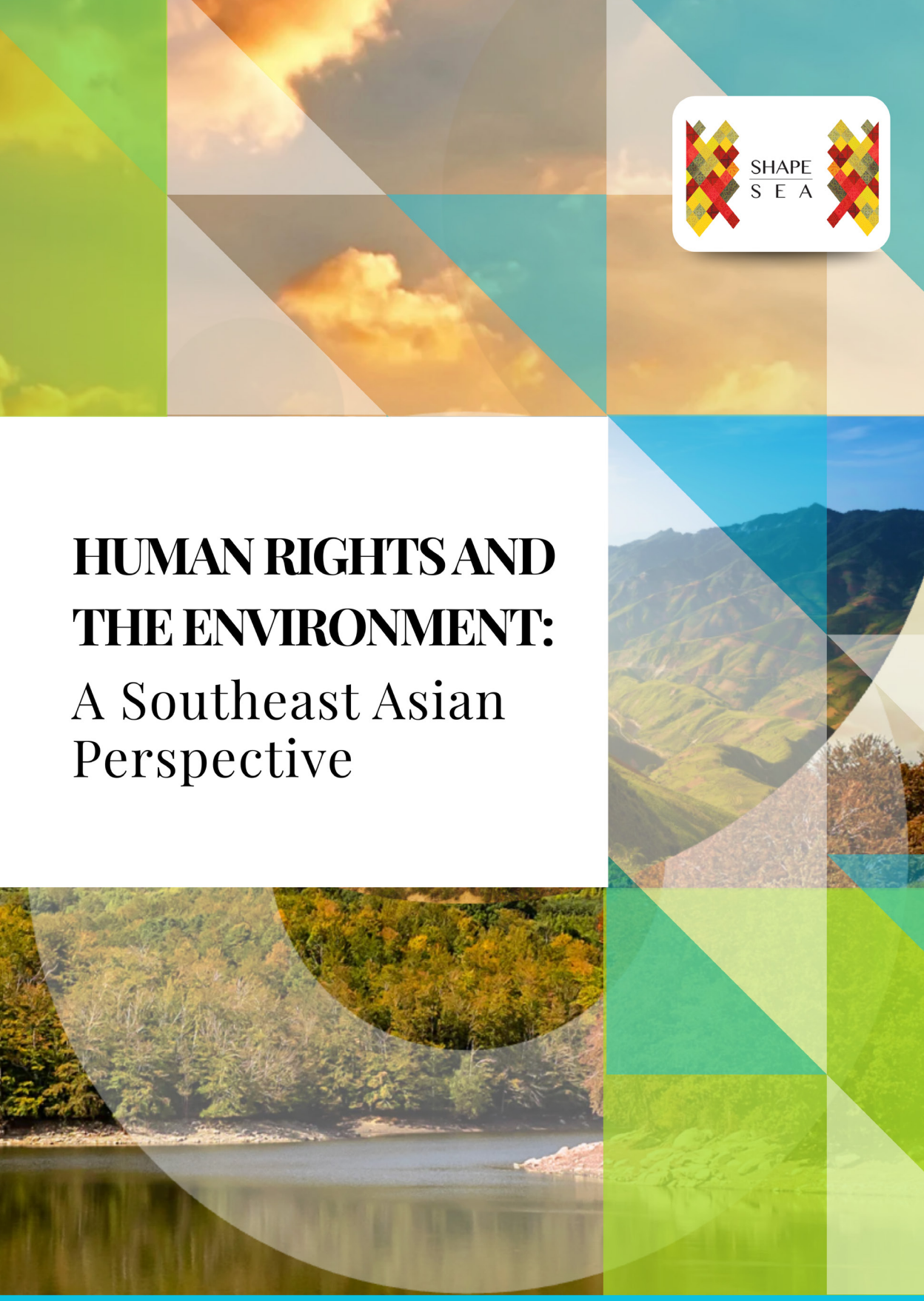
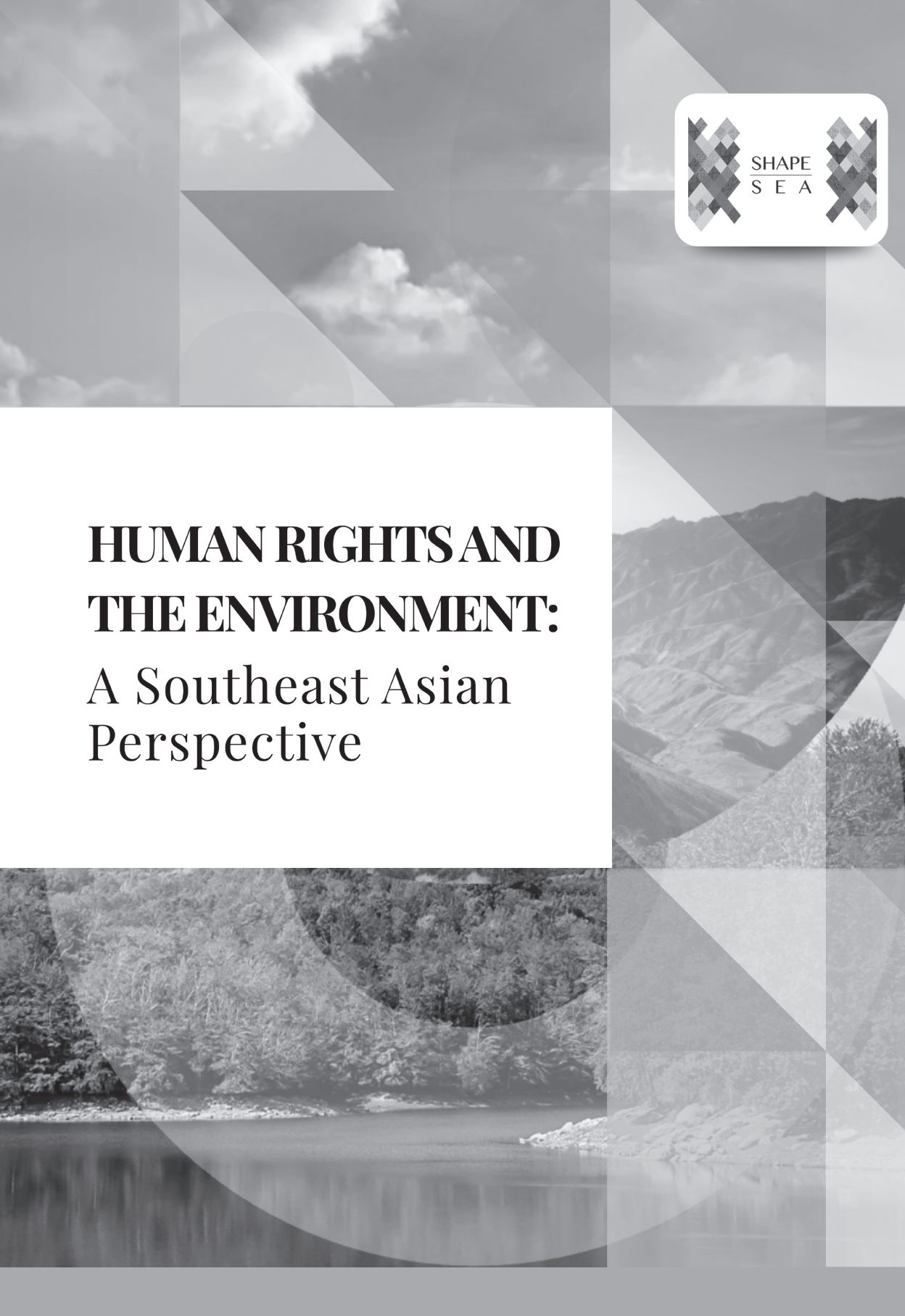


HUMAN RIGHTS AND THE ENVIRONMENT:

A Southeast Asian Perspective



HUMAN RIGHTS AND THE ENVIRONMENT:

A Southeast Asian Perspective

The Strengthening Human Rights and Peace Research and Education in ASEAN–Southeast Asia project (SHAPE-SEA) is a collaboration between two regional networks, the ASEAN University Network–Human Rights Education (AUN-HRE) and the Southeast Asian Human Rights Studies Network (SEAHRN). The programme is supported by the Swedish International Development Cooperation Agency (SIDA).

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Tel: (66) 2-441-0813–5
Fax: (66) 2-441-0872–3

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Dr. Azmi bin Sharom

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Alec Bamford

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Introduction

It can be argued that a right to a clean environment came to international prominence with the 1972 United Nations Conference on the Human Environment held in Sweden. Principle 1 of the Stockholm Declaration, which was the result of said conference, states:

> *"Man has the fundamental right to freedom, equality, and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations."*

Putting aside the outdated use of the term "man," this principle fundamentally establishes the right to a clean environment, not just for the current generation but also for future generations. This may be considered a given today, but in 1972, this was a novel concept indeed. So novel that many participants in the conference were adamant in adding what they considered to be the truly pressing matters of the day. Hence, Principle 1 begins with the sentence above but ends with the following:

> *"In this respect, policies promoting or perpetuating apartheid, racial segregation, discrimination, colonial and other forms of oppression and foreign domination stand condemned and must be eliminated."*

It can therefore be seen that the right to a clean environment did not get an easy start as a concept, as it was deemed, in Stockholm, almost secondary by some participant countries. There were many other criticisms about it as well. Its lack of pedigree and inherent caused some to view it as simply a "lightweight" right. While others criticised its vagueness, and thus the difficulty of enforcement. Even environmentalists were not too enamoured of this new right, as it was human-centric and, being chained to law, was burdened by the cumbersome machinery of the legal process.

Be that as it may, the concept slowly took hold. Environmental rights began to take shape and were recognized as both substantive and procedural rights. As a substantive right, i.e. an actual human right to a clean environment, although they were no binding international treaties that made it so, many countries started to incorporate it into their legal systems, either through constitutional amendments (indeed in many cases new constitutions) adding the right, or through the interpretation of the more traditional "right to life" as encompassing the right to a clean environment. Procedurally, the *locus standi* of organisations concerned with the environment became more widely accepted, and in

some countries, this right to bring proceedings against polluters and governments even extended across borders.

In 2026, fifty-four years after the 1972 Declaration, we can see just how developed the relationship between human rights and the environment has become in this publication, which is a result of the Commissioned Research Project initiated by the Strengthening Human Rights and Peace Research and Education in ASEAN/Southeast Asia Programme (SHAPE-SEA). When the call for research proposals was issued, the theme SHAPE-SEA was set to human rights and the environment. Through a rigorous selection process, eight research projects were chosen, and the researchers' work did not disappoint.

The chapters you find here reflect the myriad subtleties and nuances when exploring human rights and the environment in all its varied aspects in the 21st century. One key element, which was probably not even considered in 1972, is gender. This chapter looks at a case in Indonesia, while "Unheard Local Champion: Indigenous Women and Ancestral Land Protection Against Lower Sesan II Hydropower" examines a situation in Cambodia. These two chapters make excellent companion pieces, as the reader experiences two different countries from the perspective of not just gender but also indigenous rights.

Wengki Ariando's "Knowledge and Rights in Transition: Post Sedentarized Orang Suku Laut in Accessing Resources in the Anthropocene" studies the problems faced by a community that had to change their way of life and is so well researched that it is valuable not just as a paper on human rights but also for anthropology in general. Another chapter with admirable depth of research is Lorena L. Sabino and Fritzielyn Q. Palmiery's chapter entitled "Pathways to Climate Justice: Voices from Farming Communities in Koronadal City, Mindanao, Philippines. Their chapter on the effects of climate change and the pragmatic ways forward to protect the farming community is complemented by Noe John Joseph E. Sacremento's contribution. Titled "What do the Non-Economic Impact of Climate Change Loss and Damage Reveal about Human Rights and the Sea-Level Rise in the Philippines?", it invites the reader to consider the limitations of viewing loss and compensation purely in monetary terms.

The final three chapters do not have companion pieces as such, but they are valuable in their own right. Ratna Juwita examines the relationship between corruption and environmental rights throughout Southeast Asia in her chapter "Corruption and the Realization of the Right to a Healthy Environment in ASEAN: Exploring the Connection". Norafidah Ismail illustrates how the non-glamorous topics of bureaucracy and efficient administration are key to protecting human rights during disasters in her chapter "Human Rights and Flood Disaster Management in Malaysia: A Study of Baling, Kedah". And finally Ratnaria Wahid embraces the advantages and challenges posed by technology in the chapter "Safeguarding Rights and Sustainability: Human Rights Implications of Big Data Technologies inEnvironmental Monitoring".

The purpose of the commissioned research project is to encourage Southeast Asian researchers to pursue their interests with institutional and financial support. SHAPE-SEA would like to thank all the researchers for their hard work and patience in helping us meet this purpose. It is clear from the quality of the work on display here that their future is bright, as is their future in research on human rights and the environment.

SHAPE-Sea would like to acknowledge and thank our funders, the Swedish International Development Cooperation Agency (SIDA).

Azmi Sharom

10 February 2026

CHAPTER 1

Knowledge and Rights in Transition: Post-Sedentarized Orang Suku Laut in Accessing Resources in the Anthropocene

Wengki Ariando[1]

Abstract

As a maritime-oriented culture community, the Orang Suku Laut (OSL) have deep knowledge of marine ecosystems and have developed sustainable cultural, fisheries, and coastal ecosystem management practices. However, in the context of intensive and exploitative national development plans for coastal and small island resources, their existence is increasingly marginalized at various levels. This research analyzes how the development process in Indonesia has affected the livelihood and culture of the OSL in the Lingga Regency post-sedentarization. This chapter focuses on the marginalization the OSL experience, both in terms of access to natural resources, legal recognition, and participation in decision-making. In the Anthropocene context, shifting power dynamics and rapid social and environmental changes contribute to the knowledge and rights transition of OSL. The development discourses in the Lingga Regency have led to marine appropriation, which takes away the basic rights of OSL. There is an important need for more effective and equitable policies and programs that support the rights, livelihoods, and cultural integrity of these unique and vulnerable communities .

