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Sustainable Environmental Management Based On Local Wisdom Of The Mbojo Bima Tribe, NTB

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ABSTRACT

The issue of environmental damage is currently increasingly worrying, starting from landslides, floods, piles of rubbish, agricultural activities, illegal logging, waste disposal, pollution, air, erosion, gas and water supplies which continue to be a real threat to human life. Meanwhile, the environmental damage index in Bima is at the highest position compared to other regions. This condition can be seen from the problems of forest destruction, pollution, waste disposal, and declining soil quality, causing floods and landslides in various sub-districts in the Bima NTB region, such as the Bima flash flood in 2016, floods in 9 (nine) Bima Regency sub-districts 2018-2023.Research purposes, want to know, the forms of environmental damage in Bima NTB, Also Want to know about sustainable environmental management based on local wisdom of the Mbojo Bima tribe, NTB.Research methodsin the form of empirical legal research with a sociological approach, case approach, conceptual approach and philosophical approach. Data sources include primary data and secondary data. Heuristic and interpretative analysis.Findings shows that (1) Forms of Environmental Damage in Bima, covers illegal logging, agricultural activities, use of herbicides and pesticides, irregular disposal of B3 waste, piles of rubbish everywhere, use of greenhouses, gas and dust pollution in various sub-districts. (2) Sustainable Environmental Management Based on the Local Wisdom of the Mbojo Bima Tribe, there is a balance between the values of the local wisdom of the Bima people and nature and the surrounding environment, where cultural beliefs about "parafu (sacred places that reside in springs and trees) and the concept of "ngaha aina ngoho" (managing forests and the environment well and sustainably) is the main basis for environmental management in the Bima NTB region.

Keywords: *Management, Environment, Local Wisdom*

INTRODUCTION

Environmental damage has become a global issue that has attracted the attention of many countries, where most countries in the world are threatened by an environmental crisis which will at any time damage the ecosystem and network of the universe, (Quinton & Fiener, 2024). Indonesia is also part of the threat of a crisis of damage, pollution, even geometrically the human population continues to increase, while pollution, air, floods, landslides, earthquakes, eruptions, waves, wind, forest destruction, mining, waste and piles of rubbish are real threats to survival. humans and other creatures, (Barral, 2012). Economic development sometimes triggers damage, because developments in industrial and economic needs such as the need for energy, land, agriculture, water and natural resources can reduce ecosystem function and environmental quality, (Samuel, B. Graves, Sandra A. Waddock, 1994).

Environmental development plans have been around since the 1970s, after which a High Level Conference (Summit) between countries was held in 1992, the Millennium Declaration by the United Nations (UN) in 2000, then the Johanessburg Declaration in 2002, (Sahoo & Goswami, 2024). Millennium Declaration or *Millennium Development Goals* (MDGs) in 2015 involved 191 member countries discussing sustainable environmental development by 2030, (Greig & Turner, 2024). International level conferences and meetings will be the basis for earthlings to place forests and the environment at the heart of the world. Apart from that, increasing global welfare, eradicating poverty,

hunger, reducing death rates, providing educational facilities, improving the quality of health, encouraging gender equality, fighting*human immunodeficiency virus* (Hiv/Aids) and building global partnerships for environmental, social and economic development, (Henrietta L. Moore, 2015).

Indonesia has also issued policies that lead to sustainable environmental development in each province, these policies are made in the form of regulations, starting from the 4th paragraph of the 1945 Constitution,*All Law*, UU no. 32 of 2009 concerning PPLH, Law no. 41 of 1999 Forestry Jo. UU no. 18 of 2013 concerning Prevention of Eradication of Forest Destruction Up to Presidential Regulation of the Republic of Indonesia (Perpres) No. 59 of 2017 concerning Implementation of the Achievement of Sustainable Development Goals that sustainable development goals are part of the government's efforts to improve economic welfare, maintain human survival, improve good social life, and improve the quality of the environment and inclusive development from one generation to the next, (Banjaran Aji, 2019).

