Mahadi : Indonesia Journal of Law
Journal homepage: https://talenta.usu.ac.id/Mahadi

Carbon Trading Literacy in Coastal Communities of Gampong Sungai Lueng-Langsa

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ARTICLE INFO
Article history:
Received 24 July 2024
Revised 23 August 2024
Accepted 30 August 2024
Available online
https://talenta.usu.ac.id/Mahadi

E-ISSN: 2964-7185
P-ISSN: 3025-3365

How to cite:
Siregar, M., dkk. Tarigan, V.C.E., Mulyadi, M., Lubis, Y.M., Asnawi, M.I. (2024). Carbon Trading Literacy in Coastal Communities of Gampong Sungai Lueng-Langsa. Mahadi: Indonesia Journal of Law, 3(02), 137-145.

http://doi.org/10.26594/register.v6i1.idarticle

ABSTRACT
Carbon trading is an activity of buying and selling carbon credits, where the buyer produces carbon emissions that exceed the specified limits. This is regulated in Presidential Regulation (Perpres) Number 98 of 2021 concerning the Implementation of the Economic Value of Carbon to Achieve Nationally Determined Contribution Targets. and Controlling Greenhouse Gas Emissions in National Development. Carbon trading is currently a priority program in the government to reduce greenhouse effect emissions, air conditioning, air pollution and factory waste which result in uncontrolled climate change. Through carbon trading literacy, the public can understand the importance of preserving mangroves in Gampong Sungai Lueng. The use of mangroves is very necessary to control carbon and community economic growth, so from the results of this research the community needs knowledge about carbon trading which is currently included in the government's priority program amidst carbon trading which is currently still an issue that must continue to be socialized to the community. Efforts to preserve mangroves as a marine resource for sustainable development in order to create conditions that are free of emissions from the impact of greenhouses, air conditioning, pollution and waste from factories that pollute the environment which has an impact on society, this is also the case at all times for the environment in all regions in Indonesia.
Keyword: Literacy, Carbon Trading, Coastal Communities

ABSTRAK
Carbon trading merupakan kegiatan jual beli kredit karbon (*carbon credit*), di mana pembeli menghasilkan emisi karbon yang melebihi batas yang ditetapkan hal ini diatur dalam Peraturan Presiden (Perpres) Nomor 98 Tahun 2021 tentang Penyelenggaraan Nilai Ekonomi Karbon untuk Pencapaian Target Kontribusi yang Ditetapkan Secara Nasional dan Pengendalian Emisi Gas Rumah Kaca dalam Pembangunan Nasiona. Carbon trading saat ini menjadi program prioritas dalam pemerintah untuk mengurangi emisi efek rumah kaca, AC, pulusi udara dan limbah pabrik yang berakibatkan perubahan iklim yang tidak terkendali, melalui literasi carbon trading masyarakat dapat mengetahui pentingnya pelestarian mangrove di Gampong Sungai Lueng. Pemanfaatan mangrove sangat diperlukan sebagai pengendalian carbon dan pertumbuhan ekonomi Masyarakat maka dari hasil penelitian ini masyarakat perlu adanya pengetahuan mengenai carbon trading yang saat ini masuk dalam program prioritas pemerintahan ditengah-tengah perdagangan karbon yang saat ini masih menjadi sebagai isu yang terus harus disosialisasikan kepada masyarakat. Upaya pelestarian mangrove sebagai sumberdaya kelautan untuk pembangunan yang berkelanjutan demi terciptanya kondisi yang bebas emisi dari dampak rumah kaca, AC, polusi, dan limbah dari pabrik yang mencemarkan lingkungan yang berdampak pada Masyarakat, hal ini pula yang setiap saat menjadi kasus lingkungan di seluruh wilayah di Indonesia..
Keyword: Literasi, Carbon Trading, Masyarakat Pesisir

1. Introduction

Climate change that is currently occurring is a growing global concern, this is due to the increasing amount of carbon dioxide caused by various activities carried out by humans both on a small scale and on a large scale. Small scale can be grouped as an activity carried out by humans individually such as using air conditioning in private homes, using transportation equipment and so on, while in a large scale the majority of the causes occur because it is done together such as air pollution carried out by factories which in this case emit carbon dioxide in very large quantities which affects the stability of the environment which is mostly produced by production countries such as China, This has an impact not only on the country but the carbon dioxide released by the company causes a negative impact on other countries even though it is not a carbon dioxide producing country such as Indonesia, Malaysia, and many countries on the coast that are victims of global warming.