Keyword: Orang Suku Laut, OSL, knowledge, rights, Anthropocene, post-sedentarized

[1] Center of Excellence on Migration and Development, Asian Research Center for Migration, Institute of Asian Studies, Chulalongkorn University; KITLV- Royal Netherlands Institute of Southeast Asian and Caribbean Studies
Corresponding author: wengkiariando@yahoo.com

Introduction

The way of life of sea nomads in Southeast Asia revolves around maritime culture, where they traditionally hunt and gather marine resources during specific seasons. Although they were once a nomadic culture, they have now established settlements along the Southeast Asian coast and on small islands (Andaya, 2019; Ariando, 2024; Chou, 2010). Even though they are now sedentarized customary communities, their nomadic mentality remains. Based on linguistic analysis, the sea nomads are divided into three categories: Moken-Moklen in Myanmar and Thailand, Orang Laut in Thailand, Malaysia, and Indonesia, and Sama-Bajau in the Philippines, Malaysia, and Indonesia (Bellina et al., 2021; Sopher, 1965). They are still considered second-class societies (Ariando, 2021; Arunotai, 2017; Chou, 2016; Low, 2022) and are not included in the definition of Indigenous peoples (Ariando, Manan, et al., 2023; Roxas-Lim, 2017) because the unexclusive notion of 'ancestral domains' refers only to a land-based definition.

This research is framed within the context of the Anthropocene, which acknowledges the significant and lasting impact of human activities on the earth's systems (Braje, 2015; Steffen et al., 2016). These activities have fundamentally altered environmental conditions and the availability of resources. This epoch requires a critical examination of how human-induced ecological changes intersect with the knowledge systems and rights of marginalized communities (Dovchin et al., 2023), such as the post-sedentarized sea nomads. When considering the challenges sea nomads face in the context of Anthropocene discussions, it becomes clear that they occupy a marginalized position. They are dealing with the effects of unsustainable coastal development to varying degrees. Overdevelopment poses significant threats to the coastal environments they rely on (Ariando, Veda Santiaji, et al., 2023; Zal et al., 2025), leading to the destruction of crucial habitats such as mangroves and coral reefs. Such destruction disrupts the fragile balance of the coastal ecosystems vital to their way of life. Furthermore, the lack of comprehensive and integrated coastal zone management plans exacerbates these negative effects, rendering coastal areas increasingly vulnerable to erosion, storm surges, and other hazards for the sea nomads. Socially, these developments undermine the basic rights of sea nomads, fostering unstable human-environment relations and contributing to the loss of their livelihoods.

One sea nomad group is the Orang Suku Laut (OSL), a customary community of the Malay group in the Lingga Regency, Riau Islands Province, Indonesia. The OSL are known as a second class society because they are labeled as believers in black magic, poor, uneducated, dark skinned, and smelly (Chou, 2003). Their relationship with the dominant Malay community was not only based on trade needs, they were considered to have contributed to protecting the sea during the Riau-Lingga-Johor Sultanate (Andaya, 2019; Lapian, 2009), but currently in the post- sedentarization, the OSL often find themselves in a dependent patron-client relationship. In this situation, they are usually treated as a means for island residents to gain economic advantages (Barnard, 2007). In the New Order era of Indonesia, the OSL were forced by the government to end their nomadic lives and settle down in government-provided houses (Lenhart, 1997). The government forces them to stay in one place around an island or the place where they want

to build the houses as long as it is located close to the mainland. This initiative created new development problems in various aspects: social, environmental, and economic. As a result, the OSL are struggling with losing local knowledge and environmental problems, even though they have the adaptive capacity to use what remains of their local knowledge in dealing with climate change (Ariando & Limjirakan, 2019; Firdaus et al., 2019).

This chapter investigates the multifaceted challenges faced by OSL communities in navigating contemporary development pressures in insular Southeast Asia. Specifically, it examines: (1) the current constraints and limitations that OSL communities encounter in accessing and utilizing traditional marine resources; (2) the diverse coping mechanisms employed by OSL communities to adapt to the socio-economic and environmental changes associated with sedentarization and the erosion of their maritime identity; and (3) the dynamics and effectiveness of institutional efforts aimed at supporting OSL communities in the post-sedentarization and post-recognition era, including government policies, conservation initiatives, and community-based programs.

Orang Suku Laut in the Lingga Regency

Orang Suku Laut (translated as '*sea tribe people*'), or sea people, refers to sea nomads, characterized by their rich maritime culture and hunter-gatherer livelihood. The English-language literature has introduced alternative terms, including sea folk, sea hunters and gatherers, sea nomads, sea foragers, sea gypsies, boat people, and people of the sea (Chou, 2010; Sopher, 1965). Despite these different labels, the term *Orang Suku Laut* or *Orang Suku* remains the most widely accepted among the Malays of the Riau Islands, including those from the mainland. Those alternative names are exonyms. The OSL view themselves as the original Malays (*Melayu Asli*), distinguishing them from the coastal Malays, whom they refer to as Malay traders due to their historical aristocratic status (Chou & Wee, 2002). They identify themselves as Orang Asli followed by their location/home) - their endonym, such as *Orang Asli Mapur, Orang Asli Galang, Orang Asli Kelumu*, etc. The term 'Orang Asli' among the OSL is different in meaning from 'Orang Asli' in Malaysia, which means '*Bumi Putera*' or 'indigenous people'. In Malaysia, the OSL are referred to as the Orang Asli Laut, divided into four distinct subgroups: the Orang Kuala, Orang Seletar, Orang Kanaq, and Mah Meri (Zal et al., 2025).

In the Riau Islands, the OSL are often called tribal people (*Orang Pesukuan*), segmented into multiple *suku* (tribes) (Anderbeck, 2012; Sopher, 1965). Historically, *Orang Pesukuan* were subjects of the sultan of the Riau-Lingga-Johor Kingdom, which split into two in the 19th century: *Orang Darat* and *Orang Laut*. Today, many of these communities abandoned their original nomadic lifestyles in the late 1980s and have sedentarized. OSL communities are characterized as ethnic groups who traditionally lived on house boats (*sampan kajang*) in the waters of Riau Islands Province and along the coast of South Johor (Chou, 2010; Sopher, 1965). In other maritime regions, the OSL groups are located in the southern part of Thailand in Phuket, Krabi, and Satun provinces (Arunotai, 2017). In Malaysia, they are in Johor Bahru and along the Malay Peninsula (Binti Abdullah et

al., 2018). In Singapore, a remaining OSL culture can be found on the south coast of Singapore on Semakau and Seking islands (Low, 2022; Wee & Benjamin, 2001).

The Lingga Regency, Riau Islands Province, Indonesia, has most OSL communities in Southeast Asia, with 30 OSL villages of around 4000 people living in the sea, on islands, and along the coasts, with some groups still residing in *sampan kajang*[2]. The OSL generally move from the small islands and enter the channels among the mangrove forests. Mangroves are essential for the OSL because they are considered the home of sacred animals (Ariando, 2018). There are no marine protected areas or other protected areas in the Lingga Regency; the only limited production forest areas consists mainly of a few mangrove forest areas. Additionally, there are about 15 locations where charcoal is produced using mangrove wood, with the OSL employed as labor, called *dapur arang* or *panglong*[3]. As part of efforts of the Lingga Regency government to promote community empowerment for the OSL, local decree No. 4/2022 on an OSL empowerment initiative was issued. One of the initiatives under this decree was to provide new settlements starting from January 2023. The implementation of this regulation is currently being debated in the local context.

The sea for the OLS is not only an economic resource but also a space for beliefs, a home as a secure place to live and raise children, and knowledge to be passed to the next generation. However, post-sedentarization, the OSL have been transformed with a new face and agency. They face oppression from governance systems that do not prioritize their interests and needs, particularly concerning the environment and marine resource. Their right to nurture nature is slowly evaporating, along with their traditional ecological knowledge (Ariando & Limjirakan, 2019). On the other hand, state-centric development has resulted in the loss of fishing grounds and access to land as their nomadic rights and territories have been appropriated for national development projects. The OSL can no longer access sacred areas or fishing grounds. This affects their communal rights to access natural resources. These are problems of environmental justice and political ecology dynamics, which do not position sea nomads as subjects but predominantly as objects in the development discourse.

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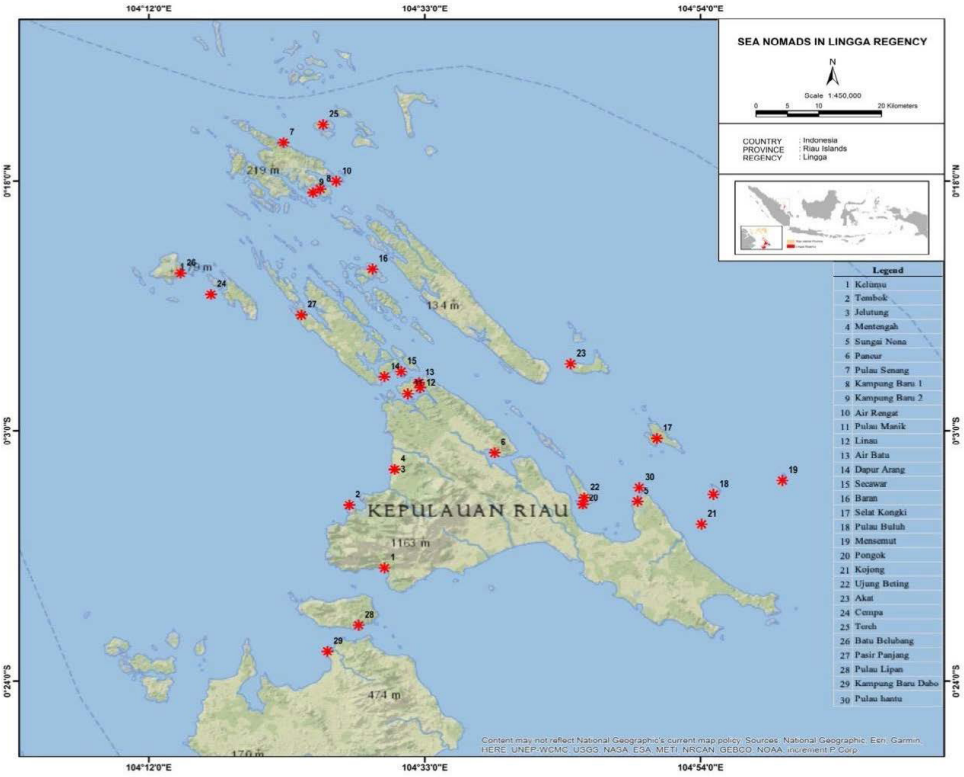
[2] The *sampan kajang* is the traditional boathouse of the OSL

[3] *Dapur arang* literally translates as 'kitchen' (*dapur*) and 'charcoal' (*arang*); in the local Malay language, this is called *panglong*

Figure 1

Orang Suku Laut in the Lingga Regency



Note. Ariando & Limjirakan, 2019.

This research employed long-ethnographic research from September 2018 to December 2024. The researcher has good resource mobilization for the OSL in the Lingga Regency and is well-versed in related development concerns. To get updated data, fieldwork was conducted in June – July 2024 in 15 selected villages: Kelumu, Mentengah, Jelutung, Tembok, Linau, Air Batu, Secawar, Kampung Baru 1 (Air Bingkai), Kampung Baru 2, Pulau Lipan, Air Ringat (Pulau Mengkuang), Kampung Baru Dabo (Sungai Buluh), Pancur, Selat Kongki, and Kojong.

In the recent fieldwork, the research employed key informant interviews, and non-participant observation. The key informant interviews were conducted to obtain comprehensive information on mapping current issues and coping strategies for the OSL in accessing natural resources and institutional efforts from related stakeholders. The informants were selected using a purposive sampling method, a non-probability form of sampling that aims to strategically sample the cases or participants and is relevant to the research questions (Bryman, 2012). The list of key informants and question guidelines for key informant interviews are given in Table 1..

Table 1. Key informant interview questions and population

Informant	Question Guidelines	Number (n)
Orang Suku Laut	1. Community background and demographic data of OSL. 2. Thematic questions based on the research framework. • Current problems. • Coping strategies and knowledge. • Other related issues (such as conflicts, climate change impacts, etc.). 3. Policy and development in accessing natural resources. 4. Community expectations regarding resource governance.	17
NGOs	1. Projects/programs related to the OSL. 2. Framing the development issues of the OSL and the potential. 3. Local knowledge of OSL for prospective co-management.	2
Academics	1. Projects/programs related to the OSL. 2. Framing the development issues of the OSL and the potential.	3
Private Sector	1. Projects/programs related to the OSL. 2. Framing the development issues of the OSL and the potential.	1
Government Officials	1. Projects/programs related to the OSL. 2. Current development policies related to the OSL. 3. Expectations of OSL resource governance.	2

Orang Suku Laut Well-Being in the Anthropocene

Along the east coasts of Sumatra Island, especially in Riau Islands, Riau, Jambi, Bangka Belitung and South Sumatra provinces, OSL populations have acquired or retained a marine nomadic lifestyle, a way of life that can be traced back into prehistory. Historically, their nomadic lifestyle encompassed diverse forms of movement and varying degrees of control over their mobility. However, post-sedentarization, these patterns of movement have evolved and adapted, leading to the development of new types of livelihoods. At the present time, their nomadic territory shows the degree of fluidity and commonality of the sea as part of traditional knowledge governing ecosystems, mutual decision-making in a community network, and goal-oriented communal settings (usually community-based protected areas). The OSL typically have social norms or informal governance systems that regulate the use of common resources, preventing overuse.