The issue of sustainable environmental development at the global and national levels is strengthening, but the facts continue to show that forest and environmental damage is increasing. in Bima, West Nusa Tenggara (NTB), characterized by increasing environmental damage, deforestation,*illegal logging*, C excavation, land conversion, forest encroachment, unclean lifestyle, piles of rubbish. This condition caused flash floods that hit the Bima area in 2016, flash floods in Bolo District, Bima Regency in 2018, and floods and earthquakes in Sanggar District, Bima Regency in 2021. Environmental damage will continue to occur if the government is able to find concepts in environmental management in Bima.

METHOD

The research method used is legal-empirical research, which looks at law in real terms. Law is not just understood from the text of laws or regulations, but law must be understood contextually where law works in society. The approach used is a sociological approach and a conceptual approach. Data sources include primary data and secondary data, (Wignjosoebroto, 2009). Primary data is data obtained directly through field surveys or through interviews, documentation and observation. Secondary data consists of books, official documents, journals, previous research, magazines, and social media, etc, (Bachtiar, 2018).

Analysis techniques by collecting data, categorizing and integrating the problems being researched, what respondents or informants state, written or unwritten, is not the absolute truth. The research results obtained will be studied and interpreted based on theory (theoretical interpretation) so as to give rise to hypotheses (*hypothesis*) which then draws an ideal conclusion based on the facts in this research.

RESULTS AND DISCUSSION

1. Pattern of Environmental Damage in Bima NTB

Bima West Nusa Tenggara (NTB) consists of a Regency and a City where both areas are at the eastern tip of West Nusa Tenggara (NTB) Province. The area of Bima Regency is around 4,394.38 km2 consisting of 18 Districts and 191 Villages. Meanwhile, the area of Bima City is around 222.25 Km2 consisting of 5 sub-districts, namely West Rasanae District, East Rasanae District, Asakota District, Mpunda District and Raba District. Judging from the shape of the Bima region, it is an area surrounded by highlands and mountains such as Mount Tambora with a height of 2850 m, Mount Wera with a height of 650 m, Mount Donggo with a height of 280 m, and Mount Lambitu with a height of 1170 m, apart from the lowlands. and rice fields, (Dkan, 2022).

Environmental conditions in the Bima region, West Nusa Tenggara (NTB). This often has a negative impact on the survival of local communities. Where patterns of environmental damage and pollution can be seen from various activities that cause land degradation, pollution and ecosystem damage. As follows:

1.1. Forest destruction

For land and forest areas, Bima City and Regency each have quite large forest areas, say Bima Regency with a forest area reaching 276,519.72 hectares (2001-2023), the forest area area is estimated to decrease by 20% to reach the figure 253,396.33 hectares year (2024). Based on the report from the Environment and Forestry Service of West Nusa Tenggara Province, the total forest figure for Bima Regency for 2024 is estimated to be around 25,039,642 hectares, this figure is decreasing from previous years. Meanwhile, the total forest area in Bima City reaches 947,352 hectares, (Afrizal, Markum, 2024).

Judging from the types and functions of forest areas, the forest typology in Bima includes protected forest areas, conservation forest areas, nature reserve forests, natural tourism park forests, and permanent production forests and limited production forests with a total accumulated area of 25,986,994 hectares (2017- 2023). However, most of these forest areas have changed their status to critical land and deforested forests. The condition of deforested forests is that sometimes some are naturally deforested,

some are deforested due to human activities such as forest encroachment, clearing of agricultural land, illegal logging (*illegal logging*), even to the extent of tenure conflicts or claims to control forest areas, as in Table 1 below:

Table.1. Area (ha) of Forest Damage Based on Type of Problem 2020-2024

Classification of Area Control and Forest Destruction				
City and Regency of Bima	Problem Type	Area (ha) of damage	Forest Area	Year
Pusu and Wadu Ruka Villages, District. Langgudu. Regency. Bima	Onion plantations, road paving, illegal logging and encroachment	60,2	Nipa Pusu/HL	2020-2022
Madawau Village, District. Madapangga. Regency. Bima	Forest encroachment for corn fields	100	Toffo Rompu/HL	2020-2022
Wane Village, District. Parado. Regency. Bima	Forest encroachment for corn fields	43	Toffo Rompu/HL	2022-2023
Tarlawi Village, District. Wow. Regency. B ima	Forest encroachment for corn fields	2,510	Donggomasa	2022-2023
Kolo Village, District. Asa City	Settlements and active land	183	Nanga Na'e Kapenta	2023-2024
Amount		**388.71**	**Hectare**	

Source: Dlhk, NTB Province 2024

Based on table. 1. above shows that the pattern of forest damage in Bima is not only caused by activities illegal *logging* but also caused by inappropriate use and management of forest areas. The use of forest areas or forest area borrow-to-use permits (IPPKH) of several thousand hectares in Pusu Village, Wadu Ruka Village, Langgudu District, Bima Regency reached 60.2 hectares, which in 2020-2022) it was recorded that around 18 hectares of protected forest areas were being cultivated into onion land, then 39 hectares became agricultural land and 3.2 hectares were used for paving the So'Nipa Pusu road. For Madapangga District, Parado, Wawo District, Bima Regency, most of the protected forest (HL) status has changed to corn planting land with a total of 145.51 hectares (2020-2023). Meanwhile, the So'Nangana'e Sori Kapenta forest area, AsaKota Bima District, around 183 hectares, has been converted into a residential area and active land.

1.2. Garbage Piles

Waste management is still not effective, because there are many piles of waste, both organic and inorganic waste, which cannot be managed properly. Field data shows market waste in Rato Village, Bolo District, Bima Regency, specifically in large markets and small markets. The large market is the economic center of the Bolo community in Bima Regency, where this large market is the main market where various community needs are sold, such as foodstuffs, clothing and household furniture. Meanwhile, small markets are centers of relatively small trading activities such as selling local plantation products. Trading activities in large markets and small markets make the pile of waste bigger and cannot be managed properly. Piles of rubbish will have negative impacts on the environment and human health, such as soil pollution, water pollution, air pollution and the ecosystem. Meanwhile, the impact on health can cause infectious diseases, attack the respiratory tract, contaminate food and drinks. Several places in Bima City and Regency are the center of piles of rubbish, as in the following picture:

Figure 1. Piles of Garbage in Bima City and Regency

Based on Figure 1 above, it shows that several areas of Bima City and Regency are filled with large piles of rubbish consisting of various types of waste such as plastic, paper, wood, metal and several other materials. The piles of rubbish almost cover the entire surface of the land and beach. This situation certainly has an impact on human health and all living creature

1.3. Use of Fertilizers and Pesticides

The use of several thousand (hectares) of land and forest for planting corn, as in this research sample was carried out in Tarlawi Village, District. Wawo, Bima Regency, where Tarlawi residents are mostly corn farmers, whether they work as teachers, village officials, or ordinary people, are all corn farmers. In 1 (one) family head there is someone who has 2.-3 (ha) of land. Of the total population of Tarlawi, there are around 250 heads of families who have corn land with an area of 2.00 (ha), 362 heads of families who have corn land with an area of 3.00 (ha) and 231 heads of families who have corn land with an area of 4.00 (ha). ha), with an accumulation of around 843 heads of families consuming 2,510 (ha) of land and forest. This corn planting program is not only in Tarlawi Village but also in several other sub-districts such as Bolo, Madapangga, Woha, Langgudu, Wera, Lambitu, Parado, Donggo, Sanggar, Tambora sub-districts, Palibelo sub-district, Bima Regency.