Furthermore, the United Nations United Nations saw the issue of global warming and made a meeting called the Intergovernmental Panel on Climate Change (IPCC) in 1988, in this IPCC there are various climatologists to see climate change that occurred in recent years, in this case the IPCC concluded that most of the increase in climate yeang occurs due to the increasing amount of greenhouse gases due to activities carried out by humans.[1]

Carbon trading is a hot issue these days. Carbon trading should be well regulated by the government for the sake of the nation. Carbon trading has become one of the world's favorites in the financial and environmental sectors since the Paris Agreement declaration in 2015. Where the reduction of greenhouse gases (GHG) is an agreement with the nations on this earth to maintain the survival of all of us.

The government regulates the Economic Value of Carbon (NEK) or Carbon Pricing with an official policy. The government's policy in regulating NEK will support the efforts to tackle climate change that are being carried out by Indonesia and the world community. For this reason, carbon governance must be properly regulated by the government for the benefit of this nation. Public understanding of carbon trading is very limited because it is not easily understood by the layman.

Carbon trading can simply be interpreted as the buying and selling of carbon credit certificates, where the commodity is not the carbon or pollutant gas but the effort to control or reduce carbon emissions (expressed in carbon credit certificates). This public misunderstanding must be addressed immediately through a good carbon literacy program from the government, so that the issue of carbon trading issues can be understood by the public and properly regulated by the government for the prosperity of the Indonesian nation.

The utilization of Economic Value of Carbon (NEK) is related to natural resources whose trade should be constitutionally regulated by the government for the sake of the nation, not regulated haphazardly by private parties who only see their business interests and form new oligarchies. Many of Indonesia's natural resources have not been optimally enjoyed by the nation, such as timber, minerals, oil and gas. For this reason, NEK affairs must really be handled with good governance for the prosperity of the Indonesian people.

Indonesia has committed to reduce greenhouse gas (GHG) emissions by 26% by 2020 and 29% by 2030, which was later increased after Indonesia's ratification of the Paris Agreement in 2015 to 29% by 2030 and 41% with the support of international cooperation, including the REDD+ (Reduction Emission Deforestation and Degradation) scheme. This commitment has been recorded as Indonesia's National Determination Contribution (NDC) to the world.

To maintain the benefits of NDC for the public interest, it has been regulated through Presidential Regulation (Perpres) Number 98 of 2021 concerning the Implementation of Carbon Economic Value for Achieving Nationally Determined contribution Targets and Controlling Greenhouse Gas Emissions in National development. This Presidential Regulation is the main legislation used to ensure that the NEK can take place with good governance in order to protect the Indonesian people from the attacks of world-class carbon “brokers” who are massively lobbying the government to liberalize carbon trading.

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[1]Riza Cadizza, Rizanizarli, Mainita, Carbon Trading Arrangements and Benefits for Indonesia, Unmuha Law Journal, Vol 1. No. 1, 2024, th. See also Gatut Susanta and Hari Sutjahjo, Will Indonesia Sink Due to Global Warming? Jakarta, Penebar Plus, 2007. p. 13

Presidential Regulation No. 98 of 2021 is an implementing regulation of Law No. 16 of 2016 on the Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change. In Presidential Regulation Number 98 of 2021, it has been regulated about the Carbon Economic Value and also the operational workings which are then derived from Permen LHK Number 21 of 2022.

Then there is also the Ministerial Regulation (Permen) of Environment and Forestry Number 21 of 2022 concerning Procedures for Implementing Carbon Economic Value. This regulation regulates general provisions, procedures for implementing carbon trading, performance-based payments, levies on carbon, other NEK implementation mechanisms, measurement, reporting and verification of NEK implementation, implementation of the National Register System (RN), certification of greenhouse gas emission reductions, management of funds for carbon trading, participation of parties, monitoring and evaluation and closing provisions.