Reviewing the existing academic literature reveals several promising avenues for understanding the experiences of the OSL within the context of the Anthropocene. Similar to studies examining marginalized populations and environmental vulnerabilities in mainland Southeast Asia, current research has often highlighted the increasing efforts of national governments to exert control over these communities, particularly the pressure to transition from a nomadic way of life to a settled land-based existence (Andaya, 2019; Prawirosusanto, 2015; Zal et al., 2025). Despite their shift towards a more sedentary lifestyle, the OSL continue to preserve their distinctive nomadic culture and way of life in a new form and facing new challenges. This research argues that the traditional nomadic lifestyle of the OSL, along with their associated sacred ecology, served as an effective strategy for managing common resources, as outlined in Ostrom's framework (1990). The inherent mobility of a nomadic existence allowed them to spread the pressure on specific ecosystems and natural resources over a wider area, preventing overexploitation of any single location. This dynamic is illustrated by the ongoing practice of *Bakelam*[4] among the OSL, which is not only an economic activity but also a deeply rooted spiritual and mental necessity (Suhardiman et al., 2025). This indicates that their traditional mobility patterns and ecological beliefs have fostered a system of resource management based on cultural values and practices, contributing to the long-term sustainability of their shared environment. By traversing the landscape and maintaining a spiritual connection, the OSL effectively regulated resource use and upheld ecological balance, demonstrating a form of community-based governance of the commons.

An informant from Kampung Tajur Biru, Poase (male, 50 years old) explained:

> *"going to Bakelam gives us peace, because if we are at home, there are always social problems and it makes us stressed, whereas if we go to Bakelam, we are happy (free), get less stress and have a lot of time with our family, live in a sufficiency economy and reminisce with stories from our ancestors when we revisit our nomadic territories".*

The places the OSL visited have an emotional cultural bond with their identity and history. This illustrates that the OSL nomadic lifestyle is not focused on one location or resources in one ecosystem unit, which can contribute to the community's adaptive capacity and sustainable practice in broader mainstream conservation and development contexts.

The well-being and livelihood of the OSL reflect alternative values and traditions with respect to nature, including their pluralist law-making and decision-making capacity. This can be seen in the degree of agency systems when living in *sampan kajang* and permanent houses as in the present. When doing *Bakelam* with *sampan kajang*, the OSL have a stronger sense of connection to nature, and they practice asking permission from the sea spirit as their protector and main guidance (Suhardiman et al., 2025). They will also

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[4] *Bakelam* is a nomadic tradition of moving from one fishing ground to another. During *Bakelam*, the OSL treat the sea as the core territory and indirectly influence sustainable fishing practices. Currently, *Bakelam* practices are at risk of extinction and are witnessing a decline in participation, reduced area coverage, and shorter duration. The historical connections to past practices underscore the significance of *Bakelam* within the OSL, emphasizing the urgent need for action to preserve these traditions and territories.

obey *Pantang Larang* (taboos) as their customary laws. At the same time, they are required to make decisions to give directions, determine daily activities, choose what fishing gear will be used in their fishing area, or make other sudden decisions.

The transition from a nomadic maritime existence to settled communities among the OSL is frequently accompanied by significant alterations in their fishing practices. Their fishing grounds, once expansive and aligned with traditional patterns of mobility, become spatially constrained to areas accessible by small rowing boats or within walking distance of their settlements, encompassing practices such as *Bekarang*[5] and *Nyuloh*[6]. Historically, their nomadic way of life facilitated fishing across a diverse array of marine environments to fulfill immediate subsistence needs, informed by cyclical movements and an intricate ecological understanding. However, sedentarization typically results in geographically restricted fishing activities, primarily focused on localized subsistence to meet daily nutritional requirements. Concurrently, there is an increasing trend towards fishing driven by economic imperatives, influenced by the exigencies and opportunities associated with a sedentary lifestyle and integration into market economies. This transformation has the potential to disrupt established sustainable fishing practices and elevate the risk of localized resource depletion, as the broader ecological management inherent in their nomadic traditions diminishes within a fixed territorial context.

Furthermore, this research looks at the existence of OSL as affected by development that threatens their lives. Those threats are caused not only by external factors but also internal.

One informant from Kojong Island, Koas (male, 43-year-old) said:

"The sea has changed, [so] our home has too, because the source of life is the sea. If the sea is damaged by the aging of the earth or human activities, how do we want to survive? This is what is called a disaster for the OSL and its future generations".

This means that the OSL are aware of changes in nature due to damage that can be caused by many factors including anthropogenic activities. The term 'slow on-set disaster' is a concept introduced to frame the concept. For them, slow-onset disasters associated with climate change pose significant threats to their livelihoods, cultures, and their very existence. Disaster is interpreted not only as a physical threat but also as a cultural one. of, A ccording to the OSL, COVID-19 at the time was also said to be a minor disaster because of economic pressure and regulations that limited their mobility and contact with islanders. However, on the one hand, they were glad because during COVID-19, they could reflect on their ancestors who had carried out social distancing from other communities. They had to retain some traditional medications and physical activities to boost their immune systems and combat COVID-19. For them, the sea represents their living spirit,

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[5] *Bekarang* – the OSL tradition of foraging for marine creatures during low tide by walking along the shallow coastline in the day.

[6] Nyuluh - the OSL tradition of for foraging marine creatures during low tide by walking or rowing a small boat along the shallow coastline in the evening.

as it still provides resources for survival in all situations. However, they faced difficulties only in selling their fishing catch. However, , according to them, during COVID-19, their subsistence needs were secure. Interestingly, the major disaster they considered was the destruction of fishing areas by commercial fishing (such as the *Kelong*[7] practice) or the destruction of coastal resources by extractive development projects. The OSL stated that this disaster of resource scarcity was slow onset but could be articulated as cultural genocide for people who depend on marine resources for their livelihoods.

This research adds to the discussion on the circumstance beyond climate change, where the OSL face pressures from resource depletion and environmental degradation. Overfishing, driven by both industrial and artisanal fisheries (of mainland fishers), depletes fish stocks, impacting their food security and livelihoods.

Dri (male, 39 years-old) from Mensemut Island, explained:

> *"in addition to the difficult marine livelihood due to environmental changes, the OSL [must] compete with fishermen who have large capital and modern technology, especially those who have Kelong. The juvenile fish are now all gone into the Kelong net. They (capital owners) install the Kelong in our fishing grounds, even at the entrance to fish outside the island. They do not respect our sea".*

This situation illustrates how economic pressures and competition for coastal and marine resources can negatively impact the well-being and livelihoods of ocean-dependent communities such the OSL. Similar issues are also evident among other sea nomads across Southeast Asia, some of whom have been involved in conflicts and criminal activities (Ariando, Manan, et al., 2023; Lagarde, 2024). One interesting incident from Kojong Island regarding this situation concerns mainland fishers who dumped used zinc in the squid fishing ground, also considered OSL's sacred area. The OSL believe that a sea spirit lives there. A mainland fisher spoke rudely and showed disrespect towards the marine environment. According to the OSL, the mainland fisher will eventually receive a warning from the sea spirit, and after a few months, the rude mainland fisher died suddenly. In the context of the Anthropocene, this kind of relationship offers valuable insights into how we can foster a more harmonious relationship with the marine environment. For the OSL, the sea is not merely a source of sustenance, but a sacred realm inhabited by spirits and ancestors. This spiritual connection fosters a deep respect for the marine environment and its resources. The Anthropocene challenges the anthropocentric worldview that places humans at the center of existence, instead recognizing all living beings' intrinsic value and agency, including non-human entities like the sea.

Framing this research within the critical discourse of the Anthropocene and post-humanism provides an important lens for understanding the evolving vulnerabilities of the OSL. The Anthropocene, recognized as a geological epoch, highlights the profound and widespread impact of human actions on planetary systems, which fundamentally reshape environmental baselines. At the same time, a post-humanist perspective challenges

[7] Kelong is fixed/floating fishing platform with guide nets and lights to catch small fish in the evening.

traditional human-centered frameworks that prioritize human exceptionalism, advocating for the recognition of the intrinsic value and agency of the broader ecological web, which includes non-human entities and environmental processes. This research aligns with these discussions by illustrating the direct and significant impact of Anthropocene-driven environmental changes on the livelihood transformations experienced by the OSL.

To elaborate, the escalating effects of climate change present tangible threats to the OSL's traditional ways of life. For instance, the rising sea levels worsen coastal erosion, directly jeopardizing the islands and shorelines that have historically served as their homes and fishing grounds. Moreover, the increasing frequency and intensity of storms, a well-documented consequence of climate change, lead to the flooding of coastal areas, damaging essential infrastructure such as homes and fishing equipment. Research conducted by Ariando and Limjirakan (2019) further emphasizes the critical role of traditional ecological knowledge in addressing these challenges. Their work highlights the remarkable resilience displayed by the OSL in the Lingga Regency in the face of environmental adversity. However, they also point out the growing complexities of climate change, which require enhanced support from governmental bodies and the international community to strengthen the OSL's adaptive capacities and protect their livelihoods in this rapidly changing environment. This integrated perspective, informed by the frameworks of the Anthropocene and post-humanism, allows for a more nuanced understanding of the interconnected vulnerabilities and potential pathways for supporting these communities.

The next concern is the increasing experience of OSL with extreme weather events. According to the OSL, the growing frequency and intensity of tropical cyclones (*taong*[8]), are increasingly unpredictable. Ariando and Limjirakan (2019), in their previous research, identified the knowledge of the OSL on climate change; they know climate change as livelihood change where resources are depleted due to humans' lack of respect for nature. At the same time, their situational knowledge makes them vulnerable to the climate crisis. This can be seen in Jelutung, Mentangah, and Tembok, where the OSL villages are increasingly inland towards the mangroves. According to the OSL in these villages, the stilt houses were built in the channels and mangrove forests with the aim of protecting them from storm surges and other hydrometeorological disasters. This is also confirmed by the village government; the OSL build in this area because it is more durable than in the littoral areas and so reduces the housing assistance process. It further jeopardizes the safety of the OSL and the form of forced adaptation that they carry out. In this context, it is not only local knowledge but also intervention from local policies in housing them. If hydrometeorological disasters increase, it will threaten the livelihood of the OSL. Marine resources become scarce, while access to land resources is also limited for them. As traditional habitats become increasingly uninhabitable due to these

[8] A taong is a tropical cyclone that typically occurs between July and September, driven by winds from the Selatan to Barat Laut. In Selat Kongki, the most recent taong event occurred in August 2023, devastating three houses when it struck their village at 4 am. In Linau, taong generally occur in July, with significant impacts noted in 2008, 2009, 2013, and 2023. In Tajur Biru, the most severe cyclone happened in August 2024, destroying five houses at 6:30 pm.

environmental changes, the OSL may be displaced to urban areas, compromising their cultural identity and traditional lifestyles. This phenomenon is evident in locations such as Batam and Karimun islands, Riau Islands Province, where coastal areas have been transformed into sites of significant pollution and waste accumulation. The OSL become beggars or waste collectors.

Marginalization and Coastal Grabbing

In the Anthropocene era, the well-being and ecological reflectivity of the OSL are missing in the state-centric governance system. The traditional system governing the commons of coastal and small island resources is still considered as something left behind. Ironically, state-centric coastal resources governance often leads to issues of resource grabbing and marginalization. At the community level, such development appears to be a natural resource conflict, and it occurs in almost all strategic areas of Indonesian development (Asruddin & Efendi, 2024; Ferrol-Schulte et al., 2015; Gellert, 2010), especially under the umbrella of the National Strategic Projects or PSNs. Reflecting on the OSL and their peripheral role in development, many OSL communities still lack access to essential services like healthcare, education, clean water, and sanitation due to their remote geographical area and mobility (Ariando, 2018). Their access to fundamental rights will deteriorate with that kind of development and hinder their development and integration into mainstream society.

Particularly in the Riau Islands Province, the PSNs marginalize thepeople. Two of the total five PSNs in the Riau Islands have problems with the OSL. The development program and model centralize large strategic projects that the national government controls. This program indeed ignores the traditional knowledge, livelihoods, and well-being of the OSL. even though the OSL are one of the oldest customary communities in the Riau Archipelago. Extractive coastal development is not new, but it became more prominent during President Joko Widodo's regime from 2014 to 2024. There is often popular unrest at the grassroots level, but the issue does not come up in national discussions and concerns. Those who are considered stumbling blocks to the national agenda will be criminalized.

An example is the Rempang Eco City PSN in Batam. Since 2023, this project has been controversial because it is still publicized even though the local community rejects it. The investor has already signed up to conduct business in this region. Through the Batam Free Trade Zone and Free Port Management Agency, the national government plans to relocate 16 villages in Rempang to allow the construction of Rempang Eco City. This rigid plan has sparked strong protests from locals, including the OSL in Caros village. The OSL will lose their homes, livelihoods, cultural spaces, and access to the coastal and marine resources. The OSL historically have a close relationship with the coastal areas and islands in Rempang. They have inhabited and managed the area for generations, but their rights are often not legally recognized. Some old documentation about the Batam Islands states that the OSL moved around the straits and waters, building temporary shelters at various locations.

Figure 2

New house construction

Note. Tanjung Kelit, July 2024. Source: Author.

Although the Lingga Regency already has Regional Regulation (*Perda*) Number 4 of 2022 concerning the Empowerment of OSL Communities, the only focus is on infrastructure development, even though the *Perda* mandates community development including education, poverty reduction, and other socio-economic and environment issues. As a follow-up to the *Perda*, of 200 new OSL houses were constructed in the Lingga Regency beginning in early 2023 and were handed over to OSL in January 2024. The housing is scattered across eight locations in the Lingga Regency, including Air Ingat-Desa Baran, Mentengah, Selat Kongki-Penaah, Tajur Biru, Temiang Lingga, Pasir Panjang, Secawar-Tanjung Kelit, and Kentar Akat. There have been setbacks in the construction process due to deviations from the initial design and the fact that the construction workers hired by the housing developer came for only a week and then never returned to finish their work.

The construction of the OSL houses was built using IDR 7 billion sourced from the FY 2023 local budget of Riau Islands Province, each house costing IDR 35 million. Claims regarding project transparency and inadequate engagement with the OSL have tarnished this initiative. According to the OSL community in Selat Kongki, these new houses are not based on their traditional knowledge and are more fragile than the old houses. During the construction process, the OSL noted that work was often paused due to four changes of workers. Eventually, because the OSL community needed houses to live in, they collaborated (*gotong royong*) without relying on government-paid workers. The same thing also happened in Tajur Biru, according to the OSL there. The houses are very fragile, because the walls are made of low-quality synthetic materials (glass fiber reinforced concrete), compared to the previous houses which used a number of wooden planks.

