Determining the Characteristics of Replacement Baseline Islands to Counter the Retreat of Indonesian Archipelagic Baselines as a Result of Climate Change

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Global climate change has led to significant sea level rise and is directly affecting the existence of small islands in Indonesia's outermost regions. Several islands that served as baselines for the archipelago have shrunk with the potential to sink, threatening the validity of Indonesia's maritime claims under international law. The aim of this study is to identify the characteristics of replacement islands suitable to serve as new baselines to ensure the continuity of Indonesia's maritime borders. The methods used are descriptive and explanatory approaches, with spatial analysis based on geographic coordinate data and qualitative assessment based on *Resource-Based Theory* (RBT). The five main criteria used as reference include: (1) geographical proximity to the home island, (2) permanence and physical stability, (3) legal status, (4) strategic and defense value, and (5) conformity with the provisions of UNCLOS 1982 and national regulations. Based on these criteria, islands such as Sabang, Sekanak Raya, Kawio, Karatung and Raijua are proposed as potential replacements for the affected baselines. The results of the study show that a multidimensional approach based on RBT theory and spatial data can be a scientific and legal basis for the formulation of adaptive strategies for determining maritime baselines. This strategy is crucial to maintain the legitimacy, continuity and sovereignty of Indonesia's marine areas amidst the challenges of global climate change.

KEYWORDS

~ Replacement islands
~ Starting points
~ Archipelagic baselines
~ Climate change
~ Small islands

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1. INTRODUCTION

The ocean has enormous potential to contribute to tackling climate change (Guldberg, 2023). This idea is based on several scientific facts, including (a) the ocean is an integral part of the global climate system, (b) the ocean is a critical buffer against climate change, and (c) the relationship between climate action and action in the oceans is inherent; therefore, it is necessary to improve cross-sectoral methods in an integrated and collaborative manner (Law, 2019). Due to the ongoing warming of the deep ocean and the melting of ice sheets, sea level rise is inevitable and will remain at an elevated level for thousands of years (Oral et al., 2024).

Rising sea levels in coastal areas will cause, among other things, land loss, damage to coastal ecosystems, damage to coastal infrastructure and buildings, and threaten the population in coastal areas, which will undoubtedly result in enormous material losses (IPCC, 2023; Reguero, 2021). This direct threat to the coastal region will significantly affect Indonesia as an island nation with the longest coastline in the world. The sinking of an island can change the coastline which, pursuant to international maritime law, can push the baseline back closer to the mainland. This has a direct impact on the delimitation of a country's territorial waters, additional zones and exclusive economic zone. Rising sea levels will push the coastline further into the mainland, causing the mainland to shrink and be flooded by seawater (Oliver Smith, 2009).

The potential sinking of the outermost small islands as a basis for the withdrawal of the baseline affects the boundaries of the national territory (Isabelle, 2018; Wright, 2018; Kumar, 2016). The territory of a small island depends on the size of the island pursuant to Article 1, paragraph 1, Article 1, paragraph b of Presidential Regulation of the Republic of Indonesia No. 78 of 2005 on the Administration of Small Outer Islands. The boundaries of Indonesia's outermost small islands are expected to change significantly over time due to climate change, particularly rising sea levels. For example, islands such as Rondo, Sekatung, Marore and Marampit currently have normal baselines measured along the low tide line on the coast. These islands are particularly prone to flooding and morphological changes as they are low-lying and exposed to the open sea. In contrast, Dana Island, which is part of the southern maritime boundary, is part of the Straight Archipelagic Baseline system under Article 47 of the United Nations Convention on the Law of the Sea (UNCLOS). Indonesian regulations have determined the area or territory that is less than or equal to 2,000 km^2 (two thousand square kilometers) and has important geographical coordinates connecting the archipelagic sea baseline under international and national law (Wahyudi, 2020; Law, 2019; France-Presse, 2016).

Indonesia is known as an archipelagic country in terms of delineating maritime boundaries. The disclosure of the baselines of coastal states is crucial to avoid territorial losses that could lead to disputes between these states. On March 11, 2009, the Indonesian government submitted Government Regulation No. 37 of 2008, reference number M.Z.N.67.2009.LOS, which establishes the baseline of the coordinates of the Indonesian archipelago, to the UN Secretary-General. The baseline of the state will theoretically not change as long as it is filed with the UN Secretary-General.

Of the 92 outermost islands, 183 baselines are located on the outer capes and in the coastal areas. Twelve of the outermost islands require special attention as baseline determination depends on them. These islands are Rondo Island in Nangroe Aceh Darussalam, Berhala Island in North Sumatra, Nipa Island and Sekatung Island in the Riau Archipelago, Marore Island, Marampit Island and Miangas Island in North Sulawesi, Fani Island, Fanildo Island and Bras Island in Papua, and Dana Island and Batek Island in East Nusa Tenggara.

According to research data of the National Agency for Research and Innovation for 2022, the land area of Rondo Island, located at the western end of the Strait of Malacca in Aceh, is decreasing by 1,856 m2 per year (BRIN, 2024). This is due to the rise in sea level by 1.30 mm per year. Sea level is also rising by 3.46 mm per year on Berhala Island, which is located in the waters of eastern Riau Province, and by 3.48 mm per year on Nipah Island in the Riau Islands. Miangas Island (3.2 km^2), which lies on the border between Indonesia and the Philippines, has had a 0.02% decrease of its total surface or approx. 0.00064 km^2 per year since 2004. The total surface of Sekatung Island (1.65 km^2) in the North Natuna Sea in the Riau Islands has also decreased by 0.66% (approx. 0.01989 km^2 per year). The surface of Berhala Island in the Strait of Malacca also decreased by 0.002 km^2 (BRIN, 2024). This could lead to the loss of the outer islands.

