Research Article

The Implication of Sea-level Rise Toward the Small Island Nation of Maldives: Legal Perspective

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ABSTRACT

Climate change has always been a major issue and a long discussion in the international community. One of the tangible manifestations of climate change is rising sea levels. Sea level rise also has a significant impact on small island countries or micro-countries which are geographically small and have very low land elevations. The impact of sea level rise will pose a threat that is quite dangerous for the existence of a small island nation like the Maldives. This article applies normative legal research methods using a conceptual approach, cases and regulations. This study aims to examine the implications of sea level rise on the Maldives perspective and provide options in the form of legal construction to solve this problem. This research found that The UNCLOS does not provide explicit reference against the sea-level rise effected by climate change. However, International community have been making progress to address this issue with a numbers of conferences. This study suggest that The Maldives government should have maximized the implementation of its laws and regulation to mitigate air space pollution coming from GHG Emission. The consistency of its implementation is the important key to mitigate the impact of this sea level rises.

Keywords: Implication; Sea-level Rise; Small Island; Maldives.

A. INTRODUCTION

Ice melting from land into the ocean, warming waters that expand, a slowing Gulf Stream, and sinking land all contribute to sea-level rise (Wadham, Hughes, & Rodrigues, 2011). Although a global phenomenon, the amount and speed of sea-level rise varies by location, even between the East and the West Coasts. It is commonly well known that the accumulation of Green House Gases (GHG) produced by anthropogenic fossil fuel combustion and change in land use on the atmosphere is the main cause of this catastrophe (IPCC 4th Assessment Report, 2007).

The fact that GHG is one of the main factors that contribute to a climate change of ocean is unsurprising. Global Warming generally holds the root for this type of catastrophe heating the oceans. Human activities and geological processes as part of natural phenomena also trigger sea level rise. Exploitation of groundwater extraction and unbalanced land use in recent decades, can lead to land subsidence. Absolute Sea level changes can occur due to these vertical ground movements (Stammer et.al,

2013). Some South Asian and South east Asian countries are experiencing sea level rises that are related to land subsidence events.

The oceans have the ability to absorb most of the heat resulting from GHG Emissions, despite the oceans have globally warmed, yet not in a uniform way (Harris, 2007). This warmed ocean has caused climate change by forcing species to move from their comfort habitat closer to the surface where they are more exposed to predators and fishing. In relation to sea-level rise, the absorption ability of CO^2 by the ocean leads to acidification which periodically harming corals and other species as this marine ecosystem can prevent the sinking land of certain part of state territory (McCreath, 2018).

This issue will cause damage to the territorial part of a country. The Maldives, as an archipelagic state, is currently on danger-level to the extent the sea-level rise could sink some of its inhabited islands. It should be mandatory for Maldives and, possibly, the other states to collectively adopt laws and regulation to adjust themselves in natural or human systems to in response to actual or expected climatic stimuli or their effects (McCreath, 2018). The relevant legal obligation to address this issue is enshrined in the United Nations Convention of The Law and The Sea 1982 (UNCLOS) Part XII which contain duties to protect and preserve marine environment. Articles 192, 194, 207 and 212 UNCLOS deals with the air pollution which is related to the mechanism of the GHG Emission and adoption of laws and regulations to mitigate them. The cooperation between states about the effective regulations should be fully implemented and not merely a blueprint on the table.

This issue is a challenge to the existence of international law in dealing with the impact caused by sea level rise on coastal countries, small islands, and possible atolls. The effect has the potential to have broad implications including maritime zones, resource access, human mobility, and resilience building. Sea Level Rise issue needs to be addressed with the construction of a policy in the future to deal with this threat.

This study is focusing to discuss about how the numbers of International legal instruments response to address the potential dangers of rising sea level against archipelagic state. Then Our research analyzes the implications of sea level rise might be potentially occurred towards small island nation, in this case Maldives. In response the potential risk due to climate change, this research will recommend several legal actions and solutions which would be useful to protect the existence of the Maldives from the worst effect of sea level rise.