Another issue related to the marginalization of the OSL is the loss of cultural practices and beliefs caused by the influence of the dominant religions of Islam and Christianity. Cultural practice and belief loss are critical aspects of cultural marginalization as they impede the transmission of traditional knowledge and values to younger generations. In addition, imposing dominant cultural norms and values can reduce traditional practices, rituals, and belief systems. Presently, the dominant religions are a significant concern to the OSL, as their traditional way of life has gradually evolved due to their adherence to recognized religions. The dominant religious organization offer assistance and community empowerment aid that replaces the government. Conversely, this research observes instances of religious groups overlapping in their outreach and actively seeking to attract followers within these communities. This competition for adherents can, at times, lead to increased intergroup tensions and strained relationships with neighboring communities holding different belief systems. This situation occurs in OSL communities with two religions in one village, such as Linau, Mentengah, Jelutung, Tembok, Pongok, Pasir Panjang, Pulau Lipan, Pulau Senang, Sungai Nona, and Air Ringat.

The factors contributing to marginalization stem from the unequal distribution of resources and opportunities. The OSL have traditionally depended on subsistence-based economies tied to islands, mangrove forests, and marine resources. However, the loss of land and the depletion of these resources have forced them to pursue alternative, often precarious livelihoods. Additionally, limited access to education and skill development programs has constrained their economic prospects, leaving them ill-equipped to engage in the formal economy. Consequently, the OSL are disproportionately represented in low-wage, informal sectors, perpetuating their economic vulnerability. Discriminatory practices and inadequate access to credit and financial services compound their challenges.

This situation can be observed on Kojong Island and Mensemut Island, where the OSL communities rely on Chinese middlemen or *towkay* throughout their lives. This is because the nearest economic resources (markets or buyers) are distant. To get to the nearest economic center, Penaah village, takes one to two hours by traditional rowing boat. The selling price of their catch is also not much different from the price the *towkay* gives. As a result, they prefer selling to the *towkay*, who come to their village once or twice a week (depending on the size of catch), even though the OSL know they are trapped in the patrons-client system. The *towkay* will then trade their catch to the Singapore market. Besides buying the OSL catch, the *towkay* also sell food, fuel, and other basic community needs, including clean water. Some of the OSL also have debts to the *towkay*. Eventually, the money earned from selling fish will be spent again to buy daily necessities from the *towkay*. Generations have passed down this practice since the OSL began settling. According to the *towkay* who visited their village, they are now in their second generation and will pass the business on to their grandsons.

Territorial Grabbing: Coastal Mining, Shrimp Farming, and the Mangrove Charcoal Industry

The OSL have historically been marginalized and excluded from mainstream development processes in the Lingga Regency. This marginalization is exacerbated by territorial grabbing, where their traditional territories and resources are being encroached upon by various actors, including large-scale industries, tourism projects, and infrastructure development. This has significantly impacted their livelihoods, through declining catch, losing access to traditional fishing grounds, and displacement from their ancestral lands. The main development issues in OSL in the Lingga Regency are sand mining, the mangrove charcoal industry, and industrial shrimp farming. Coastal pollution from industrial activities and land-based sources contaminates their waters and marine resources, posing risks to their health and the ecosystems they depend on. The loss of critical habitats, such as mangroves and coral reefs, due to coastal development, deforestation, and pollution, further exacerbates these challenges.

Figure 3

Development initiatives near Pulau Kojong

Note. Apple Map, Imaginary Satellite 2025. Source: Author.

Extractive industries like sand mining often impact coastal and marine ecosystems and can lead to pollution, habitat destruction, and depletion of fish stocks, directly affecting the OSL's traditional fishing grounds and livelihoods. This situation can be seen on Kojong Island, where a sand mining industry emerged around the OSL settlement,

disrupting their livelihoods. The OSL are affected by water pollution from mine tailings[9] and loss of access to resources around the island. The sand mining operation is situated approximately 1.5 nautical miles from Kojong Island, within Lengkok village in North Lingga District. According to the OSL communities on Kojong Island, tailings from the sand mining will move towards their island when the west wind blows. During this season, the OSL cannot go fishing around their village. Those with motorboats will go fishing more than four nautical miles away and undoubtedly with more expensive fuel costs. Meanwhile, those who use rowing boats lose their livelihoods. The seawater turns dirty and muddy, so they cannot dive or fish. This can be seen in Figure 3. The same issue also arises in other coastal communities, such as Merauke (Hallatu et al., 2021), Lampung (Sujadmiko & Meidiantama, 2022), and global case studies (Bisht & Martinez-Alier, 2022), or even in agricultural areas such as Malang (Purnomo et al., 2021).

Figure 4

Sand mine near Lengkok village

Note. Lengkok, July 2024. Source: Author.

The method of sand extraction in Lengkok involves dredging sand from the coast and then cleaning it into white sand. It has not yet been confirmed whether this sand mining industry applies sustainable practices. The OSL from Kojong Island suspect that the sand mining does not have complete permits, especially Environmental Impact Assessments and complete mining permits or export permits. The surrounding communities, including the OSL, did not receive further information about the existence of this mine. Their voice and consent were not assessed in the social impact analysis in the initial plan and construction of this sand mine. The OSL also stated that the sand taken by the mine

[9] Mine tailings are the materials left over after the process of separating the valuable fraction (minerals, metals, or other economic materials) from the uneconomic fraction of an ore.

was not only land sand but also sand from the beach landscape. The processed sand encompasses not only materials intended for construction purposes but also includes the processing of silica sand. In addition to the issue of tailings, the OSL from Kojong Island and Mensemut Island reported that a giant barge was moored around their fishing ground, damaging the coral area. During the sand transport period, the company moored arbitrarily in the waters near the village, which made it inaccessible for the community to fish in the area because of the many small ships carrying sand passing by to the giant barge. The OSL in Kojong said that until December 2024, four shipments of sand had been sent to China.

Figure 5

The pipe of an industrial shrimp farm in Lengkok during low tide

Note. Lengkok, July 2024. Source: Author.

In addition to the mining issue, the OSL on Kojong Island also face the growth of vaname or whiteleg shrimp (Litopenaeus vannamei) ponds. The needs of the local market in the Riau Islands and Singapore have ensured the continued growth of this business. Initially, the shrimp farming industry was situated on Dabo Island. However, since early 2024, this activity has also been implemented in the Lingga Islands, one of which is Lengkok village in North Lingga. No OSL practice shrimp cultivation which is mainly carried out by large capitalists. One of the new locations for shrimp farming is Lengkok, right next to the sand mine (see Figure 3). The environmental problems caused by this activity are the same as tailings from sand mines dumped directly into the open sea. The unconsumed shrimp food, water residues, and other waste pollute the sea and form toxic sediments. However, when field data for this study was collected, cultivation was still in its early stages, and some ponds were still under construction. Cases of environmental

conflicts due to shrimp farming have also occurred in several places in Indonesia, such as the Mahakam River (Bosma et al., 2012), Trenggelek (Pujayani et al., 2023), and other regions (Boa et al., 2023).

Another issue documented in this research is the disparity between traditional ecological knowledge and the market economy. According to OSL belief, mangroves serve a multitude of purposes that contribute to their cultural, economic, and ecological well-being. These include fruits, leaves, honey, and timber for building boats and houses. The intricate root systems offer shelter and breeding grounds for numerous species, ensuring an abundant food source and income. For the OSL, mangrove ecosystems provide a critical habitat for fish, crustaceans, and other marine life, serving as important fishing grounds for them and providing a variety of non-timber forest products that the OSL utilize for food, medicine, and construction materials. In a broader context, mangrove conservation is one form of the traditional ecological knowledge of the OSL that can combat the climate crisis (Ariando, 2018). In terms of cultural significance, the OSL hold spiritual beliefs and practices associated with mangroves, recognizing them as sacred spaces inhabited by spirits and ancestors. Unsustainable harvesting of mangrove wood can lead to deforestation, impacting OSL communities' access to vital resources and disrupting their traditional way of life.

Figure 6

Orang Suku Laut cut and bring mangrove wood to a dapur arang

Note. Penaah, November 2018. Source: Author.

Among the factors that accelerated their departure from nomadic livelihood were *dapur arang*[10]. The OSL report that *dapur arang* sites existed prior to the establishment of their villages. Their initial settlement near *dapur arang* in this area was facilitated by a *towkay* , who probably controlled and managed the OSL who formed the primary labor force. Over time, through the process of sedentarization and population increase, the OSL established a village at this location. Notably, the prevalence of *dapur arang* as a prefix in the names of several OSL villages currently, such as Dapur Arang Kelumu, Dapur Arang Secawar, Dapur Arang Pongok, Dapur Arang Batu Belubang, and Dapur Arang Jelutung, further suggests a historical and spatial connection to this earlier presence and the subsequent pattern of settlement.

The *dapur arang* industry involved men of productive age and all their family members. The division of labor designated adult men primarily to gather mangrove logs. This task requires physical strength and expertise in navigating the mangrove ecosystems. Women and children engaged in post-harvest activities, mostly packing charcoal and other less labor-intensive roles. This delineation of tasks highlights the gendered nature of labor and reflects the strategic allocation of human resources that aligns with physical capabilities. The primary raw material for making charcoal is the tall-stilt mangrove (*Rhizophora apiculata*). The other types of mangrove wood are used as fuel to heat the charcoal ovens.

[10] Dapur arang are ovens for burning wood to become charcoal, shaped like a semicircular mound. This industry entered the Lingga archipelago in 1953 and came to an end with the land use moratorium in 2007. In Lingga Regency, charcoal burning was revived after receiving a special operating permit from local government in 2009 and was under the management of a registered cooperative (Suhardiman et al, 2025). The operations of dapur arang were formally ended in 2023 by the central government, and as of June 2024, the cooperative's permit had not been renewed.

Figure 7

Mangrove charcoal industry in Jelutung

Note: July 2024. Source: Author.

The *towkay* for *dapur arang* are also the *towkay* for fish trading and selling daily goods. They bind OSL livelihoods into a patron-client system by providing basic needs such as clothing, food, and shelter. As clients, the OSL must work under and be always dependent on the orders and leadership of the *towkay*. Each of these *towkay* has a specific mangrove forest area, such as in Jelutung, Pongok, and Kelumu. However, the OSL feel that their subsistence economic life is better fulfilled by the nomadic or *Bakelam* way of life. Until 2023, there were still 10 active *dapur arang* sites in the Lingga Regency , almost all of which still employ OSL. According to information from local activists in 2023, the charcoal is exported to China, South Korea, Japan, and even the European market. This industry has grown since the early 2000s. The recorded deforestation rate is around 486 hectares per year and the total damaged area is 7,000 hectares, with an estimated economic and ecological service value of around USD 90,000 per hectare. The *dapur arang* operate with permits and are recognized as legal entities in the form of cooperatives. The Lingga Lestari Mangrove Cooperative serves as the legal entity that oversees all *dapur arang* operations. However, its permit was revoked at the end of 2023. This decision was influenced by "unseen" power dynamics present at various levels of management. As of June 2024, its activities were still at a halt. Several ancient charcoal kitchens from before Indonesia's independence offer tourism potential as cultural heritage sites. This has been developed in Panglong Berakit, a village on Bintan Island, which is also an OSL village.

Within the context of traditional OSL knowledge, *dapur arang* represent a dichotomy of livelihoods. Many young OSL choose to work as laborers in *dapur arang* to meet

their basic needs. However, this often leads to a loss of traditional ecological knowledge. The young think working as mangrove laborers is nothing 'sinful' or against their roots. They do not know the hereditary traditional knowledge used to protect the mangrove forest. This research explored the perspectives of OSL youth regarding the importance of mangroves, but none of them seem to recognize their significance. OSL youth recognize mangroves as a crucial natural barrier that supports their marine-based livelihoods (economic function). This dynamic highlights how shifts in traditional ecological knowledge can pose threats to their rights and access to traditional territories. Furthermore, it is important to encourage alternative economic activities that lessen the strain on mangrove ecosystems while simultaneously supporting the economic prosperity of the OSL communities in the Lingga Regency.

Institutional Complexity and Power Dynamics

The OSL struggles are further compounded by their complex institutional landscape. The interplay of various government agencies, private corporations, and dominant communities creates a power dynamic that often disadvantages the OSL in the Lingga Regency. Their voices and concerns are frequently overlooked or ignored in decision-making processes, leading to policies and projects that do not adequately address their needs and aspirations. The Lingga Regency is tied to a rich historical record and legacy, as the former Riau-Lingga Sultanate, which existed from 1824 to 1911 before being dissolved following Dutch colonization. Some of the remains of this Sultanate are still found in the Lingga Regency today, such as the castle, cultural heritage sites, and other archeological sites.

None of the written stories mention the relationship between the Sultanate and OSL rulers. For the Sultanate, the OSL served as a navy tasked with maintaining the security of the sea and coasts. The OSL served several Sultans, assisting them in preparing for traditional events as wood gatherers or fish providers. Some OSL figures were also entrusted with holding particular titles and responsibilities managing specific areas. Another story of this relationship is given by OSL elders. They believe they have a clan (from intermarriage and acculturation) who played important roles in the Sultanate. Some even mentioned an ancestor who was a famous and supreme leader. According to the OSL elders in Sungai Buluh, long before the establishment of the Sultanate, the OSL inhabited the Riau-Johor-Malacca archipelago and had their own customary leadership structures. They reached an agreement with the Sultan regarding the management of their respective territories, allowing the OSL to maintain their connection to their ancestral domains and the marine environment. However, those historical narratives remain contested, which adds complexity and tension to the current situation.