The disappearance of these tiny islands will not only reduce Indonesian territory, but will also have legal consequences for the state's marine affairs. Indonesia's ability to maintain its jurisdiction over the national maritime zone, particularly in areas disputed with other countries, will be significantly affected if the small outermost islands disappear or become submerged.

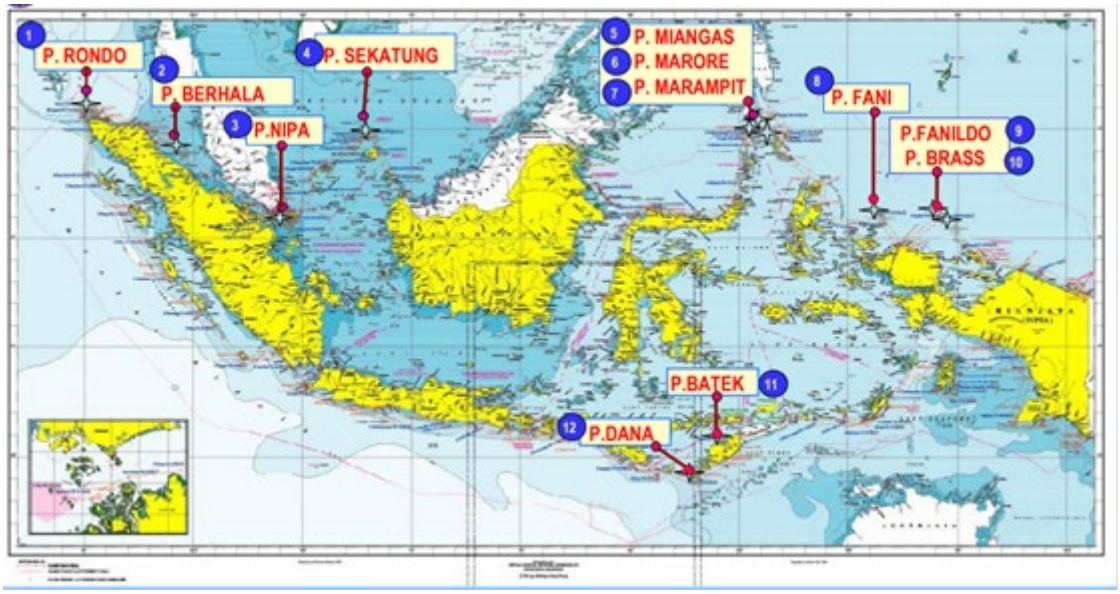

Figure 1: Map of Indonesia's outermost island
Source: Defense Ministry of the Republic of Indonesia, 2010

Coastal states must publish their baseline map to avoid losing territory that could become a battleground between the coastal states. However, suppose one of the islands disappears or becomes an uninhabitable reef. In this case, the reef remains a baseline as long as the geographical map of the island state is not renewed, pursuant to Article 76 (9) of UNCLOS 1982. The archipelagic baseline is a permanent feature once it is registered with the Secretary-General of the United Nations, so that the continental shelf of a coastal state is not affected once its outer coastline is established. An exception is if one of the islands sinks and disappears completely. In theory, the baseline of the state does not change as long as it is deposited with the UN Secretary-General (Soons, 1990).

The existence of national territory is essential as this element proves the existence of a country (Werner, 2023). In the international legal order, territory is one of the most important characteristics of a country (Malcolm N, 2008). A country can only be recognized internationally if it has clear physical boundaries. In this case, the country can exercise its sovereignty and all the powers associated with it. One of the general principles of this law is to close the loophole and avoid undermining international law due to an inability to determine a country's boundaries due to under-regulation.

There is an urgent need to delineate borders as the filed border is an administrative issue that will affect the claims for establishing baselines, including Indonesian baselines (Patmasari, 2008). Another assumption is that there will be protest notes from other countries regarding the way Indonesia determines starting points and archipelagic baselines due to its outermost islands being affected by climate change (Vinata, 2023).

The paper consists of six sections. The first section introduces the reader to the Indonesian archipelagic baseline and how it is presented in the scientific literature. The second section explains the methodology. The third section analyzes the characteristics of the outermost replacement island, which can serve as a starting point for establishing the baseline of the Indonesian archipelago in the context of climate change. The fourth section summarizes the analysis of the Indonesian archipelagic baselines and the characteristics of replacement islands in establishing the Indonesian archipelagic baseline. The sixth section contains conclusions and suggestions for future research. The aim is to identify the characteristics of replacement islands that Indonesia could use as a reference to provide legal certainty regarding straight archipelagic baselines.

2. METHODOLOGY

This study uses a descriptive and explanatory approach to identify the characteristics and criteria for selecting islands that have the potential to be replacement islands to serve as a starting point for establishing the new baseline of the Indonesian archipelago due to the subsidence of the outermost islands as a result of climate change. The data analysis will be conducted in three main stages.