During the time of conduct these study, the researcher found a number of scientific publications were indirectly correlated with our paper concerns but had different point of views and discussions. Firstly, the research conducted by David Freedstone, Davor Vidas and Alenjandra Torres Camprubi in 2016. This publication learned regarding the effects of sea level rise on maritime zone generally and suggested the urgency a new progressive

international law instruments on this concern (Freestone, Vidas, & Camprubi, 2016).

The second studies from Jason Chilver et.al it was discussed about public engagement with marine climate change issues. This paper examine the society responses and understanding against marine climate change (Chilver et.al, 2014).

The third research was conducted by Kelvin Mbatia in 2020. His article criticizes the implications of the rising sea level on the maritime boundaries, land territory and populations residing in small lowlying island national. The result of study was proposing the principle of *uti possidetis juris* as a *panacea* to the retention of statehood of small island nations threatened by sea level rise (Mbatia, 2020).

Next research which discussed related Sea level rises was published by Nobuo Mimura. The substances of study describe about the present status of observed sea level rise cause and future projections. The article was examined along with other consequences of climate change, from both global and Japanese perspectives (Mimura, 2013).

The fifth article which has tangent point with our paper indirectly was written by Ratu Gina Narnina and Arie Afriansyah (Narnina, & Afriansyah, 2019). Their study only elaborated regarding the probability in a shift of the baseline due to the inundation of the coastline used as a place to draw the baseline itself, resulting into the possibility of States losing juridical claims in its maritime zone.

B. RESEARCH METHODOLOGY

The current research has the basis on the impact of sea-level rise as the effect of climate change toward the small island instead the tiny island. In order to relate with the issue, the author try to highlight into Maldives Legal perspective. Specifically, the author utilizes the United Nations Convention of The Law and The Sea 1982 and other related regulations (especially international instruments such as convention) to elaborates and understands the impact of sea-level rise toward the impacted country such as Maldives and also study the offering solution instead durable solution. Besides, the author also uses the secondary sources data such as legal writings that have interpreted the primary sources, including books, scientific paper, working paper and journals accessible online.

C. RESULTS AND DISCUSSION

1. The implication of Sea-level Rise to the Small island of Maldives

Since the 1950s, sea-level within or near the territory of Maldives has been rising at a rate of 0.03–0.06 inches (0.8–1.6 mm) per year (McCreath, 2018). Because of the Maldivian topography, small changes in sea-level translate into extensive land inundation. This will likely be affecting the existence of statehood by which territorial border determined by Maldives whose baseline was already well-established in a specific point of the coasts.

The Maldives has an average elevation of 1.8 m above sea level and is the “flattest country

on Earth" (Union of Concerned Scientists, 2011). This small island nation in the southwest part of Peninsular India is made up of 1300 islands and is vulnerable to a lack of natural defenses against tidal fluctuations in ocean waves. The nation's capital, Male, is at great risk from rising sea levels as more development extends to the narrow coastline.

The city's defense relies on only limited options to minimize this risk, which is highly dependent on human ingenuity in designing building construction and the sustainable integrity of the tetrapod walls (Naylor, 2015). The existence of this infrastructure is a factor that has interrelated and very complex relationships for survival. However, this is a defense mechanism, offering a short-term "band aid" solution that only ameliorates the impact of a persistent tidal wave

The principles of stability and order in international law minimize the occurrence of a legal vacuum in protecting sovereignty. Legal scholars have written a lot about the processes of the formation of the state, as opposed to the extinction of the state or the termination of the state. Some territorial parts of a country or a number of countries can sink under water, become uninhabitable and pose new challenges (Aznar, 2012).The problem of rising sea levels was not paid much attention to by the international community, although a number of island countries in the form of small islands have warned of the dangers of this problem in the global political sphere.

The continuing sea-level rise is not impossible to cause decline of certain territory of islands belonging to Maldives. Furthermore, most inhabited islands have chance to sink or disappear causing population migration or environmental refugees at worst.