This unresolved historical narrative continues to contribute to derogatory labeling and hate speech directed at the OSL by the dominant non-OSL community. The scanty and unclear historical accounts perpetuate apprehension between the OSL and the dominant non-OSL community in the Riau Islands, particularly when discussing the indigenous status of the Lingga region. The current situation indicates that the OSL

are less powerful, primarily due to their smaller numbers, lower levels of education, and reduced participation and involvement in various sectors. In terms of advocacy, there is no organization working with the OSL. The Kajang Foundation fights for fundamental OSL rights, but it does not target the OSL's basic needs. The challenges facing the OSL are primarily due to their geographical distance from community centers and markets, limited access to the internet and smartphones, and low literacy rates. Another significant issue is the low self-esteem among OSL individuals when it comes to communicating with non-OSL islanders. Until 2024, the number of OSL children from the Lingga Regency who have achieved university education is still less than 10 (unpublished data from the Kajang Foundation).

Due to their limited human resources, movement, and indigeneity, the OSL are often used as political tools, especially during the regional political election season. It proves that the agency of OSL that has emerged today differs from their past lives, where the sea was their main living space. Their sedentarization has oriented the current generation's lifestyle towards the land. Their paradigm of ethnofisheries is shifting, and they are starting to demand assistance for housing and fishing gear. Several local politicians and individuals sometimes incite them to protest against policymakers.

The events of July 2022 in Bintan (capital city of Riau Islands Province), where the OSL were mobilized for a housing protest, offer a revealing illustration of emerging forms of agency within the community. The testimonies from participating OSL members indicate a strategic manipulation of their identity and aspirations. The initial framing of the invitation, seemingly orchestrated by the newly appointed Governor who presented himself as an OSL ally recognizing their customary presence, served as a powerful catalyst for their involvement. This suggests a nascent awareness and strategic utilization of their indigenous identity as a means to engage with the formal political sphere and articulate their demands. However, the subsequent redirection of their protest towards housing by a provocateur highlights the vulnerability of this emerging agency to external influences and potentially conflicting agendas.

The evidence presented points towards the development of a new agency among the OSL that operates across diverse objectives and interpretations. This evolving agency marks a significant departure from the historically observed lifestyle and disposition of the OSL, which has traditionally been characterized by an avoidance of direct confrontation and disputes. This shift suggests an increasing willingness and capacity within the community to engage in collective action and public advocacy to address their needs and assert their rights within the broader socio-political landscape. This transformation in agency warrants further investigation to understand its drivers, internal dynamics, and long-term implications for the OSL community's relationship with the state and neighboring populations.

Figure 8

Representatives of OSL communities protesting at the Provincial Government Office, Dompak

Note. 18 July 2022. Source: Ardiansyah Putra/ulasan.co.

This research argues that the situation is changing due to generational gaps and adaptive oversight of land-based OSL, especially the younger generation who lack the skills to go fishing. On the other hand, this new agency of the OSL reflects a growing awareness of their rights, a desire for self-determination, and a commitment to shaping their development pathways. However, this agency is not without its challenges. The OSL still face significant obstacles to a bundle of rights, including discrimination, limited access to resources, and the ongoing threat of land and coast grabbing. It shows that the new agency challenges traditional stereotypes and emphasizes the potential of OSL to act as active agents of change through their autonomy.

Governing Imaginaries of Orang Suku Laut in the Lingga Regency

The Anthropocene is often seen as a time of 'new' environmental changes, such as climate-induced resettlement, requiring significant societal adaptation. However, many of these 'new' phenomena are actually longstanding issues (Whyte et al., 2019). For the OSL, this relation is related to hereditary traditions of environmental 'mobility' and nomadic territory. It includes the diverse coping mechanisms that OSL communities employ to adapt to the socio-economic and environmental changes associated with sedentarization and the erosion of their maritime identity. The OSL, as guardians of the sea, have the planetary knowledge to govern their fishing grounds and territory. The OSL listen and respond effectively to signals from the earth system and have the foresight to anticipate potentially catastrophic changes.

The existence and traditional ecological knowledge of the OSL have not been valued as vital resources for sustainable natural resource management. They are still seen as disrupting the smooth development path managed by the ruling regime and are contrary to mainstream conservation efforts. Consequently, development that overlooks traditional knowledge is harmful to the lives of the OSL and poses a threat to their basic rights. Such development is a significant problem that accelerates the loss of cultural identity and knowledge for the OSL. The multifaceted challenges faced by OSL communities in the Lingga Regency reveal a complex interplay of historical marginalization, shifting power dynamics, and rapid environmental changes. While the OSL possess valuable traditional ecological knowledge and a deep connection to the marine environment, they face significant constraints in accessing and utilizing marine resources. These constraints include historical dispossession, limited legal recognition of their rights, and the impacts of climate change and unsustainable development practices.

The governing imaginaries[11] as defined by Chandler and Reid (2019) can reflect the hope and complexity of the OSL in the Lingga Regency in the Anthropocene. The governing imaginaries of the OSL, encompassing their shared beliefs, values, knowledge systems, and cultural understandings, profoundly shape their perception of, interaction with, and management of their environment, social structures, and external relationships. These imaginaries, far from being static, are dynamic and continuously evolving, influenced by historical trajectories, inter-community and state interactions, and the multifaceted environmental and socio-economic transformations they encounter, notably sedentarization and escalating resource competition. Comprehending these governing imaginaries is therefore paramount to understanding the OSL's perspectives on resource stewardship, their responses to development interventions, their conceptualization of rights and territoriality, and their emergent agency within broader societal contexts. This framework allows for a nuanced analysis of their distinctive epistemologies and ontologies within the epoch of the Anthropocene.

The contemporary governing imaginaries surrounding the evolving identity of the OSL also reveal a complex negotiation between modernization imperatives, national development agendas, and the perceived necessity of integrating this historically maritime community into mainstream Indonesian society. These imaginaries are actively constructed and contested by a diverse array of stakeholders, including government institutions, non-governmental organizations, and the OSL themselves, often resulting in divergent perspectives on issues of identity, progress, and the imperative of cultural preservation. One dominant narrative promotes the sedentarization and cultural assimilation of the OSL, advocating for a transition from their ancestral nomadic maritime existence to fixed, land-based settlements. This perspective is frequently rationalized as a prerequisite for improved access to essential services such as education, healthcare, and economic opportunities, aligning with overarching national development objectives. However, this

[11] The collectively held ideas, beliefs, values, and mental models that shape how societies understand, envision, and ultimately govern themselves and their relationship with the world, particularly in areas like environmental management and social development (Chandler & Reid, 2019).

vision often overlooks the profound cultural significance of the OSL's maritime heritage and its deeply rooted spiritual and practical connections to the marine environment. Conversely, another influential governing imaginary emphasizes the latent economic potential of the OSL, particularly within the burgeoning sectors of tourism and fisheries. This perspective seeks to leverage the OSL's unique cultural capital and specialized marine knowledge, potentially fostering economic empowerment and enhancing their livelihoods. Nevertheless, this approach also raises critical concerns regarding the potential commodification of their cultural heritage, the risk of exploitation by external actors, and the urgent need to ensure the equitable distribution of any derived benefits within the OSL communities.

Furthermore, there are emerging imaginaries that focus on cultural revitalization and self-determination. These perspectives recognize the importance of preserving OSL traditions, languages, and knowledge systems while supporting their autonomy in shaping their development pathways. This approach encourages the OSL to be active agents in their transformation rather than passive recipients of external development interventions. It includes how the OSL should position their cultural agency in movement, participation, and institution. The interplay of these governing imaginaries creates a dynamic and contested landscape, with ongoing negotiations and struggles over the future of the OSL in the Lingga Regency. Understanding these imaginaries is crucial for critically examining the implications of development policies and interventions, ensuring that they respect OSL rights, promote their well-being, and support their cultural continuity in the face of ongoing change.

A crucial aspect of this research involves understanding how the OSL broaden and enrich discussions about the Anthropocene by incorporating post-humanist ideas. This perspective allows for recognizing diverse knowledge systems that move away from the idea that humans are the only important actors in understanding the world (Dovchin et al., 2023). The ways the OSL understands and relates to the world align with post-humanist approaches, emphasizing give-and-take relationships with the land and viewing non-human beings as living entities with their own agency. The voices of the OSL encourage a return to ancestral ways of knowing, fluid territory, and a reconnection with our interconnected relationships to ensure the well-being of both nature and culture. This research highlights the necessity of a more detailed understanding of how the OSL make a living and the creation of fairer and more sustainable ways to manage resources.

To ensure the well-being and sustainable development of the OSL communities, a multi-pronged approach is crucial. Firstly, legal and policy frameworks must be strengthened to recognize and uphold OSL customary rights, ensuring participation in decision-making processes and integrating traditional knowledge into resource management. Secondly, sustainable livelihood options should be diversified through initiatives like community-based eco-tourism and sustainable fisheries management. Thirdly, addressing environmental challenges such as climate change impacts and habitat degradation is essential. Finally, promoting cultural revitalization through intergenerational knowledge transmission and fostering cultural exchange will contribute to OSL identity and self-determination.

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CHAPTER 2

Safeguarding Rights and Sustainability: Human Rights Implications of Big Data Technologies in Environmental Monitoring

Ratnaria Wahid
College of Law, Government and International Studies, University Utara Malaysia

Abstract

Big data technologies are revolutionizing environmental monitoring, offering new opportunities to protect both ecosystems and fundamental human rights. In Southeast Asia, where rapid development often comes at an environmental cost, these technologies can play a transformative role in ensuring sustainability and accountability. This chapter has two primary objectives. First, it analyzes how big data analytics enhances environmental monitoring capabilities, leading to the strengthening of resource management, monitoring environmental quality, enhancing transparency, and reducing disaster risks, all of which contribute to the realization of the right to a clean and safe environment, the right to health, the right to life and security and the right to information. Second, the chapter critically assesses the human rights concerns associated with big data in environmental monitoring. While these technologies provide invaluable insights, their implementation raises significant risks, including privacy violations, algorithmic bias and data-driven discrimination, suppression of dissent and democratic participation, and misuse and inaccuracy of data as well as labor abuse. Without adequate safeguards, big data may reinforce existing inequalities and restrict fundamental freedoms rather than promote justice and sustainability. This chapter advocates for policies and frameworks that balance technological advancements with ethical considerations, ensuring that data-driven environmental protection efforts do not come at the expense of human rights. By highlighting both the opportunities and risks, this chapter provides a roadmap for leveraging big data responsibly to foster a more sustainable, transparent, and equitable future.

Introduction

The convergence of big data analytics, environmental monitoring, and human rights is a complex and rapidly developing area, characterized by both significant opportunities and inherent challenges (Sarfaty, 2017; Latonero, 2018; Martin and Singh, 2022). Big data analytics has emerged as a transformative tool for environmental monitoring, offering unprecedented capabilities to enhance resource management, track pollution, and address climate change. These technologies allow for real-time tracking of pollution, precise identification of contamination sources, and accurate prediction of environmental risks, thus fostering a proactive approach to environmental protection (Vitaly and Kuizheva, 2022; Kshetri et al., 2020). Big data technologies have a dual nature namely their ability to enhance environmental stewardship while simultaneously posing a threat to human rights if not implemented responsibly. This creates a tension between the need for efficient environmental monitoring and the imperative to safeguard individual rights and freedoms.

The implementation of big data in environmental monitoring is accompanied by significant human rights concerns that must be addressed. A key challenge is the potential for privacy violations, which arises from the extensive collection and analysis of personal information (Vayena and Tasioulas, 2016). The risk of unauthorized tracking, profiling, and misuse of sensitive data undermines public trust and discourages civic engagement. Additionally, data bias and discrimination present major concerns; unrepresentative datasets can result in skewed environmental policies that fail to address the needs of marginalized communities, exacerbating existing environmental injustices (Vayena and Tasioulas, 2016). Furthermore, the potential for big data systems to be used for surveillance and control of individuals critical of governmental or corporate practices poses a threat to freedom of expression and democratic participation. Finally, the digital divide can hinder the effective use of big data in some regions, creating disparities in access to technology and environmental protection.

Despite the growing body of literature on big data analytics, environmental monitoring, and human rights, significant gaps remain. The majority of existing studies are also limited to developed countries, with minimal focus on the context of developing nations, which have unique challenges and require context-specific research (Murad et al., 2023; Sharma et al., 2022). Existing studies often focus on the technological aspects of big data, overlooking the ethical and social dimensions of its application. There is a need for research that bridges this gap by providing a holistic analysis of the human rights implications of big data technologies in environmental monitoring in the Southeast Asian region. Hence, this chapter has two primary objectives:

- First, to analyze how big data analytics enhances environmental monitoring capabilities, leading to protection of human rights.
- Second, to critically assess the human rights concerns associated with the implementation of big data analytics in environmental monitoring.

By examining both the beneficial applications and the potential harm of big data in environmental monitoring, this chapter contributes to a more informed and balanced

perspective on the intersection of technology, environment, and human rights. The analysis is vital for developing effective policy frameworks and guidelines for the responsible use of big data in environmental monitoring, particularly in Southeast Asia. The research seeks to ensure that the deployment of these technologies protects fundamental human rights, fosters equitable development, and enhances environmental sustainability. The chapter provides insights for policymakers, environmental organizations, and technology developers, that promote best practices.

Concept and Evolution of Big Data

The rise of big data as a tool for environmental monitoring is a direct response to the scale and complexity of environmental challenges facing the region. Big data, defined by its volume, variety, and velocity, refers to datasets that surpass the capacity of conventional software tools (United Nation Development Programme, 2023). The digital revolution has brought forth an array of technologies that enable the collection and analysis of these massive datasets, from satellite imagery capable of mapping deforestation in real-time (Kshetri et al., 2020), to Internet of Things (IoT) sensors that monitor air and water quality at a granular level (Bormida, 2021), to social media platforms that reveal public sentiment and emerging environmental crises. These technologies are not merely tools for observation; they are powerful instruments capable of transforming how we understand and interact with the environment. The rapid evolution of these technologies, driven by advancements in computing power, data storage, and analytical capabilities, has opened new pathways for tackling environmental issues (Kshetri et al., 2020; Téllez Carvajal, 2020; Banchhor & Srinivasu, 2022), including the following.