Spatial Analysis based on Geographic Information System Theory: The researcher conducted a manual mapping of the position of the outermost islands and the islands that have great potential to serve a replacement baselines by comparing latitude and longitude coordinates. The analysis was conducted to determine their geographical proximity in the configuration of the archipelago of the Republic of Indonesia in accordance with the provisions of UNCLOS 1982. The calculation of the distance between the points also needs to take into account the proximity of the replacement island to the source island. Islands that have the potential to serve as baselines for borders with other countries include:

Table 1: Islands to be examined and researched based on coordinates

Original island	Original coordinates	Replacement island	Alternate coordinates
Rondo Island	06°04′30″ LU, 95°06′45″ BT	Sabang Island	5°49′N, 95°17′E
Pulau Sekatung	04°47′38″ LU, 108°00′39″ BT	Sea Island	3°40′50″ LS, 116°09′49″ BT
Pulau Marore	04°44′14″ LU, 125°28′42″ BT	Kawio Island	4°40′16″ LU, 125°25′41″ BT
Pulau Marampit	04°46′18″ LU, 127°08′32″ BT	Pulau Karatung	4°43′44″ LU, 127°04′25″ BT
Dana Island	11°00′36″ LS, 122°52′37″ BT	Pulau Raijua	10°39′00″ LS, 121°35′00″ BT

Qualitative assessment using resource-based theory (RBT): resource-based theory is used to assess each island that has the potential to be a replacement island against four main criteria: Value: strategic value for the defense of maritime sovereignty claims; Rarity: the geographical and legal characteristics of the island; Replicability: its strategic function; Organization: the country's ability to administratively and legally manage the island. This approach closes the methodological gap between the spatial and legal analysis, while also forming a theoretical basis for baseline renewal. The relevance of this approach is also supported by similar studies analyzing the strategic geopolitics and territorial resources of countries (Gullett, 2018).

3. CHARACTERISTICS OF INDONESIA'S OUTERMOST ISLANDS AFFECTED BY CLIMATE CHANGE

In the diverse geological forms of the archipelagos, islands form groups and spread out. Archipelagos can consist of islands and rocks that form a reef and extend like a peninsula. In the general definition of archipelagos, Evenses emphasizes that an island country is a formation of two or more islands (islets or rocks) which can geographically be considered as a whole, and defines an island country as having the following characteristics (document A/CONF.13/18):

- *Many relatively large islands are scattered over an area in a non-linear pattern.*
- *The islands are geographically connected to each other and to other islands in the group (adjacency).*
- *The political administration considers the islands as a unified whole.*

Small islands are defined on the basis of two main criteria - surface and the number of inhabitants. The definition of small islands, adopted at the national level by Presidential Decree No. 6 of 2017 concerning the Management of Small Outermost Islands, stipulates that they are islands with the surface of no more than 2,000 km2. The archipelago is characterized by geographical unity, i.e. coordinates that connect the baselines of the archipelago in accordance with the international and national legal framework. In addition to these main criteria, small islands are also ecologically separate from their central island or the mainland and have clear physical boundaries. They are isolated from their primary island habitat, i.e. insular. Remote island groups, small outer islands, are of strategic importance due to their rich natural resources and valuable environmental services. They also play a crucial role in safeguarding the sovereignty of the Unitary State of the Republic of Indonesia (NKRI). This region not only provides valuable natural resources such as coral reefs, seagrass beds, mangrove forests, fisheries and nature reserves, but is also of great strategic, defensive and security importance due to its proximity to the Republic of Indonesia.

From a defense and security perspective, small islands, especially along the border, such as Sabang, Sebatik and Batam, are essential gateways for the movement of people and goods, but also prone to the smuggling of illegal goods, narcotics, weapons and illegal drugs. No less than 92 small islands are located on the border with other countries, which means that these small islands are an essential vanguard for maintaining and protecting the integrity of the Unitary State of the Republic of Indonesia (Kanato, 2021; Sodik, 2018).

In order to protect the natural resources of Indonesia's uninhabited islands, increased cooperation with neighboring countries in the area of natural resource management is essential. The following list contains

Indonesian small outermost islands that meet the criteria set out in Indonesian legislation as small islands directly bordering neighboring countries and vulnerable to climate change. In its Sixth Assessment Report (AR6), the Intergovernmental Panel on Climate Change (IPCC) estimates that global sea levels could rise by 60 to 110 centimeters by 2100 under high emissions scenarios. Such a rise would have serious consequences for the territorial integrity of the Republic of Indonesia, particularly for its small outermost islands. Several of these islands - characterized by their low elevation and lack of permanent settlements - are at risk of having their land area significantly reduced or even completely submerged, with up to twelve islands estimated to be affected under the projected conditions. These include the islands of Rondo, Berhala, Nipah, Sekatung, Miangas, Marore, Marampit, Batek, Dana, Fani, Fanildo and Bras, all of which lie along Indonesia's maritime borders and play an important strategic and legal role in defining the country's archipelagic baselines. The small outermost islands are:

Table 2 : Small outermost islands

Island names	Geographical location	Status	Wide / Brief characteristics
Rondo Island	06°04′30″N - 95°06′45″E (Samudera Hindia)	Uninhabited	Coral cluster, 137 m high, rugged beach
Berhala Island	03°46′26″N - 99°30′03″E (Selat Malaka)	Uninhabited	Area ±5 ha, near Malaysia
Nipa Island	01°09′13"N - 103°39′11" E (Singapore Strait)	Uninhabited	Eroded by sea sand exports, sinking at high tide
Sekatung Island	04°47′38"N - 108°00′39"E (Natuna)	Uninhabited	Bordering Vietnam, very small (0.3 km²)
Miangas Island	05°34′02"N - 126°34′54"E (Philippine Border)	Inhabited (636 inhabitants)	Area of 62 ha, the northernmost island of Indonesia
Marore Island	04°44′14"N - 125°28′42"E (Near Philippines)	Populated (-640 inhabitants)	Area 168.5 ha, border crossing
Marampit Island	04°46′18"N - 127°08′32"E (Philippines Border)	Inhabited	Area 4.12 km², sloping and rocky beaches
Fani Island	01°04′28"N - 131°16′49"E (Pacific Ocean)	Uninhabited	Basepoint TR.066A
Fanildo Island	00°56′22"N - 134°17′44"E (Near Palau)	Uninhabited	Area 0.1 km², sand & coral
Brass Island	00°55′57"N - 134°20′30"E (Near Palau)	-50 people	Area 3,375 km², base TR.072A
Batek Island	09°15′30"S - 123°59′30"E (Near Timor Leste)	Uninhabited	Near Timor Leste, on a 1925 Dutch map
Dana Island	11°00′36"S - 122°52′37"E (Near Australia)	Uninhabited	Area ±13 km², base point TD.121