As corn planting continues to grow in Bima City and Regency, the use of fertilizers and pesticides has increased. Bima Regency occupies the highest position in terms of use of fertilizers and pesticides, as shown in Table 2. below this

Table. 2. Amount of Fertilizer and Pesticide Use on Corn Plants in Bima Regency in 2023-2024

Use of Fertilizer Based on Type		Pesticide Use
Organic (Tons)	An-Organic (Tons)	Insecticide = 430,750
Solid=80,765	Urea=48,807	Herbicide = 3450500
Liquid=50,243	SP 36=924.50	Fungicide = 40,750
	NPK=14,736	
	ZA=407	

Source: Primary Data after processing, 2024

The use of fertilizers and pesticides in Bima Regency, both organic fertilizer and inorganic fertilizer in 2023-2024, is quite high, for solid organic fertilizer there is around 80,765 (Tons) plus liquid fertilizer 50,243 (Tons). Meanwhile, the use of inorganic fertilizer of the Urea type is around 48,807 (Tons), the SP 36 type is around 924.50 (Tons), the NPK type is around 14,736 (Tons) and the use of the ZA type fertilizer is around 407 (Tons). The amount of weed-killing chemicals used on corn plants is around 430,750 kg of insecticide model, 3450,500 kg of herbicide model, 40,750 kg of fungicide model. Excessive use of organic fertilizers and inorganic fertilizers will have an impact on soil function. According to Murnita & Yonni Arita Taher, the use of organic and inorganic fertilizers in a short period of time does make the condition of the plant land more fertile if absorbed directly by the soil, but in the long term it actually has a negative impact on the soil or land, apart from the soil hardening the soil. will also be destroyed and the population will decrease, (Taher, 2021).

Meanwhile, high use of pesticides causes poisoning in humans and animals. The pattern of good use of pesticides by some communities is still lacking, where people do not look in detail at the instructions on the packaging, when spraying, the chemicals will spread into the atmosphere and then attack human health. The nature of the pesticide itself will be toxic which can cause various diseases such as cancer, shortness of breath, mutations, birth defects, etc. The impact of pesticides on the environment triggers pollution on agricultural land. According to Ahmad Dhiyaul Dhaifulloh et al "some of the impacts of using pesticides on the environment include the extinction of species, animals will die and become poisoned, killing off predators and the extinction of predators themselves giving rise to insects that breed without control, then soil and land fertility will decrease," (Dhaifulloh et al., 2024). Good pesticide use patterns are important to improve the quality of a sustainable environment.

2. Sustainable Environmental Management Based on Local Wisdom of the Mbojo Bima Tribe, NTB

Currently, it is important for humans to find a good approach to managing the environment because with good concepts and approaches, the environmental atmosphere, planet and natural ecosystems can survive. A management approach is a way or strategy to find solutions to the problems faced. In terms of environmental management, various approaches have been taken, such as paradigms *deep-ecology* who

sees environmental and natural issues as not limited to a narrow space. *Deep-ecology* consider all natural ecosystems are an integral part of humans, *deep-ecology* does not view the world as a collection of separate objects, but as a balance that is fundamentally interdependent, (Light, 2002).

In Prophetic Social Sciences (ISP) also found a balance between nature and humans. Human presence in the universe is not exploitative, but humans are present to manage nature sustainably, (Absori et al., 2017). Prophetic Social Science (ISP) reveals the good relationship between humans, nature and God, where humans are required to develop missions of humanization, liberation and transcendence. Humanization forms people with noble character and knowledge both intellectually, emotionally and spiritually. Liberation is the liberation of humans from oppression, ignorance and poverty. Meanwhile, transcendence guides humans on the right path through the process of awareness of self-servity to God, (Dimyati & Kelik Wardiono, Ridwan, 2015).

Based on the views above, the steps and strategies that need to be taken in environmental management, it is necessary to find a solution which will then become an offer for a sustainable environmental management approach. The Bima people actually have strong cultural modalities and local wisdom regarding ecological philosophy, Because historically the Bima people have local traditions regarding how to maintain human balance with the natural ecosystem. The environmental management traditions of the Bima community can be classified into the following aspects:

1.1. *Parafu* Tradition

Based on the habits of the Mbojo Tribe or Bima people from ancient times to the present, the term *parafu* is a system of teachings passed down from ancestors. *Parafu* itself has shaped the attitudes and behavior of the Bima people to remain a society that adheres to cultural values, the value of the sanctity of the spirits of their ancestors and the value of environmental wisdom. According to Bima cultural observer, Alan Malingi, he stated that the word *parafu* basically means "*parafu ro waro*" which means a leader (*sneeze*) have the authority and skills to carry out ritual routines such as building communication with ancestors to remain with the community in protecting and caring for springs and trees, (Nukman, 2018).