- Tracking climate change: using sensor networks and satellite data to monitor climate patterns, deforestation rates, and changes in biodiversity.
- Monitoring water and air quality: deploying IoT sensors and satellite imaging to detect pollution levels, enabling quicker responses to environmental hazards.
- Detecting deforestation and illegal logging: utilizing remote sensing and image analysis to identify areas of forest loss and illegal logging activities.
- Disaster management: developing early warning systems using real-time data, coupled with sophisticated analytical capabilities for better prediction and response.
- Resource management: using data-driven analytics for efficient allocation and conservation of resources such as water and energy.

At the heart of big data technologies are the four essential components: data mining, data storage, data analytics, and data visualization (Duval et al., 2023). Data mining involves the extraction of useful patterns and trends from raw data, often using techniques such as Knowledge Discovery in Databases (Duval et al., 2023). The rise of the IoT has been instrumental in this process, providing a vast network of embedded sensors and devices that collect diverse data points. This includes wearable technology, smart home devices, and smartphones, all of which contribute to a constant stream of data (Duval et al., 2023). These devices communicate with each other, storing information in the cloud

where it can be accessed by data analytic tools. The growth of digital data and new sources has also led to the expansion of data collection (Bormida, 2021). Data storage, the second component, involves the processes and technologies necessary to preserve the massive data sets that are generated. Big data demands infrastructure that can handle the volume and variety of the data, including cloud storage solutions, distributed file systems, and other advanced storage mechanisms (Thayyib et al., 2023). Third, data analytics refers to the tools and techniques used to analyze and derive meaningful information from these massive data sets. This process may involve statistical analysis, machine learning, and artificial intelligence (AI) to reveal hidden patterns, trends, and correlations (Bormida, 2021). Finally, data visualization is crucial to present results in an easy-to-understand format, allowing decision-makers and stakeholders to grasp the implications of complex data analyses effectively (Duval et al., 2023). This can take the form of graphs, charts, maps, and other visual aids, which translate complex data into accessible information. The combination of these four elements constitutes the powerful framework for big data environmental monitoring.

The evolution of big data has transformed environmental monitoring from a primarily observational discipline to a predictive and proactive science. Traditionally, environmental monitoring relied heavily on manual data collection and analysis, which was often slow, costly, and geographically limited (Chen et al., 2021). This approach was ill-equipped to handle the vast scale of contemporary environmental issues. However, with the advent of big data, the ability to collect and process vast amounts of data has transformed the field. Now, environmental monitoring stations can be networked, sharing data on resource availability, pollution levels, ecological conditions, and species distribution (Piskorskaya and Malanina, 2020). This holistic approach allows for the creation of comprehensive environmental assessments that span entire regions or even continents. Furthermore, remote sensing technologies, such as satellite imagery, have enabled real-time monitoring of large geographical areas (Huanying, 2021). This makes it possible to track deforestation, monitor air and water quality, and observe changes in land use over time. These remote sensing technologies are characterized by high accuracy and wide monitoring ranges (Huanying, 2021). Data collection has also become more comprehensive and timely. The deployment of IoT sensors has added yet another layer to environmental monitoring (Duval et al., 2023). These sensors, placed in a multitude of locations, provide continuous, real-time data on various environmental parameters like temperature, humidity, pollution levels, and soil conditions. This constant stream of information allows for rapid responses to emerging environmental threats and also enables the development of predictive models for better long-term planning.

The evolution of big data technologies in environmental monitoring is ongoing and is driven by the relentless pursuit of greater efficiency, accuracy, and accessibility. A key focus of the current trends is the integration of AI and machine learning to enhance predictive modeling capabilities and automate data analysis tasks (Tosi et al., 2024). Machine learning algorithms can analyze complex environmental datasets to identify patterns, predict future environmental scenarios, and support decision-making processes (Huanying, 2021). The use of AI can increase the efficiency of environmental monitoring

by enhancing the processing and analysis of data in real-time. In the future, there will also be an increased emphasis on edge computing, which involves processing data closer to the source, rather than relying solely on cloud-based systems (Tosi et al., 2024). This reduces latency, saves bandwidth, and enables real-time decision-making in remote or resource-constrained areas (Tosi et al., 2024). The move towards more decentralized data processing will further enhance the efficiency of big data applications in environmental monitoring. Another significant trend is the growing importance of data integration, which involves combining multiple data sources to create a more complete and nuanced picture of environmental conditions (Huanying, 2021). This integration helps to create a holistic overview of the ecosystem, making analysis more accurate. Furthermore, the increased use of blockchain technology is aimed at enhancing data security, transparency, and accountability in environmental monitoring (Tosi et al., 2024). This will enable secure data sharing and verification. These innovations reflect the ongoing effort to harness the power of big data to create a more sustainable future, while also protecting human rights. The expansion of the application of these technologies depends on the resolution of current challenges and the development of safeguards.

Big data technologies have thus revolutionized environmental monitoring, moving from basic observational practices to sophisticated, data-driven approaches. The combination of data mining, data storage, data analytics, and data visualization has created a powerful framework for understanding and interacting with the environment. From tracking climate change and monitoring air and water quality to detecting deforestation and managing resources, the applications of big data are diverse and transformative. The field continues to evolve with the integration of AI, edge computing, and blockchain, offering immense potential for creating a more sustainable and equitable world. It is essential to be conscious of potential pitfalls and the need for safeguards to ensure that the deployment of these technologies adheres to ethical principles and human rights standards.

Role of big data technologies in environmental monitoring

Building upon the transformative potential of big data technologies in environmental monitoring, it is essential to explore how these technologies can be leveraged to protect human rights. There are multifaceted ways in which big data can contribute to safeguarding fundamental rights, particularly in the context of environmental governance namely by strengthening resource management, monitoring environmental quality, enhancing transparency, and reducing disaster risks, all of which are vital for protecting human well-being and ensuring sustainable development.

a) Strengthening Resource Management

Big data technologies are transforming resource management by enabling organizations to collect, analyze, and act on vast amounts of real-time data, thus enhancing operational efficiency and decision-making. This transformation aligns with the core principles of Industry 4.0, namely interoperability (seemless communication between systems), virtualization (digital representation of physical assets), decentralization

(autonomous decision-making by smart systems), real-time capability (immediate data analysis and response), service orientation (integration of services through digital platforms), and modularity (flexible system adaptation), (Khan et al., 2017). By integrating the IoT sensors, AI, and blockchain systems, industries and governments can refine resource allocation and minimize waste. These advancements have profound implications for human rights, particularly in safeguarding the right to health, the right to a clean and sustainable environment, and the right to an adequate standard of living, as recognized under international human rights law. Big data enables industries and governments to promote circular economy practices by optimizing resource allocation and reducing waste. For example, in the manufacturing sector, big data analytics can identify areas where materials are underutilized or where energy consumption can be minimized. For example, in the Malaysian oil palm industry, remote sensing and GIS (Geographic Information System) help in disease detection and yield estimation, while some Malaysian paddy farmers use automated machinery for precise water and fertilizer application (Hassan, 2024). These technologies reduce input costs, increase productivity, and promote sustainable farming practices, contributing to the country's food security goals. Similarly, farmers in the fertile plains of Rangsit, Thailand, who once struggled with unpredictable weather and pest invasions are now able to make informed decisions, optimize resource use and ensure a bountiful harvest with real time data at their fingertips (Sheikh et al., 2024). These efficiencies directly contribute to the protection of human rights, as they guarantee equitable access to essential resources and promote sustainable development. This means that communities that have historically struggled with environmental degradation and resource scarcity can benefit from data-driven approaches that enhance both environmental protection and the fulfillment of basic needs.

b) Monitoring Environmental Quality

Furthermore, big data plays a critical role in monitoring air and water quality (Ma et al., 2021), which is essential for protecting the right to health and the right to a clean and safe environment. By integrating data from satellite imagery, IoT sensors, and citizen reports, big data enables real-time tracking of pollution levels, identification of contamination sources, and prediction of future environmental risks (Popescu et al., 2024; Shaharum et al., 2020). This enhanced transparency strengthens government accountability and supports policy responses to mitigate harm, particularly for vulnerable populations. For instance, in Jakarta, real-time air pollution data provided by Indonesia's Agency for Meteorology, Climatology and Geophysics Air Quality Index system, allows policymakers to implement traffic restrictions and industrial regulations (Rahutomo et al., 2021). Similarly, Jakarta's Smart City initiative integrates water quality sensors to track contamination levels (Syalianda et al., 2021). Such real-time monitoring systems are crucial for identifying when pollution exceeds legal standards and for initiating prompt action to mitigate its negative impact on health and the environment (Salsabila et al., 2021). These systems can also be used to study environmental trends over time, allowing for long-term planning and the effective enforcement of legal frameworks (Salsabila et al., 2021). The

use of big data for monitoring air and water quality directly contributes to the right to health, ensuring that individuals are not exposed to hazardous levels of pollution, and can therefore lead healthier lives.

c) Enhancing Environmental Transparency

In addition to resource management and environmental quality monitoring, big data technologies enhance environmental transparency, which is vital for empowering individuals, communities, and stakeholders with the information they need to participate in environmental governance and make informed decisions. The aggregation of vast datasets from satellite imagery, remote sensors, and citizen reporting enables more accurate tracking of deforestation, pollution levels, and other ecological threats (Dritsas and Trigka, 2025). For instance, researchers have effectively used satellite data to track deforestation in the Amazon rainforest and analyze the extent of Indonesian fires (Kshetri et al., 2020). Furthermore, big data technologies can contribute to forest fire prevention and management by monitoring fire occurrences, predicting potential fire risks, and enabling early warning systems (Chew, 2022). This transparency holds both state and private actors accountable, ensuring compliance with environmental regulations and facilitating policy interventions to mitigate harm. For example, the air quality monitoring systems in Bangkok utilize big data analytics to offer real-time pollution indices, enabling informed policymaking and public health interventions (Onchang et al., 2022). This increased environmental transparency contributes to the protection of fundamental human rights such as the right to health and the right to a clean and safe environment. The right to information is also supported through real time environmental monitoring, as it provides stakeholders with the data necessary to make informed choices and advocate for necessary policy changes (Wong et al., 2021).

These applications of big data in environmental governance are reinforced by relevant international legal provisions.

- The Universal Declaration of Human Rights (UDHR) also supports these rights. Article 25 affirms the right to health and well-being, which is threatened by environmental harm. The UDHR serves as a foundational document that recognizes the importance of environmental factors to overall wellbeing, providing a legal backdrop that helps to drive states to take action.
- Article 12 of the International Covenant on Economic, Social and Cultural Rights obligates states to take steps to improve environmental hygiene as part of the right to health. This provision ensures that states are responsible for taking actions that actively improve environmental conditions that can negatively affect human health, and it also allows for the use of technology and data analysis to fulfill that duty.
- Article 24 of the Convention on the Rights of the Child (CRC) also recognizes children's right to a clean environment, emphasizing the need for pollution control. The CRC acknowledges that children are especially susceptible to the adverse effects of environmental degradation and therefore require specific measures for protection.

- Furthermore, the United Nations General Assembly Resolution A/76/L.75 (2022) explicitly affirms the right to a clean, healthy, and sustainable environment, reinforcing states' obligations to utilize technological solutions for environmental protection. This resolution solidifies a global consensus that all people are entitled to a healthy and sustainable environment, and that states must incorporate such standards into their policies.

These international instruments establish a legal framework that supports the use of big data technologies to monitor and protect environmental quality. At the national level, many countries have incorporated environmental protections into their legal systems. For example, Indonesia's Law No. 32/2009 on Environmental Protection and Management mandates environmental monitoring (Widodo, 2016). Malaysia's Environmental Quality Act 1974 and Thailand's Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992) provide regulatory measures to address pollution (Mustafa, 2011; Lekfuangfu et al., 2023). The effective use of big data to monitor and enforce these laws strengthens the practical application of these legal provisions and increases their impact.

To understand the power of big data in protecting human rights, consider the case of the Indigenous Aruese people in Maluku, Indonesia (Reytar et al., 2023). For generations, over 60,000 Aruese lived in harmony with their lush forests — hunting, gathering medicinal plants, and protecting sacred sites passed down through generations. The forest was more than just land; it was their identity. But everything changed when a powerful corporation arrived, clearing vast swaths for timber and agriculture. Rivers turned murky, medicinal plants vanished, and the heart of their culture was torn apart. With no political influence or financial power, the Aruese seemed powerless — until they turned to technology. Partnering with Forest Watch Indonesia (FWI), they began using satellite data from Global Forest Watch to expose the destruction. Armed with the Forest Watcher mobile app, local Forest Monitors navigated deep into the forest, documenting illegal logging with photos, audio recordings, and written reports. They tracked timber shipments to ports, capturing evidence of smuggling and sending it to FWI, which compiled the data into irrefutable proof. The breakthrough came in February 2019, when the Indonesian Ministry of Environment and Forestry acted on their findings, seizing 38 containers of illegally harvested timber. The Aruese had done what once seemed impossible: they held powerful interests accountable and secured greater transparency for their land. This case study illustrates the potential for big data to amplify marginalized voices and secure fundamental rights. It shows how technology can provide a voice to people who are often silenced and ignored, and how data can serve as a powerful tool for justice.

d) Reducing Disaster Risks

Big data technologies also play a crucial role in disaster management, which is directly linked to the rights to life, security, and health. By enhancing predictive capabilities and emergency response, big data ensures that vulnerable populations receive timely assistance and protection during disasters.

- In the Philippines, the Nationwide Operational Assessment of Hazards (Project NOAH) utilizes satellite imagery, weather data, and AI-driven flood modeling to predict typhoons and flooding (Lagmay et al., 2017; Stephenson et al., 2018).
- In Indonesia, the Indonesia Tsunami Early Warning System leverages big data from seismic sensors and ocean buoys to issue real-time tsunami alerts (Utomo et al., 2025).
- Similarly, the Thailand government and Pacific Disaster Center (2021) operationalized an early warning and hazard monitoring technologies called ThaiAWARE which allow Thailand residents and visitors to receive disaster notification for tsunamis, floods, wildfires, or COVID outbreaks.

