
- [10] Faizan, M., Sasekumar, A. and Chenayah, S. 2016. Estimation of local tourist willingness to pay. *Regional Studies in Marine Science*, 7: 142-149. DOI: <https://doi.org/10.1016/j.rsma.2016.06.005>
- [11] Fauzi, A. 2006. *Ekonomi Sumberdaya Alam dan Lingkungan: Teori dan Aplikasi*. Jakarta: PT Gramedia.
- [12] Friess, D.A., Richards, D. and Phang, V.X.H. 2016. Mangrove forests store high densities of carbon across the tropical urban landscape of Singapore. *Urban Ecosystems*, 19(2): 795-810. DOI: <https://doi.org/10.1007/s11252-015-0511-3>
- [13] Gajdzik, L., Vanreusel, A., Koedam, N., Reubens, J. and Muthumbi, A.G.N. 2014. The mangrove forests as nursery habitats for the ichthyofauna of Mida Creek (Kenya, East Africa). *Journal of the Marine Biological Association of the United Kingdom*, 94(5): 865–877. DOI: <https://doi.org/10.1017/S0025315414000290>
- [14] Getzner, M., Jungmeier, M. and Spika, M. 2017. Willingness-to-pay for improving marine biodiversity: A case study of Lastovo Archipelago Marine Park (Croatia). *Water*, 9(2): 1-18. DOI: <https://doi.org/10.3390/w9010002>
- [15] Grafeld, S., Oleson, K., Barnes, M., Peng, M., Chan, C. and Weijerman, M. 2016. Diver's willingness to pay for improved coral reef condition in Guam: An untapped source of funding management and conservation? *Ecological Economics*, 128: 202-213. DOI: <https://doi.org/10.1016/j.ecolecon.2016.05.005>
- [16] Halkos, G.E. and Galani, G.K. 2013. Economic foundation to assess non-market values in marine and coastal ecosystems water quality. *Journal of Environmental Management and Tourism*, 4(1): 5-20.
- [17] Hamuna, B., Sari, A.N. and Megawati, R. 2018. Kondisi hutan mangrove di kawasan Taman Wisata Alam Teluk Youtefa, Kota Jayapura. *Majalah Ilmiah Biologi Biosfera: A Scientific Journal*, 35(2): 75-83. DOI: <https://doi.org/10.20884/1.mib.2018.35.2.611>
- [18] Handono, N., Tanjung, R.H.R. and Zebua, L.I. 2014. Struktur vegetasi dan nilai ekonomi hutan mangrove Teluk Youtefa, Kota Jayapura, Papua. *Jurnal Biologi Papua*, 6(1): 1-11.
- [19] Hanley, N. and Spash, C.L. 1993. *Cost-Benefit analysis and the environment*. Edward Elgar Publishing Limited.
- [20] Hashim, A.M. and Shahrizzaman, D.B. 2017. Effectiveness of mangrove forest as coastal protection along the west coast of Northern Peninsular Malaysia. *MATEC Web of Conferences*, 87: 1-8. DOI: <https://doi.org/10.1051/mateconf/20178701014>
- [21] Hong, L.C., Hemati, Z.H. and Zakaria, R.M. 2017. Carbon stock evaluation of selected mangrove ecosystem in Peninsular Malaysia and its potential market value. *Journal of Environmental Science and Management*, 20(2): 77-87.
- [22] Jones, N., Clark, J.R.A. and Malesios, C. 2015. Social capital and willingness to pay for coastal defences in south-east England. *Ecological Economics*, 119: 74-82. DOI: <https://doi.org/10.1016/j.ecolecon.2015.07.023>
- [23] Ligus, M. 2018. Measuring the willingness to pay for improved air quality: A contingent valuation survey. *Polish Journal of Environmental Studies*, 27(2): 763-771. DOI: <https://doi.org/10.15244/pjoes/76406>
- [24] Malik, A., Fensholt, R. and Mertz, O. 2015. Economic valuation of mangroves for comparison with commercial aquaculture in South Sulawesi, Indonesia. *Forests*, 2015(6): 3028-3044. DOI: <https://doi.org/10.3390/f6093028>
- [25] Mojiol, A.R., Guntabid, J., Lintangah, W., Ismenyah, M., Kodoh, J., Chiang, L.K. and Sompud, J. 2016. Contribution of mangrove forest and socio-economic development of local communities in Kudat District, Sabah Malaysia. *International Journal of Agriculture, Forestry and Plantation*, 2: 122-129.

- [26] Palanca-Tan, R. 2015. Knowledge, attitudes, and willingness to pay for sewerage and sanitation services: A contingent valuation survey in Metro Manila, Philippines. *Journal of Environmental Science and Management*, 18(2): 44-52.
- [27] Paulangan, Y.P. 2014. Potensi ekosistem mangrove di Taman Wisata Teluk Youtefa Kota Jayapura Papua. *Jurnal Kelautan*, 6(1): 88-98.