Then it is also regulated in the Minister of Environment and Forestry Regulation Number 7 of 2023 concerning Forestry Sector Carbon Trading Procedures. This Ministerial Regulation regulates general provisions, implementation of emission trading and GHG emission offsets in the forestry sector, non-tax state revenue from carbon trading, reports, evaluation and guidance and closing provisions. So if private business entities and carbon trading rent-seekers say that the regulation on the Voluntary Carbon Market (VCM) is hampering voluntary carbon trading (VCM) internationally, they are wrong.

Through the United Nations Framework Convention on Climate change, hereinafter referred to as the UNFCC, which is a convention established between countries whose scope is to conduct international agreements aimed at maintaining the concentration of GHG greenhouse gases at a level that does not endanger human interaction with the climate.[2] With the GHG targets issued by the UNFCC, it is hoped that a target can be achieved within a certain period of time that allows ecosystems to adapt so as to ensure food availability and support sustainable economic development.[3]

One important element that needs to be prepared in the carbon market is a clear transaction mechanism, so that carbon payments through the carbon market can be implemented effectively, efficiently and fairly. With a clear transaction mechanism, carbon business certainty will increase, resulting in higher carbon trading volume and benefit value. For this reason, the government has issued regulations and established climate change mitigation institutions at the national and regional levels. Regarding forest carbon trading through the Clean Development Mechanism scheme involving afforestation and reforestation activities in Indonesia, which is currently not running well due to complicated procedures and requirements that must be met.[4]

In connection with the above, to support government programs through this research, Langsa City is one of the areas that has a mangrove ecosystem. The results of research using Landsat 8 OLI imagery of Langsa City mangrove area in 2016 amounted to 1668.80 ha and in 2018 amounted to 1338.03 ha. Mangrove distribution in Langsa City has decreased in a period of 2 years by 330.07 ha. The distribution of mangroves in the administrative area of gampong (urban village) is divided into eleven gampong (urban village) with gampong (urban village) which has the most extensive mangrove distribution, namely Gampong Sungai Lueng with a distribution of 3180.75 ha (67.30%) of the total mangrove distribution of Langsa City, while the smallest mangrove distribution is Gampong Baroh with a distribution of 0.63 ha (0.013%) of the total mangrove distribution of Langsa City.[5]

The National Research and Innovation Agency (BRIN) states that mangrove plants are able to absorb carbon emissions five times more than trees in the forest, the optimal function of carbon absorption by mangroves reaches up to 77.9%, where the absorbed carbon is stored in mangrove biomass in several parts such as stems, leaves, and sediments.[6] So to find alternatives, mangrove plants become a commodity in

[2] UNFCC, Profil UNFCC, diakses dari https://unfccc.int. tanggal 18 Juli 2024

[3] Ibid

[4] Deden Djaenudin, Mega Lugina, Ramawati Ramawati, Galih Kartikasari, Indartik Indartik, Mirna Aulia Pribadi, Satria Astana, The Forest Carbon Market Implementation Progress in Indonesia, Journal of Forestry Policy Analysis, Vol. 13 No. 3, 2016, p. 160

[5] M Taufik Rahmadi, Eni Yuniastuti, Maulana Abdul Hakim, Ayu Suciani, Mangrove Distribution Mapping Using Sentinel-2A Imagery: Case Study of Langsa City, Jambura Geoscience Review, Vol. 4 No. 1, January 2022, p. 7

[6] https://www.antaranews.com/berita/3814536/brin-sebut-tanaman-mangrove-mampu-menyerap-emisi-karbon, dated July 18,

carbon trading literacy in the community as a reduction in carbon emissions in the utilization of mangrove forests in Gampong Sungai Lueng Kota Langsa.

2. Method

The writing in this research uses normative juridical research methods through a statutory approach. This research was conducted using literature study, through objective elaboration of primary legal materials in the form of statutory regulations, and reviewing secondary materials from journals, books and literature that are relevant to the research topic in an effort to produce a research synthesis that is credible and academically accountable. comprehensive, systematic and integrated.[7] The analysis was carried out by describing the use of mangrove forests which have carbon trading activities. Therefore, in efforts to manage mangrove forests, aspects of knowledge, perception of mangrove forests, as well as the level of citizen participation in mangrove forest management, must be investigated under the basic guidance of mangrove forest management.