According to some people from the Mbojo Bima Tribe, they are still strong in their local wisdom values and traditions *parafu* still implemented by some Bima people. Implementation of traditions *parafu* by looking after and treating some springs that are considered as springs of ancestral or ancestral heritage. Spring point *at death* The Bima region is now well managed by the community, such as the springs on the slopes of Mount Lambitu, Bima Regency. The springs are in Kuta Village and Sambori Village, Lambitu District, Bima Regency, local people know the springs as Lambitu mountain slope water or in Bima language it is known as *hi lanco, hi mbou, hi ama saleh, dan hi lombi*, while the spring point in Sambori Village is known as *oi la Ngganci, oi matangando, oi kalo, oi dewa ompu manda and oi sanindi*, (Mbojoklopedia, 2022).

Pata is essentially in tradition *parafu* The Mbojo Bima tribe requires the government, community leaders, traditional leaders, cultural figures and all elements to play an active role in developing local wisdom values. The government and elements of society have good intentions to revive Bima's local traditions with the hope that these traditions will become a modality and basis for managing a sustainable environment in Bima.

1.2. *Ngaha Aina Ngoho* Tradition

Ngaha aina ngoho is a tradition and philosophy of life of the Bima people since ancient times. Philosophy *Ngaha aina ngoho* emphasizes that human life must adhere to environmental morals and ethics, meaning that nature is not to be exploited, but to be managed and utilized according to life's needs. The roots of paradigm studies *Ngaha aina ngoho* starting from the rejection of exploitative attitudes and behavior developed by the anthropocentric paradigm where exploitative behavior has triggered many problems in the environment and forests such as illegal logging, deforestation, piles of rubbish, waste, to the occurrence of landslides, floods, drought and death.(Banjaran Aji, 2019). It was through President Soeharto's Central Government Program (1966-1998) that the "Padi Gogo Rancah (Gora) system was introduced for the government of West Nusa Tenggara (NTB) Province which then brought NTB to become a National food self-sufficient region and even at the international level, (Iqbal, 2023).

Philosophically *ngaha aina ngoho* talks about ecological and environmental ethics, but is enthusiastic about developing traditions *ngaha aina ngoho* also encouraged through government programs. That's what the previous Bima people thought *ngaha aina ngoho* this is directly related to the

way or pattern of human behavior in farming, where some Bima people farm in paddy fields, there are also those who farm in mountainous areas and Bima people who farm in mountainous areas must adhere to the values and philosophy *ngaha aina ngoho* namely “eat in moderation according to your needs, don't eat too much to the point that it causes damage to nature and environmental sustainability”,(Tati Haryati, 2024). This philosophy provides a basic understanding of the concept of managing forests and the environment by balancing economic needs with environmental sustainability. Simply put, humans can farm but don't destroy forests and the environment.

CONCLUSION

Based on the results and discussion of the research above, it can be concluded that the pattern of environmental damage in the Bima region, West Nusa Tenggara (NTB), Firstly, Bima Regency and City experienced quite serious environmental damage, starting from the decline in forest function with an area of 276,519.72 hectares in 2001. -2023. In 2024, the decline in forest function will be around 253,396.3. In addition, piles of rubbish in the region pollute the land and beaches, and excessive use of fertilizers and pesticides has a negative impact on soil fertility and human health. Irregular use of pesticides causes poisoning and various diseases as well as damage to the ecosystem. Furthermore, the *ngaha aina ngoho* tradition teaches people to manage nature ethically and not exploitatively, prioritizing a balance between human needs and environmental sustainability. These two traditions serve as a guide in creating sustainable environmental management in Bima, with the hope that these traditions can become the basis for better environmental management in the future.

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