4. INDONESIAN ARCHIPELAGIC BASELINE WITHDRAWAL

4.1 The method of delimiting Indonesian archipelagic baselines

Countries with archipelagic characteristics can have straight archipelagic baselines. Pursuant to Article 47 (1) of the 1982 United Nations Convention on the Law of the Sea (hereinafter UNCLOS 1982), an archipelagic country may draw straight baselines connecting the outermost points of its outermost islands and dry reefs; however, these baselines must include the main islands and an area where the ratio of water to land area, including atolls, is between 1:1 and 9:1. This is laid down in Article 47 (1) of the 1982 United Nations Convention on the Law of the Sea (hereinafter UNCLOS 1982). However, this is merely an option and not a requirement. As long as other baselines do not conflict with the marine boundaries of other nations, the governments of archipelagic countries are free to decide how to draw them. The normal baseline and the straight baseline may be used to establish maritime boundaries for non-archipelagic governments in accordance with Articles 5 and 7(1) of UNCLOS 1982. Due to the geographical characteristics of the configuration of the Indonesian archipelago, there can not be only one method of establishing baselines. The island country has

more rights because it not only has the ability to draw straight baselines, but can also use other methods to draw other lines (Baumert, 2015).

The provisions of Article 5 of the 1982 Law of the Sea Convention on normal baselines stipulate that a normal baseline is a low water line along the coast, as shown on large-scale maps officially recognized by the coastal state. The wording in Article 5 of UNCLOS 1982 is the same as the wording in Article 3 of the 1959 Geneva Convention concerning the Territorial Sea and Additional Zones (Convention on the Territorial Sea and the Contiguous Zone). Provisions on straight baselines are contained in Article 7 of the UNCLOS 1982, which is almost identical to Article 4 of the 1958 Geneva Convention concerning the Territorial Sea and Contiguous Zones.

Article 7(1) of the 1982 Law of the Sea Convention stipulates 2 (two) geographical conditions that permit the use of baselines, namely (1) the area or coastline has many sharp bends or deep bays, or the sea cuts deep into the mainland and (2) there are rows of islands along the coast or which are located not far from the coast. Article 7 (2) of the UNCLOS 1982, adds a third geographical condition that allows the drawing of straight baselines - if there is a delta or other natural features and the coastline is very irregular, reference points can be at low-water line projecting farthest into the sea to draw a straight baseline. Some of Indonesia's outer islands that use an archipelagic baseline are: Berhala Island which borders Malaysia; Nipa Island which borders Singapore; Sekatung Island which borders Vietnam; Marore Island which borders the Philippines; Fani Island which borders Palau; Sebatik Island which borders the Philippines; Asubutun Island which borders Australia and Timor-Leste (with the same baseline but with a lighthouse or permanent facility) due to archipelagic baselines TD 105-106.

Article 5 confirms that the baselines run along the coastal low-water line as shown on the large-scale nautical charts officially recognized by the coastal country. Some of the outermost islands that use normal baselines are: Rondo Island, Nipa Island, Marore, Miangas Island, Fani Island and Fanildo Island. The 1982 Convention on the Law of the Sea emphasizes that straight archipelagic baselines may only be drawn from and to the low-water line if a lighthouse or similar installation has been erected on it and it is permanently above sea level, or if the low-water height is wholly or partly at a distance not exceeding the breadth of the territorial sea of the nearest island above sea level, or if general international recognition has been granted for the drawing of straight baselines from and to that elevation (Sefrioui, 2017). Archipelagic straight baselines are used on Nipa Island, Sebatik Island, Asubutun Island, Berhala Island, Sekatung Island, Miangas Island and Fani Island. On the other hand, the straight baseline is used for Rondo Island.

Theoretically, a coastal country can establish new baselines if the coastline shifts due to natural events. However, this poses a problem, as the country territory can shift, i.e. shrink or expand. It can even lead to conflicts if it overlaps with neighboring countries. In this case, an island country has more rights, as it may not only draw baselines using archipelagic baselines, but also other lines, namely those mentioned in Chapter II of UNCLOS 1982.

4.2 Determining the characteristics of replacement islands to counter the retreat of Indonesian archipelagic baselines

There are various opinions according to which the meaning of the outermost point of the outermost islands is that an island country may draw a baseline from the outermost point of an island, namely between capes of an island. Another view is that the principle of drawing archipelagic baselines applies to claim waters, so that drawing a line from cape to cape is incorrect as it would be a virgin claim (Ewell, 1978).