3. Result and Discussion

3.1 Mangrove Utilization as Carbon Control and Community Economic Growth

Mangrove forests, on an ecological scale, are very important ecosystems, especially because of their carrying capacity for the stability of coastal ecosystems. The stability of the mangrove ecosystem will have a very broad influence on the sustainability of coastal areas. Mangroves as forest ecosystems, have very distinctive properties and characteristics, growing on muddy beaches and river estuaries. On the other hand, this ecosystem is experiencing various very heavy pressures due to the expansion of various other utilization desires. Often the idea of utilization is based on a narrow economic evaluation, which only focuses on one use of mangroves. When examined broadly, mangrove ecosystems have very complex functions and roles, which include ecological, social, and economic functions.

Mangrove plants have a special ability to control Carbon Dioxide emissions, which is currently carbon trading. Adaptations of mangrove plants have developed mechanisms that allow them to actively remove salts from their tissues, and others have developed breathable root systems to aid oxygen uptake for their root systems. These distinctive root forms can often also distinguish mangrove vegetation types. Rooting forms can be categorized into aerial roots, tuberous roots, knee roots, breath roots, and support roots. These root forms are not only very effective in maintaining mud and beach stability, absorbing pollutants, but also in resisting seawater intrusion into the land. Another adaptability is that some mangrove species develop with fruits that germinate on the parent tree (viviparous), such as Kandelia, Bruguiera, Ceriops and Rhizophora.

In terms of structure, mangroves in Indonesia are more varied than those in other regions. Mangroves in Indonesia can be found ranging from stands of Avicennia marina with a height of 1-2 meters on sea-flooded beaches, to mixed stands of Bruguiera-Rhizophora-Ceriops with a height of more than 30 meters (for example, in Aceh). In open coastal areas, Sonneratia alba and Avicennia alba can be found, while along rivers that have lower salinity levels, Nypa fruticans and Sonneratia caseolaris are found. There are 202 species of mangrove plants, including 89 species of trees, 5 species of palms, 19 species of climbers, and several types of shrubs that can live and develop in Indonesia. Based on human intervention, mangrove forests can be divided into two categories, namely mangrove forests that grow naturally, and mangrove forests that are planted, either in connection with reforestation or reforestation activities. Along with the mastery of good mangrove planting techniques, the growth rate of mangrove planting has reached an average of 90%.[8]

Based on their status, Indonesia's mangrove forests are divided into production forests, national parks, wildlife reserves, nature reserves, and protected forests. Its management is the responsibility and

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[7] Asnawi. M.I., et al, Regulatory Arrangement in Supporting the Restructuring of State-Owned Plantation Enterprises, Journal Penelitian Hukum De Jure, Vol. 24. No. 2, July 2024, p. 109

[8] Emi Karminarsih, Utilization of Mangrove Ecosystems for Minimizing Disaster Impacts in Coastal Areas, Journal of Tropical Forest Management, Vol. XIII No. 3, December 2007, p. 182-187

authority of the Ministry of Forestry. While the non-area, where mangroves are located or planted by the community on community-owned lands and known as community forests, the authority and responsibility are in the hands of local governments. In the context of mangrove management, all parties are expected to continue to pay attention to applicable laws and regulations, both in the fields of forestry, fisheries, and the environment.[9]

People who understand the utilization of mangrove plants, they can feel there is a connection with the results of the fish they get, or other benefits. For example, the Sungai Lueng community in the city of Langsa-Aceh, has successfully planted and maintained mangroves, after proving that there is a link between mangrove sustainability and their fish catch. The Sungai Lueng Gampong/village community began to plant mangroves after their land was eroded by waves, because they believed that mangroves could withstand the onslaught of sea waves. Moreover, the Indonesian government is currently promoting the reduction of carbon emissions from various sources such as greenhouse gases, palm oil factory waste pollution and so on.