Regarding to the opinion of a number experts, there are three types of natural disasters caused by climate change causing climate change refugees: sea level rise, increased storm activity and strength, and drought, desertification, and water shortages. Climate change refugees becomes main issues by Organization of High Commissioner for Human Rights (OHCHR)'s concern since 2009. OHCHR states that the impact of climate change is potential migration caused by flooding, farm damage and pro- longed drought which affect human rights especially the right of life (Hall, & Weiss, 2012).Those who are classified being refugees who seeking a shelter in new country and cannot return to their original country because of the danger that threatens based on the principle of non-refoulement.

Refugees due to climate change have not been accommodated in international law regarding their legal protection. International refugees, as regulated in the 1951 Convention or the 1967 Protocol on refugees are not included as climate change refugees (Wartini, 2017). This is because at the time the draft Refugee Convention was made, the dangers of climate change causing refugees to move to other countries were not yet known.

The situation is increasingly adding to the new problems caused by sea level rise as part of the consequences of climate change. It needs to be responded and immediately carried out through a comprehensive legal instrument.

a. UNCLOS Perspective

The UNCLOS does not provide explicit reference concerning the sea-level rise caused by climate change. It considers merely incidentally particular aspect of climate in relation with the ocean. However, the provisions of Part XII of which protection and preservation of the marine environment is entitled, are implicitly relevant to address the sea-level rise caused by climate change (Bindoff et.al, 2007).

UNCLOS imposes general obligation to state parties under article 192 that stipulates "States have the obligation to protect and preserve the marine environment". UNCLOS further elaborate what proper measures to prevent, reduce and control pollution of the marine environment starting with adoption of government policy (art. 194(1)), classification of sources of pollution of the marine environment (art. 194(3)), and including rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life which is applicable to coastal ecosystems such as coral reefs, mangroves, sea grasses, salt marshes and other species affected by climate change (art. 194(5)).

Scientifically, these ecosystems provide key to effective protection to the coast. Mangroves and salt marshes are able to move landward with sea-level rise or may increase their vertical elevation through sedimentation. However landward movement is impossible when the coastline is affected by coastal squeeze (Schumm, & Guillux, 2016).

Professor Schofield also stated that the historical resilience of coral reefs are originally natural breakwaters, but their effectiveness varies by level of each coral cover. For instance, the absence of coral cover on reefs, offshore maximum and mean wave heights are reduced in the lagoons up to 9% and 21% (0.31 & 0.28 m). It is different when coral cover are present on reefs such as a dead reef transmits only up to 6% and 17% (0.24 & 0.23 m) of the incoming maximum and mean offshore wave heights, meanwhile a live reef may further reduce up to 0.4% and 12% (0.18 & 0.16 m) (Guannel et.al, 2016).

b. International Regime

The scientists have warned of climate change, global warming, and sea level rise over the past three decades. In its fifth report, the Intergovernmental Panel on Climate Change (IPCC) estimated sea level rise from 1986 to be between 26 and 82 centimeters (IPCC 5th Assessment Report, 2013). In the end of this century changes in regional sea level rise will impact low-lying coastal States, the consequences of such sea level rise will be catastrophic. It is estimated that a sea level rise of one meter will inundate an area currently inhabited by more than 60 million people (Arsana, & Schofield , 2012). A sea level rise of one meter will submerge about fifteen percent of Bangladesh

and displace more than seven million people in Bangladesh. Vietnam's Mekong delta region only (Busch, 2018).

Some low-lying areas that are not completely submerged may be subject to periodic flooding and experience extreme weather conditions, air intrusion as it will affect agricultural land and freshwater sources. Low water levels, coral reefs, rocks and islands can be flooded or damaged by erosion. Small island countries will disappear or all of their parts will be submerged due to sea level rise, even changes in coastlines will affect the shift in the location of sea boundaries.

International community have been making progress to address this issue by various attempts. The first ever event was held on November 1989 which is entitled Small States Conference on Sea-level Rise at Male, The Maldives consisted of 14 archipelagic states. The decision of that conference was to develop a program of action within the small states, for cooperation and exchange of information on strategies and policies in relation to climate change, global warming and sea-level rise which are common concerns of mankind resulting in Male Declaration on Global Warming and Sea-level Rise (Center For Tropical Coastal Management Studies University of Newcastle Conference Reports, 1989) .