- [28] Rizal, A. and Dewanti, L.P. 2017. Using economic value to evaluate management options for fish biodiversity in the Sikakap Strait, Indonesia. *Biodiversitas*, 18(2): 575-581.
- [29] Rizal, A., Sahidin, A. and Herawati, H. 2018. Economic value estimation of mangrove ecosystems in Indonesia. *Biodiversity International Journal*, 2(1), 98-100. DOI: <https://doi.org/10.15406/bij.2018.02.00051>
- [30] Salem, M.E. and Mercer, D.E. 2012. The economic value of mangroves: A meta-analysis. *Sustainability*, 2012(4): 359-383. DOI: <https://doi.org/10.3390/su4030359>
- [31] Saraithong, W. 2016. Estimating willingness to pay for safe beef. *Journal of Environmental Management and Tourism*, 7(1): 94-104. DOI: [https://doi.org/10.14505/jemt.v7.1\(13\).09](https://doi.org/10.14505/jemt.v7.1(13).09)
- [32] Sina, I., Maryunani, Batoro, J. and Harahab, N. 2017. Analysis of total economic value of ecosystem mangrove forest in the coastal zone Pulokerto Village District of Kraton Pasuruan Regency. *International Journal of Ecosystem*, 7(1): 1-10. DOI: <https://doi.org/10.5923/j.ije.20170701.01>
- [33] Subanti, S., Hakim, A.R., Irawan, B.R.M.B. and Hakim, I.M. 2017. Determinant of willingness to pay and economic value for tourism object using contingent valuation method: the case of Sangiren site, Province of Central Java, Indonesia. *Journal of Environmental Management and Tourism*, 8(4): 867-874. DOI: [https://doi.org/10.14505/jemt.v8.4\(20\).16](https://doi.org/10.14505/jemt.v8.4(20).16)
- [34] Suharti, S., Darusman, D., Nugroho, B. and Sundawati, L. 2016. Economic valuation as a basis for sustainable mangrove resource management a case in East Sinjai, South Sulawesi. *Jurnal Manajemen Hutan Tropika*, 22(1): 13-23. DOI: <https://doi.org/10.7226/jtfm.22.1.13>
- [35] Suprpto, D., Kirana, M., Susilowati, I. and Fauzi, A. 2015. Economic valuation of mangrove restoration in Indonesia. *Jurnal Ekonomi Pembangunan*, 16(2): 121-130. DOI: <https://doi.org/10.23917/jep.v16i2.1457>
- [36] Susilo, H., Takahashi, Y. and Yabe, M. 2017. Evidence for mangrove restoration in the Mahakam Delta, Indonesia, based on households' willingness to pay. *Journal of Agricultural Science*, 9(3): 30-41. DOI: <https://doi.org/10.5539/jas.v9n3p30>
- [37] Tong, C., Feagin, R.A., Lu, J., Zhang, X., Zhu, X., Wang, W. and Wenshan, W. 2007. Ecosystem service values and restoration in the Urban Sanyang Wetland of Wenzhou, China. *Ecological Engineering*, 29(3): 249-258. DOI: <https://doi.org/10.1016/j.ecoleng.2006.03.002>
- [38] Trang, P.T.T., Toan, D.Q. and Hanh, N.T.X. 2017. Estimating household willingness to pay for improved solid waste management: A case study of Thu Dau Mot City, Binh Duong. *MATEC Web of Conferences*, 95: 1-4. DOI: <https://doi.org/10.1051/mateconf/20179518004>
- [39] Triyanti, R., Firdaus, M. and Pramoda, R. 2017. Total nilai ekosistem mangrove di Kabupaten Gorontalo Utara, Provinsi Gorontalo. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 14(3): 219-236.
- [40] Tseng, W.W.C., Hsu, S.H. and Chen, C.C. 2015. Estimating the willingness to pay to protect coral reefs from potential damage caused by climate change: The evidence from Taiwan. *Marine Pollution Bulletin*, 101(2): 556-565. DOI: <https://doi.org/10.1016/j.marpolbul.2015.10.058>
- [41] Ureta, J.C.P., Lasco, R.D., Sajise, A.J.U. and Calderon, M.M. 2016. A ridge-to-reef ecosystem-based valuation approach to biodiversity conservation in Layawan Watershed, Misamis Occidental, Philippines. *Journal of Environmental Science and Management*, 19(2): 64-75.
- [42] Wahyuni, Y., Putri, E.I.K. and Simanjuntak, S. M. H. 2016. Valuasi total ekonomi hutan mangrove di kawasan Delta Mahakam Kabupaten Kutai Kartanegara Kalimantan Timur. *Jurnal Penelitian Kehutanan Wallacea*, 3(1): 1-12.
- [43] Widiastuti, M.M.D., Ruata, N.N. and Arifin, T. 2016. Valuasi ekonomi ekosistem mangrove di wilayah pesisir Kabupaten Merauke. *J. Sosek KP*, 11 (2): 147-159.

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