Many people are increasingly aware of the importance of mangrove forests as protectors of coastal areas from various threats of natural disasters, including carbon emissions and further utilization of mangroves as a community economy generated by Carbon trading. In this regard, government and community programs to rehabilitate coastal areas with mangrove forests, including in the area in Gampong / Sungai Lueng village have been increasingly clear and real, this carbon trading problem depends on community cooperation with the government both through BUMN and BUMS on funding programs from Carbon trading.

The function of mangrove forests Ecosystems Coastal areas will be more stable if they are increasingly covered by mangrove forests. Environmental problems arise in coastal areas where mangroves have been destroyed by humans. Damage to these coastal areas is exacerbated by the destruction of mangrove forests, or by other activities that can ecologically cause landslides. The losses caused are very complex, covering economic, social and ecological aspects. Ecologically, coastal areas have a very wide range of boundaries, which is not only the land area, but also includes the sea area. Thus, coastal areas can include seagrass ecosystems to coral reef ecosystems. As an ecological unit, its various components have a very strong reciprocal relationship. This means that the destruction of mangrove forests will not only reduce carbon emissions, but will also have a broad impact on terrestrial and marine ecosystems.

Given the strategic role of mangrove forests to protect and preserve the ecosystem components of coastal and marine areas, mangrove forests are absolutely necessary. Thus, mangrove protection and preservation programs need to get high attention and priority, especially for river estuaries in Gampong / Sungai lueng Village, Langsa City-Aceh.

Ecologically, the function of mangrove forests in protecting and preserving coastal areas are:

1. protecting the coastline and life behind it from the onslaught of tsunamis and winds, because of its relatively dense canopy conditions, and its strong and dense rooting conditions are able to grip and stabilize the soil of its growing habitat, and at the same time prevent salinization in the areas behind it;
2. protecting seagrass meadows and coral reefs, because their root systems are able to retain river silt and absorb various pollutants, which ecologically will ultimately be able to protect the lives of various types of flora and fauna associated with seagrass meadows and coral reefs;
3. protect the spawning grounds of various commercial fish and shrimp species, including the permanent and temporary homes of various birds, mammals, fish, crabs, shrimps, and reptiles, many of which are protected by law.

Socially, mangrove forests can also preserve social relationships with local communities. Because many of them need mangroves as a place to find fish, crabs, shrimp, as well as get wood and ingredients for medicines. Economically, mangrove forests will protect the value of the maritime economy.[10] Because of its ability to serve as a spawning ground for a variety of commercial fish and shrimp, or as a habitat for mangrove crabs, which in essence is not far from the government's carbon trading program to protect humans

[9] Ibid

[10] Alikodra, H. S. Mangrove Ecosystems as Natural Protectors of Coastal Areas. Paper presented at the Workshop on Coastal Ecosystem Rescue in Sand Mining Areas, Ministry of Marine Affairs and Fisheries. Batam. November 12, 2003.

who are increasingly troubled by erratic climate change.

There are three main stages in mangrove management.[11] First, ecological issues include the impact of human intervention on the ecology of mangrove ecosystems. Second, socio-economic issues that identify the habits of surrounding communities in utilizing mangrove ecosystems. Third, legal aspects that include regulations and laws regarding mangrove management. Community empowerment in economic rules is a process of opportunity for actors or human rights to obtain surplus value in their production activities. Efforts to obtain surplus value are carried out through the distribution of the use of production factors. This effort is done through appropriate political policies according to the socio-cultural conditions of the community.[12]

Haryanto, further stated that in efforts to conserve mangrove ecosystems, the main obstacles often faced are awareness raising and community empowerment. Awareness raising aims to convince coastal communities of the long-term benefits of mangrove area management.[13] The cause of failure in the community empowerment process is the use of a top-down centralized management approach which means that the community has little authority over the ecosystem. The community's sense of ownership of mangrove ecosystem resources also becomes very small. An important strategy in the process of planning and managing mangrove ecosystems is to involve the community through community-based management, which then follows the procedures of employment through certificates and creating groups registered with legal entities.