From the perspective of the legal development of Article 47(1) concerning straight archipelagic baselines, the present concept is a legal development of Article 7(1) pertaining to successive baselines. The idea stipulated in Article 7 of the UNCLOS is the same as the arrangement set out in the 1958 Geneva Convention based on the 1951 decision of the International Court of Justice in the British and Norwegian fisheries case. The difference is that Article 7 applies to coastal countries, but the basic principles for establishing these rules are the same. The definition of the general configuration of an archipelago is highly subjective as there are no restrictions on this definition (Barnes, 2022). According to paragraph 3, the baselines of the archipelago, as defined in paragraph 1, are straight lines connecting the outermost points of the low-water line of the outermost islands and dry reefs of the Indonesian archipelago. Article 47(1) of UNCLOS 1982

stipulates that the length of straight baselines for the Indonesian archipelago, as defined in paragraph 4, may not exceed 100 (one hundred) nautical miles, except that 3% (three percent) of the total baselines may exceed 100 nautical miles, up to a maximum length of 125 (one hundred and twenty-five) nautical miles.

Article 121(1) of UNCLOS 1982 does not prescribe any geological or geomorphological requirements. The Court points out the significance of Article 121(3) by stating that the meaning derived from the phrase 'naturally formed area of land" may lead to the inclusion of formations such as dunes, silt, shoals and even rocks in the maritime zone. A maritime formation does not necessarily have to be inhabited or have an economic life. Therefore, denying that a formation is an island just because it is not inhabited and there is no economic activity on that formation is irrelevant (Draper, 1977).

The concept and technology for building artificial islands gives new hope to small island countries that they will manage to counter global warming which can result in their disappearance. The 1982 Convention on the Law of the Sea authorizes coastal countries to construct artificial islands, installations and structures. Although it does not contain a definition of an artificial island and does not stipulate in which way it differs from installations and structures, Article 11 UNCLOS 1982 distinguishes the function of an artificial island from that of a port, which is regulated by Article 11 as follows: 'To delimit the territorial sea, the outermost permanent harbor works which form an integral part of the harbor system are regarded as forming part of the coast. Offshore installations and artificial islands shall not be considered permanent harbor works' (Elferink, 2015; p.3).

It follows that the existence of artificial islands cannot be equated with the facilities of the outermost port. Galea bases his interpretation of Article 11 on the 'permanent' element in Article 11, stating: 'The use of the word 'permanent' is significant as it implies a distinction between the nature of a temporary structure and permanent works.'

A lighthouse alone is not sufficient to establish the sovereignty of a coastal Country over the area of the lighthouse. Suppose that a lighthouse alone is sufficient to establish the sovereignty of a coastal country. In this case, the international law of the sea regime would slide into the anarchism of the international community. The existence of a lighthouse can therefore only serve as a simple baseline. UNCLOS 1982 regulates the presence of lighthouses as part of the maritime delimitation of coastal countries in Article 7(4) of UNCLOS 1982 for coastal countries and in Article 47(4) UNCLOS 1982 for archipelagic countries.

With regard to islands, reefs and low-tide lines, the Court holds the following opinion: 'The tribunal considers that a rock cannot be transformed into a fully entitled island through land reclamation, just as a low-tide elevation or area of the seabed cannot be legally transformed into an island through human efforts.' The status of formations must be assessed in the light of their inherent conditions. (Gullett, 2018).

The Court further criticized the country's use of technological progress as a justification for the construction of artificial islands, stating that 'the purpose of Article 121(3) as a provision of limitation would be frustrated if States were allowed to convert any rock incapable of sustaining human habitation or an economic life into a fully entitled island simply by the introduction of technology and extraneous materials.' It could no longer serve as a workable barrier to stop States from asserting their right to potentially vast marine areas. (Faccio, 2021). Then, the Court stated that in case of maritime formations, the 'natural conditions' of these natural formations must be taken into account, which the Court explained as follows: "In those cases, the Tribunal believes that the Convention mandates that a feature's status be determined using its earlier, natural conditions, before major human modification began, while also considering the best available evidence of the high-tide features' previous status prior to intensive modification.' The conversion of natural features into artificial islands is not possible either normatively or through the jurisprudence of international courts. There is no justification for coastal countries to alter low water levels and their coral reefs to make them habitable for humans (Chen, 2022).

The concept of the artificial island gives new hope to countries affected by global warming and small countries that do not have enough land to develop their country’s economic capacity. For this reason, analyzing the change in natural conditions becomes a fundamental starting point, not to give the country unfounded discretion to build artificial islands in any sea area, but on a humanistic basis in the interest of the country that artificial islands. Coastal countries may restore or replace lost baselines, subject to the criteria set out in Articles 5 and 7 of UNCLOS 1982 for normal and straight baselines depending on the geography of their respective

countries. Article 7(2) of UNCLOS 1982 states that the straight baseline is used when the coastline is unstable due to natural conditions, unless the coastal country modifies it.

As an island country, Indonesia is determined to maintain its islands as a decisive factor in determining its maritime boundaries. Therefore, Indonesia must continue to protect these islands in the face of rising sea levels. Indonesia has taken several measures to preserve its sovereignty, including the submission of PP No. 37 of 2008 to the UN Secretary-General on March 11, 2009. This document with reference number: M.Z.N.67.2009.LOS establishes the baseline coordinates of the Indonesian archipelago. Under Article 62 of the Vienna Convention on the Law of Treaties (VCLT), international agreements have a final and permanent character. The consequence of the signature or voluntary submission of a country to the said treaty is therefore the validity of the original treaty, even if there is a change or shift in the coastline.

However, if a neighboring country sues for modification of the contents of an agreement or *rebuc sic stantibus*, so that it may declare an agreement invalid by submitting an amendment or seek to negotiate a new agreement based on the existing terms and facts, Indonesia may refer to the principle of *uti possidentis juris,* i.e. refer to the colonial inheritance border agreement. Uti possidentis juris is one of the sources of international law, as it is one of the principles of general law recognized by civilized countries and can be used as one of the guidelines for determining the boundaries of a country under international law. Renegotiations were conducted with the neighboring countries to determine the ownership rights of each individual country.