At the international level, UDHR Article 3 affirms the right to life and security, which is directly threatened by inadequate disaster response. The Sendai Framework for Disaster Risk Reduction 2015-2030 also emphasizes the role of technology in reducing disaster risks and protecting human lives (Pearson and Pelling, 2015). Furthermore, Article 12 of the ICESCR mandates states to take measures to prevent environmental and health hazards, reinforcing the need for data-driven disaster preparedness. These efforts ensure that governments can effectively mitigate risks, protect vulnerable communities, and reduce the human cost of natural disasters.

Hence, big data technology significantly contributes to the protection of human rights by enhancing resource management, monitoring environmental quality, increasing transparency, and aiding disaster management. By integrating various data sources and analytical tools, these technologies offer unprecedented insights into environmental challenges and support evidence-based policymaking. The backing of international and national legal frameworks for these approaches further emphasizes their legitimacy and importance. The power of big data is not merely theoretical; it can be a powerful tool for empowering marginalized communities, holding corporations accountable, and protecting human rights.

Human Rights Concerns on Big Data Technologies

Despite its potential, big data technologies are also associated with human rights concerns and challenges , particularly in the context of environmental monitoring. These concerns, when left unaddressed, can undermine the very principles of human rights and exacerbate existing inequalities.

a) Privacy Violations

Privacy violations are a significant threat posed by big data. The collection and analysis of large datasets can inadvertently expose personal information, undermining the right to privacy. The risk of surveillance and misuse of sensitive data raises concerns about individual freedom and autonomy. Article 12 of the UDHR states that "No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the

law against such interference or attacks." Similarly, Article 17 of the ICCPR protects the right to privacy and to legal protection against interference. This right is further emphasized in the UN General Assembly Resolution on the Right to Privacy in the Digital Age which underscores the importance of considering the principle of non-discrimination (Article 26 of the ICCPR) when ensuring the right to privacy. The UN Human Rights Council also notes that digital platforms can be vulnerable to surveillance, interception and data collection, which could have a real impact on people's rights. Even when data is collected for legitimate purposes such as public health monitoring, its use must be proportional to the objective and should not produce undue harm and risks. A good illustration of this is when Nature Society (Singapore) experienced a significant data breach affecting 5,131 individuals who had created user accounts on the society's website. The compromised data, potentially exposed on hacking forums, raised serious concerns about the security of personal information collected for environmental initiatives. Investigations revealed that the society lacked designated personnel for data protection compliance and had not implemented adequate security measures. Consequently, the Personal Data Protection Commission (2022) of Singapore fined the organization SGD14,000 for non-compliance with data protection obligations. This incident underscores the risks associated with inadequate data security in environmental organizations, where the misuse of sensitive data can lead to unintended surveillance and erosion of individual autonomy.

b) Bias and Discrimination

The issue of bias and discrimination introduces further complexity. The accessibility of various sites, research interests and goals, available technologies, and even a nation's wealth can all contribute to disparities in environmental research (Chapman et al., 2024). According to the research of Chapman et al. (2024) on the existing unequal distribution of biodiversity data, high-income countries have seven times as many observations per hectare as other countries. Moreover, data collection and analytical processes can unintentionally reflect and amplify existing societal prejudices. This can manifest in various ways. For example, if algorithms are trained on datasets that underrepresent certain demographics, the resulting AI systems may produce discriminatory outcomes (Sanchez et al., 2024; Jalli, 2024). As an example, if data sets used to assess environmental risks do not properly account for the needs of marginalized communities, policies developed based on these datasets may disproportionately harm these groups. This goes against the principles of equality and non-discrimination, which are enshrined in international human rights instruments such as the UDHR and the International Covenant on Civil and Political Rights (ICCPR). These instruments guarantee that all individuals are equal before the law and are entitled to equal protection.

c) Suppression of Dissent and Democratic Participation

The potential for big data technologies to suppress dissent and limit public participation is particularly concerning. Through the use of data analytics, biometric tools and predictive surveillance, governments and corporations can monitor individuals and groups critical of their policies or practices, often in opaque and unaccountable ways. This creates a climate of fear that stifles dissent, especially in environmental advocacy

and rights-based activism. Such surveillance can facilitate intimidation, harassment, and even legal or administrative actions against environmental defenders, journalists, and civil society leaders (Thiện, 2023). These tactics directly contravene the rights to freedom of expression and participation in public affairs, which are essential for effective environmental governance and the realization of broader human rights. For example, in Cambodia, digital surveillance (Muntarbhorn, 2022; France-Presse, 2022) has reportedly been used to track journalists and environmental groups, contributing to broader crackdowns. The case of Gerald Flynn, a journalist known for his critical reporting on environmental issues and human rights, being denied re-entry to the country illustrates how data-driven state monitoring and border control systems can be used to identify and target dissenters (Rising and Cheang, 2025). This goes beyond traditional forms of press repression, as modern border surveillance often relies on integrated data systems that include biometric profiling, social media monitoring, and risk scoring. Such practices raise significant concerns under the UDHR and ICCPR, both of which guarantee the rights to freedom of opinion, expression and movement.

d) Misuse of Data and the Chilling Effect

The potential for the misuse of data and the chilling effect it produces poses serious risks to human rights and democratic participation. When data collected for one purpose is repurposed without consent – such as for surveillance, profiling, or intimidation – it raises serious ethical and legal concerns. One consequence of pervasive data monitoring is the phenomenon known as 'social cooling', which refers to the self-censorship and behavioral restraint that occur when individuals are aware they are being watched or tracked. In other words, people become less open in expressing themselves by avoiding controversial topics, limiting their online activities, or refraining from engaging in public discourse due to fear of the repercussions. This chilling effect can undermine free speech, discourage political participation, and erode trust in institutions. For instance, in Thailand Strategic Lawsuits Against Public Participation (SLAPP) have been increasingly used to target environmental journalists and activists. While not driven solely by digital surveillance, these lawsuits operate in a broader ecosystem of intimidation, where digital monitoring can amplify the fear of being targeted. As a result, many media professionals and advocates engage in self-censorship to avoid legal or reputational risks (Supratya, 2024). This atmosphere of fear and restraint is deeply damaging to civil society, freedom of expression, and the healthy functioning of a democratic system.

e) Inaccuracy of data

The fundamental challenge of data quality and its impact on human rights cannot be overstated. The reliability of big data analysis hinges on the quality of the data itself. Poor data quality can lead to skewed results and flawed decision-making. For instance, if environmental monitoring data is collected primarily from easily accessible areas, it might fail to capture the full extent of pollution in more remote or marginalized communities, thus violating their right to a safe and healthy environment. This is also connected to the right to non-discrimination and equitable treatment since unequal data collection and analysis can exacerbate existing social and economic disparities. There is a 'garbage in,

garbage out' principle that shows that poor quality data inevitably leads to poor insights and possibly harmful outcomes. For instance, approximately 340,000 tonnes of untreated fluid waste were dumped into the Citarum River of West Java every day, making it one of the polluted rivers in the world, but hidden discharges have been reported, making it difficult to monitor (United Nation Development Programme, 2024). Enterprises may also selectively monitor areas with favorable water quality while ignoring potential problem areas (United Nation Development Programme, 2024). This is further compounded by the fact that human rights-related data is often imperfect due to collection challenges. This poses a significant risk to the effectiveness of big data in upholding human rights.

f) Labor Abuse

Last but not least, it is important to consider that the development of big data technologies may also involve labor abuses. The training of algorithms can be a labor-intensive process that may lead to violations of labor rights. As an example, tech companies have been criticized for paying very low wages to thousands of young people in the Philippines and other workers in the Global South to label data that is used to train algorithms (Tan and Cabato, 2023). Sometimes the payments are delayed, reduced or even cancelled after tasks are completed (Tan and Cabato, 2023). This highlights how the process of using big data can itself be implicated in human rights violations. In short, while big data technologies offer great potential for promoting human rights and sustainable development, they also carry substantial risks if not properly managed.

Safeguards and Recommendations

Proposed safeguards and recommendations for the intersection of big data, environmental monitoring, and human rights require a multi-faceted approach, integrating robust data governance and legal frameworks, ensuring transparency and accountability, prioritizing data privacy and security, promoting inclusivity and participation, adhering to strict ethical considerations, and implementing thorough human rights due diligence.

Data governance and legal frameworks are foundational to responsible implementation. Harmonizing data protection regulations across Southeast Asia is essential, addressing current inconsistencies that lead to uneven safeguards against data biases and discrimination. This includes establishing clear legal safeguards against data misuse, ensuring that data collection and usage align with established ethical and legal standards. Furthermore, the development and implementation of ethical AI policies are crucial for ensuring transparency and accountability in algorithmic decision-making. The need for strong scientific and ethical standards cannot be overstated, providing a robust foundation for responsible innovation.

Transparency and accountability mechanisms are vital for preventing the misuse of big data technologies. Ensuring transparency in data collection and usage builds public trust and fosters civic engagement. Independent oversight bodies are necessary to prevent the misuse of big data for surveillance or repression, providing an external check on both governmental and corporate actions. Additionally, clear legal frameworks that protect

freedom of expression are essential to prevent the suppression of dissent and ensure that individuals can voice concerns about environmental issues without fear of retaliation.

Data privacy and security must be prioritized to protect individuals from unauthorized tracking and profiling. Informing the public and consulting with affected communities about data practices promotes transparency and enables individuals to make informed decisions about their data. Using the least intrusive means possible for data collection minimizes the risk of privacy violations and ensures that only necessary data is gathered. Data anonymization techniques and secure data storage protocols are critical for protecting sensitive information and preventing unauthorized access. Establishing clear guidelines for data collection, storage, and use helps to ensure that data is handled responsibly and ethically. It is also important to be mindful of the "creep factor" of big data, recognizing that seemingly innocuous data collection practices can lead to significant privacy infringements over time.

Inclusivity and participation are essential for ensuring that big data initiatives benefit all members of society. Inclusive data collection strategies that actively involve underrepresented communities are necessary to ensure that their needs and perspectives are accurately reflected in environmental policies. Promoting digital literacy and access helps to bridge the digital divide and empowers individuals to engage with big data technologies and participate in environmental governance. Ensuring meaningful stakeholder participation in environmental policymaking allows for diverse perspectives to be considered and promotes more equitable and sustainable outcomes.

Ethical considerations must guide the development and implementation of big data technologies. Balancing innovation with human rights protection requires careful consideration of the potential impacts of big data on privacy, freedom of expression, and other fundamental rights. Prioritizing human rights and data ethics ensures that ethical principles are at the forefront of decision-making (Roumate, 2020). Promoting trust in the online environment is crucial for fostering public confidence in big data initiatives and encouraging participation in environmental monitoring. Additionally, it is important to carefully consider whether the benefits of using big data for human rights monitoring outweigh the risks to privacy and other rights.

Human rights due diligence is necessary for corporations to identify and mitigate potential adverse impacts of their data practices. Corporations must assess how their data policies and practices may impact human rights, ensuring that they are not contributing to violations. Meaningful consultation with affected communities is essential for understanding their concerns and incorporating their perspectives into corporate decision-making.

Additional recommendations include capacity building for local communities to engage with big data technologies, empowering them to use these tools for environmental monitoring and advocacy. Promoting regional linkages and international cooperation facilitates the sharing of best practices and the development of common standards for responsible data governance. Supporting civil society organizations in ensuring human rights safeguards in AI strategies strengthens oversight and accountability.

Conclusion

This chapter reveals a dual narrative, highlighting both the powerful potential and inherent risks of employing big data in environmental protection. Big data analytics significantly foster improved resource management, enhance environmental monitoring capabilities and greater transparency in environmental governance, and also reduces disaster risks which can be critical to preventing human rights abuses. This technology enables real-time tracking of pollution, identifies contamination sources, and predicts future environmental risks, all of which contribute to a more proactive approach to environmental protection. These advancements offer unparalleled opportunities to protect and advance a range of human rights. At its core, big data has the potential to directly bolster the right to a clean and healthy environment, ensuring that communities have access to safe air and water by tracking and addressing pollution in real-time. This capability directly supports the right to health, as the rapid identification and mitigation of environmental risks can minimize related illnesses and health emergencies. Big data also enhances the right to information, by providing real-time and accurate data on environmental conditions to the public, promoting transparency and accountability. Moreover, these technologies contribute to the right to life and security, as sophisticated data analysis enhances disaster management and emergency responses. By exposing patterns of environmental damage and their links to societal inequalities, big data technologies can contribute to the principles of environmental justice, supporting the equitable distribution of environmental benefits and burdens. Environmental monitoring, facilitated by these technologies, enables governments and organizations to monitor compliance with environmental regulations, promoting transparency and accountability among state and private actors.

However, the adoption of big data for environmental monitoring is not without its perils. The immense power of these technologies raises significant human rights concerns. Perhaps the most pressing is the right to privacy, given the potential for mass surveillance and misuse of personal information. The use of satellite surveillance, IoT sensors, and even citizen reports can lead to the inadvertent collection of personal data, enabling unauthorized tracking, profiling, and commodification of data by private entities. This issue is exacerbated by the fact that data protection laws across Southeast Asia vary greatly and may not be comprehensive enough to safeguard personal information from misuse. Another salient concern is discrimination arising from biased datasets, which can reflect existing societal prejudices and lead to skewed environmental policies that disproportionately impact poor countries or marginalized communities. Big data technologies can also inadvertently contribute to the suppression of dissent and democratic participation, as surveillance tools and data analytics can be misused to target environmental activists and journalists critical of state or corporate actions. This may risk exposing whistleblowers to retaliation. The use of laws and intimidation tactics to silence dissent can have a chilling effect on public discourse and civic engagement. Furthermore, the potential for inaccurate data and the labor rights violations that occur in training algorithms also demonstrate the diverse risks associated with the use of big data for environmental monitoring.