3.2 Mangrove Conservation Efforts as Marine and Ocean Resources for Sustainable Development

The concept of ecotourism has evolved over time. But in essence, the concept of ecotourism is responsible for the preservation of areas that are still classified as natural (ordinary areas), providing economic benefits and local communities.[14] Based on this understanding, the form of ecotourism is essentially a form of conservation movement that can be carried out by the world's population.[15] The definition of ecotourism was first introduced by the Ecotourism Association as follows: Ecotourism is a form of travel to natural areas that aims to protect the environment and protect the lives and well-being of the people around us. In the beginning, ecotourism was only practiced by nature-loving travelers who wanted their tourist destinations to remain intact and sustainable, in addition to the culture[16]. Due to the presence of protected mangrove forest parks, which function as carbon sinks, inorganic carbon (CO2) is converted during photosynthesis into organic carbon in the form of plant material. In most ecosystems, this material is biodegradable and releases carbon back into the atmosphere as (CO2). But in reality, mangroves contain a large proportion of non-degradable organic matter. As a result, mangroves function more as a carbon sink than a source. Mangrove plants that have many leaves can absorb more carbon than other plants.

The existence of mangrove forest ecotourism is about to share positive and negative effects on residents who are near the mangrove forest.[17] There is a change in mindset, where the activities and circumstances of residents who generally have a busy schedule with their respective activities both at home and outside the home, but since the existence of mangrove forest ecotourism development makes residents able to use opportunities and look for better opportunities to meet their daily needs.[18]

Efforts to preserve and develop mangrove forests continue to be tried by the government, this matter

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[11] D.Syukur, M. I. Aipassa, and M. Arifin. Policy Analysis of Community Involvement in Supporting Mangrove Forest Management. Jurnal Sosial Politika Vol. 14 No. 2, 2007.

[12] M. Mappatoba, Synergy of Empowering Marginalized Communities in Disadvantaged Villages in the Regency / City of Central Sulawesi Province. Media Litbang Central Sulawesi Vol. 2 No. 1, 2009, p. 34 -43

[13] Haryanto, R. 2008, *Op.cit.*

[14] R.Asy'ari, R. D. Dienaputra, A. Nugraha, R. Tahir, C. U. Rakhman, &R. R. Putra, Study of the Concept of Community-Based Ecotourism in Supporting Tourism Development: A Literature Study. Cultural Tourism: Scientific Journal of Religion and Culture, Vol. 6 No. 1, 2021, p. 9-19.

[15]E. Mulyadi, O. Hendriyanto, & N. Fitriani, Mangrove forest conservation as ecotourism. Scientific Journal of Environmental Engineering, Vol. 2 No. 1, 2010. p. 11-18

[16] M. R. Muâ,, & K. Indahsari. Ecotourism Development in Indonesia. SENRIABDI, Vol. 1 No. 1, 2021, 295-308.

[17]H. Purnobasuki. Utilization of mangrove forests as carbon storage. P*SL* Bulletin, University of Surabaya, Vol. 28 No. 3, 2012, p. 1-6

[18]S. F. Hamzah, H. Hamdani, & S. Astuty. (2022). Macrozoobenthos Community Structure in Pandansari Mangrove Forest Ecotourism Area, Brebes, Central Java. National Marine Journal, Vol. 17 No. 1, p. 1-12.

is tested by the accumulation of planting new magrove seeds. [19]The development of tourist attractions in the form of suggestions as well as infrastructure and infrastructure that supports mangrove forest tourism also continues to be tried by the government in collaboration with local residents, appeals for forest conservation, and can be used as a basis for an important plant for now for the continued sustainability of climate change due to greenhouse emissions, air pollution, factory waste and so on.

The development of mangrove conservation can be used as a marine resource in the utilization of its ecosystem, so in terms of carbon conservation, the community at least gets CSR funds from the government as a form of supporting the program from the global which is currently included in the carbon stock exchange. This can also be used as tourism development in the context of prolonged development as stated by Wijayanti, Novianti, and Hastuti, shown in the travel industry that can be controlled, one of which is ecotourism.[20] Tourism shares opportunities for tourists to enjoy the beauty of nature and local culture and explore the meaning of the various living things contained therein.[21] Tourism activities can also increase income for nature conservation and create economic benefits for the lives of nearby residents. [22]