In certain cases, changes in territorial boundaries are very vulnerable in certain countries which have an impact on the land area which is the basis of their existence. solve this problem. Marine law experts take advantage of the amendment. A number of scientists such as DD. Caron and AHA Soons were published their research on the effect of sea level rise on sea boundaries. The results of their studies show that different sea level delimitation laws are neither capable nor effective in dealing with sea level rise. This research also confirms that the law of the sea is not able to adapt to changes. So it is necessary to make changes, either by changing the LOSC rules, new technical agreements, or new customary law.

Furthermore, On April 2010, The Government of Maldives, the European Union (EU), and the World Bank Group signed a tripartite Memorandum of Understanding establishing a new Trust Fund designed to build resilience to climate change in the Maldives. The EU has contributed $8.8 million (approximately $7.92 million) to the multi-donor The Maldives Climate Change Trust Fund, which the World Bank will administer over a period of three and a half years. The majority of the Trust Fund resources will be utilized by the Government of Maldives to carry out their priority projects relating to climate change adaptation and mitigation (Naeem, 2013).

On March 2018, the Centre for International Law (CIL) at the National University of Singapore (NUS) hosted an international conference on Climate Change and the Law of the Sea with challenge to adapt the Law of the Sea to Address the Challenges of Climate Change. The objective of the conference was to

bring together leading legal and scientific experts to discuss the impacts of climate change on the marine environment and on uses of the sea and the challenges they pose to the law of the sea. The conference also aimed to examine how the law of the sea could be used both to respond to climate change impacts on the oceans and also to support mitigation and adaptation measures (Naeem, 2013).

2. Development and Adaptation of The Maldives Government to solve the issue

a. Legal Action and Multilateral Approach of Maldives Government to prevent the effect of the sea level rises

Efforts to prevent the extinction of the existence of a country by legal means in the face of changing geography it may be that the greatest risk for a country will result from the displacement of all, or most, of its population. This probably happened long before the island territories physically disappeared. The effects of sea level rise, already visible in some low-lying island states, it arise the potential to result in a sharp decline in island living conditions.

As a result, large-scale migration and relocation can occur. As outlined in the Johannesburg ILA Report, these may be primarily internal – within the state – at first and can then become largely external (McAdam, 2011).

The GHG emission is one of the main substances to cause a catastrophic climate change by creating greenhouse effect in the earth's atmosphere. Since GHG emission may transmits through the air space, article 212 UNCLOS should be the most suitable provision governing this issue as it obliged particular government of state adoption to laws and regulations to prevent, reduce, and control pollution of the marine environment through the atmosphere applicable to the air space under their sovereignty, including implementation or participation through international organizations or diplomatic conference.

However, conservation or preservation of marine ecosystems such as coral reefs, mangroves, and wetlands may be the first thing to come across mind when a state government wants to take care of this issue. Unfortunately, it is almost too late to develop these attempts as recommendation from conferences, resolutions, and policies are not in conformity with the current reality.

All attempts to mitigate the rising sea-level within the area of the tiny islands of Maldives are considered not effective because the pollution coming from GHG Emission is quick enough to harm the marine ecosystem rather than waiting for that ecosystem to self-develop and endure the sea-level rise. For instance, ocean acidification against coral reefs that is likely to slow their growth (McCreath, 2018).

Furthermore, multilateral approach seemingly not quite effective as well since industrial countries that mostly produce a huge amount of GHG Emission have not taken a cooperative intention to mitigate this issue. The United States plays the role as one of the major producer of GHG Emission with 5.41 gigatons in

the end of 2018. On top of that, the United States have not ratified the Kyoto Protocol by declaring a controversial statement. In July 1997, the Senate passed the Byrd–Hagel resolution, stating that "*the United States should not be a signatory to any protocol … which would (A) mandate new commitments to limit or reduce greenhouse gas emissions for the Annex I Parties, unless the protocol … **also mandates** new specific scheduled commitments … for **Developing Country Parties within the same compliance period**, or (B) result in serious harm to the economy of the United States*" (Senate Resolution 98, 1997) .