4.3 Islands that have the potential to be replacement islands for determining new baselines

According to international maritime law, in particular UNCLOS 1982, Indonesia as an island country may draw a straight baseline from the outermost points of islands and coral reefs that are permanently on the sea surface (UNCLOS, 1982; Soons, 1990). If a baseline point is lost due to the sinking of an island, efforts must be made to find a replacement island. In this study, several islands were identified as potential replacement islands based on five main criteria: (1) geographical proximity, (2) permanent appearance, (3) legal status, (4) strategic and defense value, and (5) compliance with Article 47 of UNCLOS 1982 and Government Regulation No. 37 of 2008. Choosing a potential island as a replacement island aims to ensure the continuity of Indonesia's maritime territorial claims and uphold maritime boundary laws in the face of maritime features disappearing due to climate change.

Global climate change has led to a significant rise in sea level that directly affects the existence of Indonesia’s small islands, especially outermost islands that serve as the baseline for the archipelago. Several islands, such as Rondo Island, Nipa Island and Dana Island, have a shrinking land surface and even the potential to sink (IPCC, 2023; BRIN, 2024). Therefore, Indonesia needs to urgently identify a potential replacement island to maintain the national maritime boundary with other countries. Based on the results of the analysis, there are five main criteria for identifying islands that can be considered replacement islands:

a. Geographical proximity, to ensure the configuration of the archipelago and avoid diplomatic tensions with neighboring countries.
b. Permanent appearance and physical stability, i.e. islands must be above sea level at all times, even at high tide, and must not be seasonal or temporary.
c. Legal status must be recorded in official government documents and maps and they must not be located in disputed areas.
d. Strategic and defensive value, including the potential for installations such as lighthouses, observation posts, or small military bases as symbols of state sovereignty.
e. Compliance with the provisions of UNCLOS and national regulations, such as the maximum extent of the baseline (100–125 nautical miles) and the ratio of sea to land between 1:1 and 9:1.

With reference to data on coordinates and official documents, some of the islands proposed as potential replacement islands include:

a. **Sabang** has the potential to be a replacement island for **Rondo**. Sabang is considered to be the island most likely to replace Rondo as the base point of the baseline of the Indonesian maritime territory in the northwest.

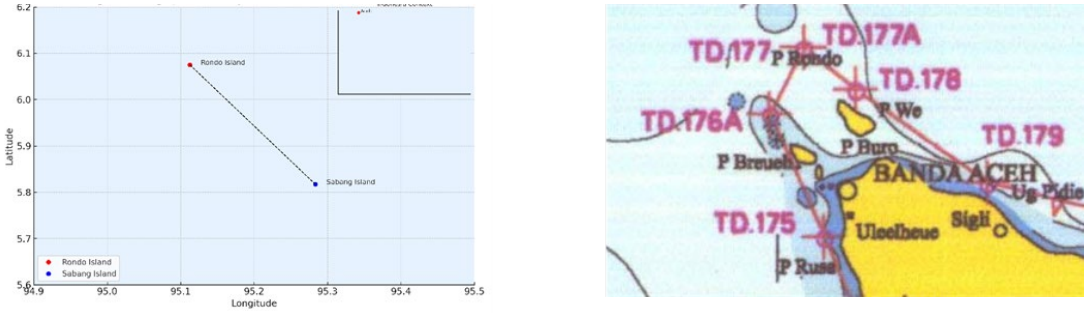

Figure 2: Sabang and Rondo islands
Source: Deposited list of geographical coordinates of Indonesian archipelagic baseline points based on the Government Regulation of the Republic of Indonesia

The island of Sabang has a high strategic value as its location serves as the main monitoring point for maritime traffic in the Strait of Malacca and the northern Indian Ocean. Sabang is located in Indonesia's unique westernmost geographical location and has a permanent dry land area that other surrounding islands do not possess. This makes its existence functionally and spatially difficult to replace. The physical characteristics and geopolitical location of Sabang Island cannot be replicated by any other island, especially given its long-standing strategic role related to defense and maritime border surveillance. Sabang Island already has adequate legal and administrative infrastructure, including ports, military facilities and a clear legal status as part of Sabang City in the Aceh Province. Sabang Island is a strategic maritime asset that is geographically, legally and strategically suitable as a replacement for Rondo Island when it comes to determining the baseline of the Indonesian archipelago.

b. **Sekanak Raya Island** has the potential to be a replacement island for **Nipa**, which has suffered severe physical damage.

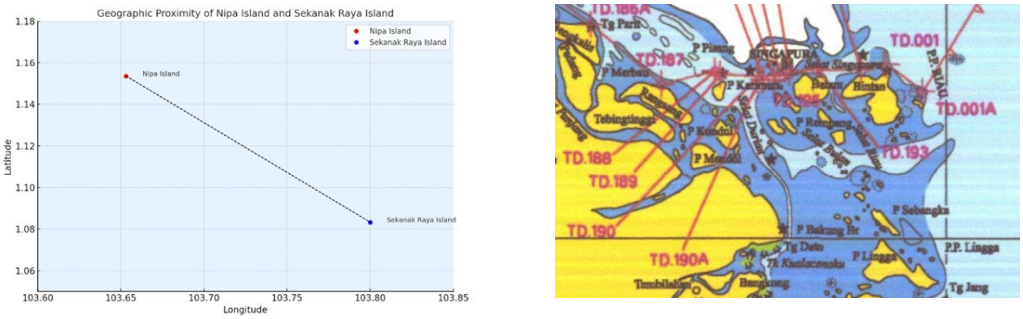

Figure 3: The islands of Sekanak Raya and Nipa
Source: Deposited list of geographical coordinates of Indonesian archipelagic baseline points based on the Government Regulation of the Republic of Indonesia