The economic aspect is generally related to the family's expertise in earning income.[23] Income is the center of life, especially households to meet the most basic needs of life, especially food needs. Income is divided into: income from mangrove utilization (fish, shellfish and crabs), and income from mangrove utilization (workers, farmers or traders). Mangrove utilization that has been tried by the community is only in the form of marine biota, residents do not know the utilization of other mangroves, namely mangrove fruit that can be processed into various types of snacks such as; Blunt, syrup, crackers and chips that can be marketed to get income for residents. [24]

Community governance can be defined as a natural resource management system in which local communities actively participate in the process of managing the natural resources it contains.[25] And that the overall impact of ecological recovery including those who strongly agree with the impact of mangrove forest rehabilitation is as many as 40 respondents or 65.00% and this is because the social impact of the Sungai Lueng community strongly agrees and has a desire to be fully involved by parties related to the recovery of mangrove forests, but the community needs special assistance so that the activities carried out remain directed and remain in accordance with existing regulations in efforts to restore the ecology of mangrove forests. The ecological impact of the community can help restore the function of mangrove forests as a habitat for marine animals and can preserve the surrounding nature and in addition to the surrounding environment is well maintained economic activities carried out by the community due to the preservation of the mangrove forest environment can increase income economic impact on the ecological recovery of mangrove forests that can revive the wealth of flora and fauna that can be a source of income for people around the surrounding area.[26]

With the existence of mangrove forests, it benefits some people, namely being able to provide jobs for the surrounding community and with the existence of mangrove forests, their sustainability and ecosystems are starting to be maintained. The number of tourists present makes the trade of the surrounding community begin to increase, and with the use of tourist attractions there is a mangrove planting program

[19]F. Rumbino, S. Moeljono, & A. Ungirwalu. Local Community Perceptions of Mangrove Forest Development as an Ecotourism Area in Kampung Ruar, East Biak District, Biak Numfor Regency. Cassowary, Vol. 4 No. 2, 2021, p. 205-220

[20]P. Wijayanti, T. Novianti, &H. Hastuti. Economic analysis and ecotourism management strategy (case study of Mount Salak Endah tourist area in Bogor district). Indonesian Journal of Agricultural Sciences, Vol. 13 No. 3, 2008, p. 173-181

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[25] Irza Khurun‟in, and Genta Mahardhika Rozalinna. Community and Water Resources Governance: Participation and Contestation in Water Resources Management in Gunung Kawi, Malang Regency, INTERAKTIF: Jurnal Ilmu-ilmu Sosial, Vol. 13, 2021, p. 67

[26]N. Puspitasari, E. Lestari, & E. Widiyanti. Attitudes of Communities Around the Marunda Area Towards Ecological Restoration of Mangrove Forests in Marunda Village, Cilincing District, North Jakarta. AGRITEXTS: Journal of Agricultural Extension,Vol. 41 No. 2, 2017. p. 111

that is expected to increase the population of mangrove plants in the area.[27] According to the information of the people around the mangrove forest protected park tourist attractions, the government must play a role in its preservation, even not infrequently this mangrove area is visited by ministers, as a monitor in global development between the government and other countries in reducing emissions from greenhouse impacts, use of air conditioners, pollution, and factory waste that affects the community and even all citizens of the world.

4. Conclusion

Carbon as a universal indicator in measuring the performance of efforts to control climate change which is reflected in contributions determined nationally, apart from having important economic value and having an international dimension, which is mainly in the form of economic benefits for society, is also a reflection of the principles of sustainable resource management. The use of mangroves is very necessary to control carbon and economic growth for the community, so knowledge about carbon trading must continue to be disseminated to the community, which is currently included in the government's priority program in the midst of carbon trading, which is currently still an issue that must continue to be socialized to the community. Efforts to preserve mangroves as a marine resource for sustainable development in order to achieve conditions that are free of emissions from the impact of greenhouses, air conditioning, pollution and waste from factories that pollute the environment which has an impact on society, this is also the case at all times for the environment throughout the region. in Indonesia. The impacts and consequences of climate change affect the quality of people's lives so that it is necessary to take steps to protect the community as intended in Article 28 H paragraph (1) of the 1945 Constitution of the Republic of Indonesia and Article 65 paragraph (1) of Law Number 32 of 2OO9 concerning Environmental Protection and Management.

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