b. Indirect Movement

The international community has been developing alternative methods to slow down the sea-level rise by relying on several waste management approaches. First, neutral emission could be achieved by implementing framework within the Carbon Neutral Protocol to help industrial company achieve carbon neutrality and obtain carbon neutral certification. It can be used to certify a company under ISO 14067 or ISO 14064. The former mainly focuses to report and quantify the carbon footprint of a product and contributes to number 13 (climate action) of SDGs. The latter goes further and includes number 9 (industry, innovation, and infrastructure) aiming at reporting and quantifying an organization's GHG inventory. The GHG protocol may be utilized as a guideline to quantify carbon emissions (Natural Capital Partners, 2020).

Second, recycling as it has shown the most effective alternative compared to other waste management. Recycling is not merely classified into closed-loop systems but also consist open-loop recycling, and industrial symbiosis. Open-loop recycling occurs when recycled materials are used to create a brand new, different product, usually with a loss of material quality. Industrial symbiosis involves the exchange of resources including by-products among industrial companies of which may create 'recycling clusters' to provide shared resources. Case studies on industrial symbiosis in both developed and developing regions have shown measurable environmental and economic benefits with respect to water, air and waste (Chertow, & Lombardi, 2005).

c. Solution: Durable or Permanent

The legitimation of creating the artificial islands shrined on Article 60 (1) (a) UNCLOS that stated the coastal state has the exclusive right to create the artificial islands. The Maldives, however, has jurisdiction over its EEZ to establish the artificial islands concerning customs, fiscal, health, safety, and immigration laws and regulations. Recalling the potential of tangible catastrophe that may happen if the seawater continues to rise. Therefore, the construction of Maldives artificial island surrounding EEZ could be legally justified under UNCLOS.

Furthermore, evidence was found on the trilateral agreement between India, Sri Lanka, and Maldives concerning the Determination of Tri Junction Point in the Gulf of Mannar. The agreement emphasized the Maritime Boundary

that was measured by the latitude (04o 47.04" N) and longitude (77o 01.40" E). As such, the construction of the Maldives' artificial islands should respect the maritime boundary agreement between two other countries.

Bear in mind, the construction of the artificial island also should not jeopardize both living and non-living resources. In 2013, China's large-scale reclamation and artificial island construction in Spratlys and Paracel had caused environmental harm on coral reefs. The South China Sea Award states that these activities have caused permanent and severe harm to the offshore reefs environment and violated the legal obligation to preserve and protect fragile ecosystems and the habitat of depleted, threatened or endangered species after.

D. CONCLUSION

It is likely for the islands of Maldives to face the high rising sea-level causing its territory to sink or disappear at worst. This predicted situation will lead to migration of the Maldives population and the government of Maldives must find a new territory. However, the UNCLOS does not provide an explicit provision to, at least, mitigate the sea-level rise but rather implictly mitigate the harm or damage against the marine environment. Article 192 UNCLOS imposes duty for states to protect and preserve marine environment such as coral reefs because all these measures will slow down the sea-level rise although it is questionable whether reefs will be able to keep up with accelerated sea-level rise, compounded by ocean acidification. The international community had tried to resolve this issue by holding numerous conferences.

Beginning from the 1989 Small States Conference on Sea-level Rise at Male which discussed the most proper and effective policy between state parties, The 2010 Trust Fund MOU signed by EU, the World Bank Group, The Maldives, and the NUS International Conference on Climate Change and the Law of the Sea in order to examine potential utilization of the UNCLOS to cope both climate change and sea-level rise.

The Maldives government should have maximized the implementation of its laws and regulation to mitigate air space pollution coming from GHG Emission. The GHG Emission is one of the main substance to increase the level of global warming. Inconsistency of this implementation is one of the major drawbacks that cause all the aforementioned attempts seem not effective enough. Alternative management approaches have been developed to slow down the GHG Emission by relying on the Carbon Neutral Protocol and waste recycling. However, The Maldives is legally allowed to build an artificial island under Article 60 (1) (a) UNCLOS. Bear in mind, the construction of artificial island shall not harm both living and non-lliving resource in order to keep the environment balance.

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