Geographically, the island of Sekanak Raya is located in the Riau Islands, in a relatively narrow radius around the island of Nipa in the Philips Strait. Spatially, the island is still in the configuration of the baseline of the Indonesian archipelago, which is coherent and does not violate the geographical principles laid down in Article 47 of UNCLOS 1982. Sekanak Raya Island is located within the legal jurisdiction of the country, not in the disputed area, and is depicted on the official map of Indonesia. Therefore, the island is suitable from the legal standpoint. Sekanak Raya Island is strategically located and there are not many other islands in the region with similar stability. Therefore, Sekanak Raya Island serves not only as a physical replacement but also as a new strategic base to ensure the validity of

Indonesia's maritime territorial claims in the western region while maintaining the legitimacy of the maritime boundaries affected by the damage to Nipa Island.

c. **Kawio** has the potential to be a replacement island for **Marore**, with a position that supports geopolitical and security functions in the northern region of Indonesia. Kawio Island has a geopolitical advantage as part of the Sangihe Islands cluster in North Sulawesi, which is directly adjacent to the Philippine Sea area. This makes it an ideal point for maritime surveillance and border defense, as well as a symbol of state sovereignty.

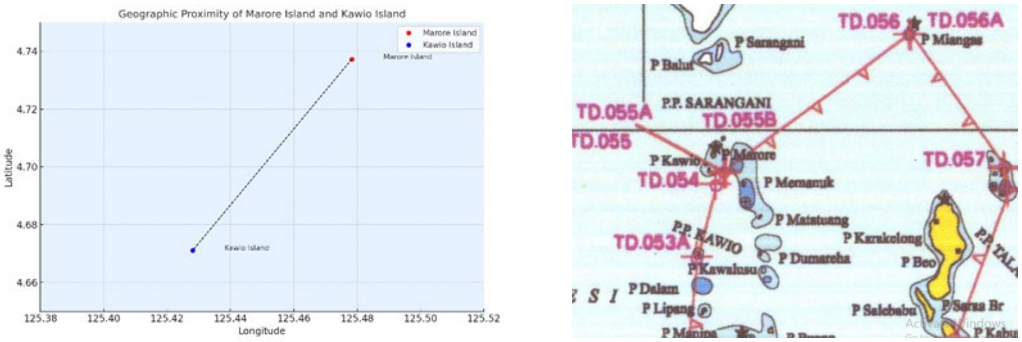

Figure 4 : Kawio Island and Marore Island

Source: Deposited list of geographical coordinates of Indonesian archipelagic baseline points based on the Government Regulation of the Republic of Indonesia

d. **Karatung** has the potential to be a replacement island for **Marampit** due to its geographical similarity and proximity. Geographically, Karatung is very close to Marampit; this proximity not only supports the continuity of the configuration of the Indonesian archipelago, but also maintains the coherence of the baseline in accordance with the provisions of Article 47 of UNCLOS 1982.

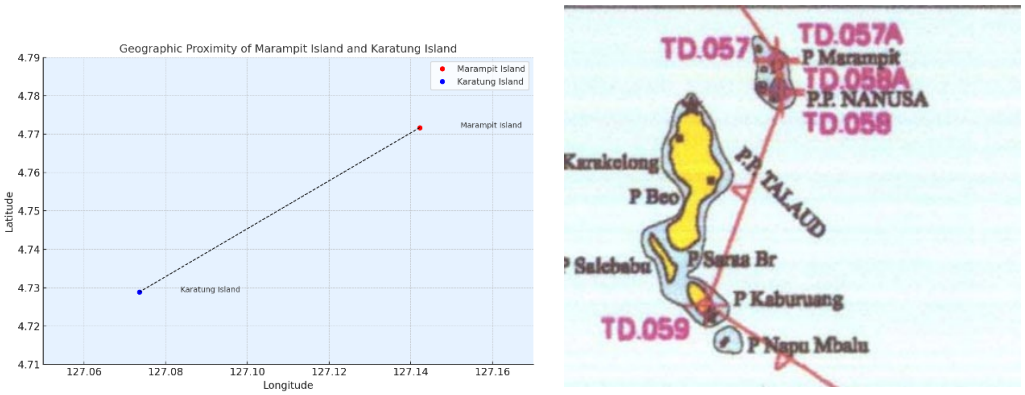

Figure 5 Karatung Island and Marampit Island

Source: Deposited list of geographical coordinates of Indonesian archipelagic baseline points based on the Government Regulation of the Republic of Indonesia

In terms of similarity of topography and physical condition, the two islands have rocky beaches and similar dry land surfaces, and belong to the North Sulawesi border island group. Karatung Island is not only spatially but also geopolitically suitable as it is located at the sea passage between Indonesia and the Philippines.

e. **Raijua** has the potential to be an alternative to **Dana** Island as it has a population, a stable land mass and a strategic position in the southern border constellation. Dana Island, while geographically important, is uninhabited, has a relatively small land surface and unstable environmental conditions that do not allow for long-term infrastructure. By contrast, **Raijua**, located at **10°39′00" S** and **121°35′00" E**,

has the strategic advantage of being an inhabited island with a relatively stable local administrative structure and land topography.

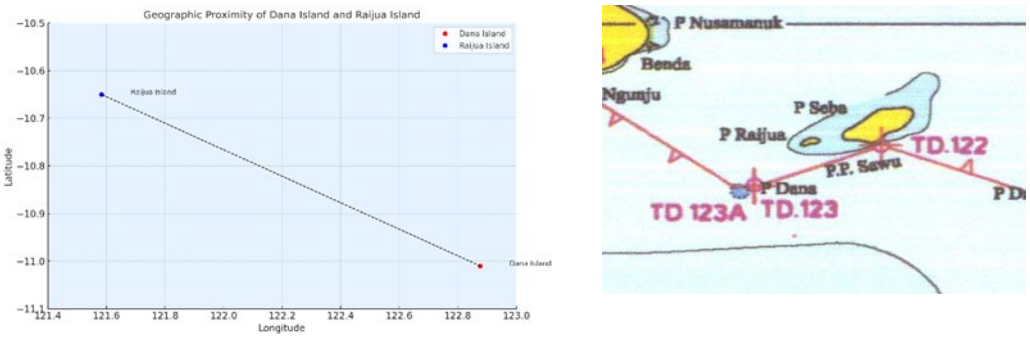

Figure 6: Raijua Island and Dana Island

Source: Deposited list of geographical coordinates of Indonesian archipelagic baseline points based on the Government Regulation of the Republic of Indonesia

Spatially, Raijua is very close to Dana, which is part of the same archipelago in East Nusa Tenggara Province. It allows the legal relocation of the base point in accordance with Article 47 UNCLOS without affecting the continuity of the archipelagic baseline. Raijua is under the jurisdiction of the Sabu Raijua Regency and has an established legal and administrative status that allows the construction of surveillance posts or lighthouses as a symbol of Indonesian presence.

Considering these five criteria, the alternative island approach is not only a response to land loss, but also protects Indonesia's strategic and legal interests at sea. Furthermore, this approach enables the legal renewal of baselines without creating tensions under international law and the sustainable preservation of maritime border stability (Faccio, 2021; Vinata et al., 2023).

As an island country, Indonesia is not alone in facing the challenges of climate change for its maritime territories. Other island countries, such as the Philippines, the Maldives and Tuvalu, also face the risk of small islands becoming submerged, which is the starting point for the retreat of their maritime borders. However, there are some differences in the practical application of this approach by different nations.

The Philippines, which also apply the concept of *archipelagic baselines*, tend to keep the old baselines and rely on the legitimacy of their previous registration with the United Nations, with little effort to reflect actual geographical conditions (Soons, 1990). Meanwhile, the Maldives is proactively considering the construction of artificial islands as part of its strategy to cope with rising sea levels (Chen & Xu, 2022). Tuvalu has even taken innovative legal steps by digitizing the country's territories to defend territorial claims despite the disappearance of physical land (Gullett, 2018). By contrast, this study aims to identify replacement islands based on the principles of geographical proximity, physical stability and compliance with UNCLOS 1982 and national regulations (Government Regulation No. 37 of 2008; Vinata et al., 2023). This approach is strengthened by the application of *Resource-Based Theory* (Barney, 1991), which assesses geographic features as strategic resources that must have value and scarcity, are not easily replicable, and can be managed sustainably.

As far as the potential change of the maritime territory is concerned, base point relocation may affect the retreat of territorial sea boundaries, additional zones and the EEZ. For example, if Rondo Island is lost without replacement, Indonesia's maritime boundary at the western end would retreat, resulting in the loss of EEZ claims in strategic waters such as the Strait of Malacca (Soons, 1990; IPCC, 2023). On the other hand, the use of islands further out, such as Sabang Island or Raijua Island, has the potential to extend maritime territorial claims as long as it remains within the scope of UNCLOS Article 47(1)–(3) and does not raise objections from neighboring countries (UNCLOS, 1982). The addition of this spatial approach and the international comparison show that Indonesia's ground point management is not only administrative in nature, but also has significant geopolitical and legal consequences.

5. CONCLUSION

Global climate change, especially sea level rise, has caused shrinkage with the potential to sink of a number of Indonesia's outermost small islands that have been used as base points in the retreat of the archipelago's baseline. The loss of these islands not only has the potential to decrease Indonesia's maritime jurisdiction, but may also weaken the country's legal and sovereign claims to strategic maritime zones. The study concludes that the identification of replacement islands should be carefully based on five main criteria: (1) geographical proximity to the source island, (2) permanence and physical stability, (3) legal and undisputed legal status, (4) strategic and defense value, and (5) compliance with the provisions of UNCLOS 1982 and national regulations, such as Government Regulation No. 37 of 2008. 37 of 2008. Through a descriptive-explanatory approach reinforced by spatial analysis and qualitative assessment based on Resource-Based Theory (RBT), six potential replacement islands were identified in this study: Sabang as a potential replacement for Rondo, Sekanak Raya as a potential replacement for Nipa, Kawio as a potential replacement for Marore, Karatung as a potential replacement for Marampit, Raijua as a potential replacement for Dana, and Sea as a potential replacement for Setungang. The results show that these islands are not only geographically relevant, but also have geopolitical and legal added value for maintaining the integrity of Indonesia's maritime territory.

Furthermore, the study emphasizes that the strategy of relocating base points is not just an administrative measure, but part of a geopolitical and diplomatic policy that must be carried out in a legitimate, cooperative and measurable manner. With a base point management strategy based on spatial data, strategic resource theory and compliance with international law, Indonesia can ensure the legitimacy, continuity and sovereignty of its maritime areas amidst the threat of climate change.

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