Therefore, it is critical to approach the adoption of big data in environmental monitoring through a human rights lens, integrating technological innovation with robust legal frameworks, participatory governance, and inclusive policymaking. The need for harmonized data protection regulations and ethical AI policies across Southeast Asia is pressing. Transparency and accountability must be embedded in data collection and usage practices, ensuring that independent oversight bodies monitor the deployment of these technologies. Mechanisms for data anonymization, secure storage, and meaningful consultation with affected communities are critical to protecting privacy. Moreover, inclusive data collection strategies, promoting digital literacy, and involving marginalized communities in environmental decision-making processes are key to promoting inclusivity. Corporations must engage in human rights due diligence processes and assess how their data policies might impact human rights. This requires not only a thorough understanding of the risks but also a proactive approach to mitigate such risks through meaningful engagement with affected communities.

In sum, while big data technologies offer unprecedented opportunities to advance environmental sustainability and human rights, their deployment requires a careful and balanced approach. This chapter navigates these complex issues, examining the potential benefits while simultaneously highlighting and addressing the risks to ensure that the pursuit of environmental sustainability serves, not undermines, fundamental human rights in Southeast Asia.

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CHAPTER 3

What Do the Non-Economic Impacts of Climate Change Loss and Damage Reveal about Human Rights and the Sea-level Rise in the Philippines?

Noe John Joseph E. Sacramento[12, 13, *]

Abstract

With both slow- and rapid-onset loss and damage in vulnerable communities brought about by climate change , we cannot help but ask: Where do we situate the discussion of human rights in this pressing issue today? This chapter begins with a critical inquiry into how the international community and national governments have responded to climate change over the past decades, and what the evolving discourse on loss and damage (L&D) contributes to this discussion. Focusing solely on L&D risks overlooking deeply rooted issues that go beyond superficial realities and what is visible through the lens of economic determinants, accounting only for what can be observed. The case of small-island communities in the Philippines facing the threat of sea-level rise tells a different story—particularly of how non-economic impacts are traced in changes and obstacles to day-to-day practices, and how these challenges intersect with human rights concerns. Drawing from the case of Batasan and Pangapasan islands in Bohol, Philippines investigated through informal conversations with local residents during field visits and observations—this chapter offers a critical reflection on how human rights can be protected (if not reductively) in the precarious context of communities facing inundation due to sea-level rise. It concludes with recommendations directed at policymakers and advocates at local, national, and global levels, urging them to expand their perspective and approach the issue of L&D, not as narrowly as in past discussions on climate finance, but with a progressive vision that transcends mere economic calculation and observation.

Keywords: *climate change, human rights, loss and damage, non-economic, sea-level rise*

[12] Assistant Professor of political science and public policy at the University of the Philippines (Cebu) College of Social Sciences.

[13] Adjunct Professor of critical policy studies at Chiang Mai University (Thailand) School of Public Policy.
* Corresponding email: nesacramento@up.edu.ph

Introduction

In keeping with the challenge of engaging in both scholarly and practical discussions of the pressing socio-environmental and political issues of our time (Anderson & Delisi, 2011; Bellard et al., 2012), it is important not to overemphasize purely technical and expert-centric narratives (Bertsou & Pastorella, 2017; Coen et al., 2021) when addressing critical issues such as climate change. This chapter argues that climate change impacts extend beyond what can be physically observed on the surface, encompassing dimensions that cannot be seen or touched—those that cannot be quantified, yet are deeply rooted in contextual realities, culture, and socio-political dimensions.

Loss and Damage or L&D, a critical element in contemporary discussions not only in local and national arenas but also in international negotiation platforms, offers insights into the shortcomings of climate finance—specifically, its failure to fully recognize and address the impacts of climate change that are invisible to the naked eye and not easily accounted for through economic modeling or simulations (see Bhandari et al., 2022; Calliari et al., 2020; Durand et al., 2016). The international community might have invested attention in climate change financing that obligated the developed countries to help mitigate and respond to climate change impacts on the Global South; however, the L&D argument puts emphasis on its insufficiency as it focused mainly on the economic response and mitigation mechanisms (Auffhammer, 2018; Long, 2021). Recent L&D discourse has taken the eccentric line of examining the non-economic loss and damage from the impacts of climate change in addition to the already mainstreamed economic L&D (Durand et al., 2016). The dimensions and directions for such not only put a sustainable

It is important to clarify that this discussion is not merely a superficial critique of technocracy and the ideals of expert-based science in policymaking, particularly regarding climate change and its intersection with human rights. Rather, the progressive insights driving this chapter move beyond purely technical knowledge by engaging with the non-economic aspects of L&D. While several previous works that examine non-economic L&D have shown that climate change impacts are deeply embedded in the intangible, vulnerable, and sensitive fabric of society and community life, this study raises a critical question: when this highly vulnerable social fabric is impacted by L&D, how are human rights affected, and in what ways does L&D contribute to the curtailment of rights? Although climate finance aims to support vulnerable communities and sectors experiencing adverse impacts of climate change, there remain aspects of community and social life that experience lasting harm which is not accounted for. While a significant body of literature examines climate change (e.g., Anderson & Delisi, 2011; Auffhammer, 2018; Bellard et al., 2012, etc.), L&D remains a relatively new discourse, and the connections between L&D and human rights remain underdeveloped in discussions in the literature.

The following discussion seeks to better understand how climate change L&D intersects with, and transcends, human rights concerns in vulnerable sectors, particularly among local small-island communities (Srebrnik, 2004; Venn, 2017). In the case of the Philippines—a developing nation—those living in remote, off-grid, and geographically isolated areas are already disadvantaged in terms of access to basic human rights (Valdez,

2022). When confronted with disasters and the impacts of climate change-related L&D, these communities become even more disadvantaged and vulnerable. The critical perspective presented in this chapter draws on the experiences of small-island communities in Bohol, the Philippines, and argues that in the face of climate change L&D, protecting the rights of local people, sectors, and communities is both urgent and essential—especially when viewed through the lens of the non-economic aspects of L&D.

The climate change loss and damage nexus: How have we responded so far?

To acknowledge the reality of climate change and the need to respond through financing mechanisms for developing countries most affected by its impacts has long been emphasized by critics, practitioners, and communities directly experiencing these on-the-ground realities. Much of the focus in recent decades has been on adaptation measures, with responses largely channeled into financing mechanisms intended to address the vulnerabilities of Global South countries—both developing and underdeveloped—that have limited capacity to combat such impacts (Ciplet et al., 2013; Ojha et al., 2016). While climate finance has become the dominant approach to addressing these challenges, it has often failed to grapple with the complexity of climate issues or to disentangle the interwoven dimensions that undermine meaningful and just responses (Bracking & Leffel, 2021; Griffith-Jones et al., 2020).

The emergence of L&D discourse over the past decades has shifted the focus more critically toward the context of developing and underdeveloped nations, particularly in the Global South. The most recent Climate Risk Index (CRI) report by Germanwatch (2025) highlights how these countries are disproportionately affected. From 1993 to 2022, the CRI rankings reveal stark geographical inequalities: South and Southeast Asia, Central America, the Caribbean, and parts of Sub-Saharan Africa rank among the most affected, facing recurrent extreme weather events such as typhoons, hurricanes, floods, and droughts. Nations such as the Philippines, Bangladesh, and Myanmar consistently appear in the highest-risk categories, underscoring their acute vulnerability to both rapid- and slow-onset climate impacts. By comparison, wealthier regions such as North America and Europe also register significant risks, though these are often tied to discrete disasters—hurricanes, wildfires, or heatwaves—rather than chronic vulnerabilities. Several countries in Northern Europe and South America rank lower, reflecting comparatively fewer climate risks. These findings underscore the disproportionate burden borne by developing and small-island nations, which contribute the least to global greenhouse gas emissions yet face the gravest consequences of climate change.

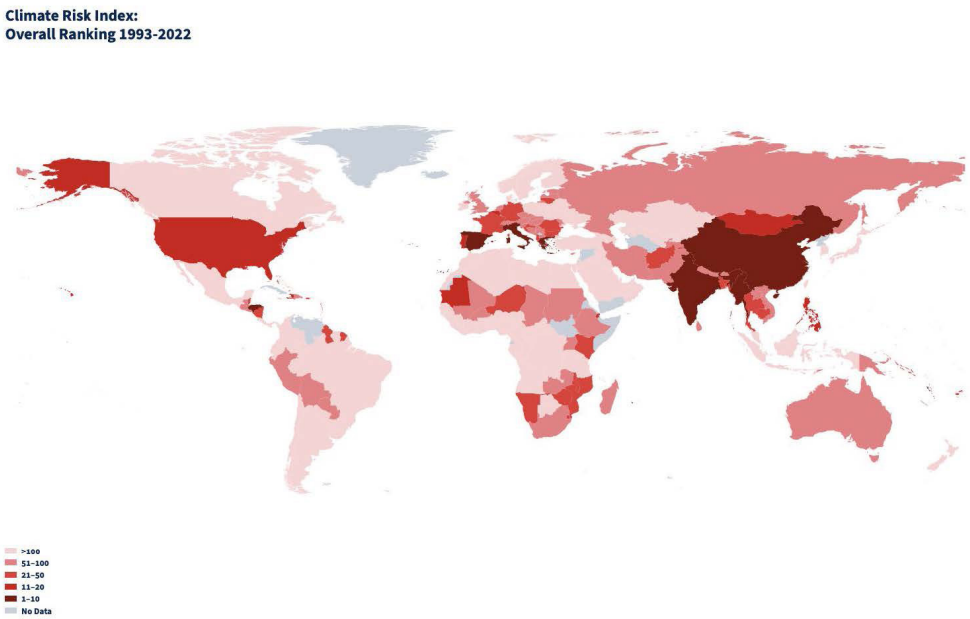

Figure 1. Climate Risk Index (overall ranking 1993 to 2022).

Source: Germanwatch (2025)

The CRI results have fueled ongoing discussions within the Conference of the Parties (COP) negotiations (Demiralay et al., 2025). While the global push for consideration of L&D is crucial to account for climate impacts on those already suffering and the appropriate responses, a deeper question arises: how do human rights intersect with this debate? This is a critical dimension that must be taken seriously. A human rights lens necessarily broadens the conversation into the domain of climate justice, which provides the ethical and political foundation of the L&D discourse (de Jong, 2024; Kaklauskaite & Streimikiene, 2024). At its core, L&D is framed by questions of fairness, responsibility, and historical accountability—issues that expose the unequal distribution of climate burdens and the inadequacy of existing mechanisms for redress.

A growing body of work now emphasizes the non-economic dimensions of climate-induced loss, shifting attention to the lived experiences of vulnerable populations (Sacramento, 2023; Sacramento & Chaiyapa, 2024; Serdeczny et al., 2016). There has been scholarship documenting how communities experience climate impacts in everyday life, from food insecurity and displacement to psychological and social disruptions. Similarly, some of these works have criticized conventional metrics that neglect cultural, emotional, and spiritual harm, proposing instead a values-based approach to capture these realities (Buhaug & von Uexkull, 2021; Calliari et al., 2020; Ojha et al., 2016). One study in Senegal, for example, demonstrated how sea-level rise not only causes material displacement but also dissolves land-based identities, a disservice to the community and to human rights (Thiam et al., 2021). These cases resonate with the situation in the Philippines, where

non-economic manifestations of climate change L&D reveal deep interconnections with community life and the rights of people living in those communities (Jamero et al., 2017, 2019). Faced with the threat of rising sea levels, vulnerable nations risk losing not only occupational and cultural identity but also experiencing the slow disintegration of the social fabric (Nicholls, 2011; Nicholls et al., 1999). At the same time, these conditions cut across human rights: the right to live in peaceful spaces, the right to life—not only individual but collective—alongside cultural attachments, and the right to remain in ancestral places where forefathers shaped the community's unique identity (Humphreys, 2010; Nurhidayah, 2021; Williams, 2012).

The responses to L&D caused by slow-onset events like sea-level rise, deserve the same attention as with rapid disasters, particularly because their cumulative effects are deeply rooted in non-economic domains that erode vulnerable communities' aspirations for justice and equity (Balzter et al., 2023). The most vulnerable communities are found in the Global South and developing countries, and those most at risk—and most difficult to support—are those with the least resources and capacities to respond (Anderson & Delisi, 2011; Sacramento, 2023; Williams, 2012). It is therefore necessary to understand that such crises are not linear problems of environmental change and human activity alone. Rather, they represent complex interactions of multiple actors, reasons, and conditions, constituting a transnational issue of inequality and a profound gap between rich and poor nations that obstructs access to just human rights for communities in the midst of this crisis.

As far as the international community's response is concerned, various mechanisms have placed response and adaptation measures at the cornerstone of the agenda, with financing schemes introduced to mitigate impacts and address immediate concerns while providing pathways for countries to adapt (Benjamin et al., 2018; Martyr-Koller et al., 2021; McDonnell, 2023). However, as mentioned, these measures do not address the totality of the problem—nor the full scope of the L&D crisis—as most responses have remained overly focused on the economic dimension while neglecting the non-economic. Critics argue that current adaptation policies fail to address non-economic loss and, in turn, worsen the already fragile state of human rights in vulnerable sectors (La Viña & Gamboa, 2022; La Viña & Reyes, 2022). Likewise, scholars expand this argument from a justice-oriented framing, highlighting how community voices are excluded from global policymaking, thereby exposing procedural and distributive gaps, and stressing that lived experiences must guide climate responses that aim to address irreversible losses and systemic injustices.

Beyond the economic lens: Understanding non-economic impacts

This chapter posits that the broad discourse on climate change has considerably evolved, from early claims for compensation to its eventual recognition under the United Nations Framework Convention on Climate Change (UNFCCC). The establishment of the Warsaw International Mechanism in 2013 and the inclusion of Article 8 of the Paris Agreement signaled a partial institutional success in legitimizing L&D (Boyd et al., 2017, 2021). Yet, despite these developments, legal and financial frameworks remain

underdeveloped, with no binding provisions on liability or finance. This continuing gap is of particular consequence for Southeast Asia, one of the most climate-vulnerable regions in the world. As La Viña and Reyes (2022) stress, countries such as the Philippines, Myanmar, and Thailand are especially susceptible to both rapid- and slow-onset events, with marginalized populations bearing disproportionate burdens.

The persistent dominance of economic framing within the L&D discourse has led to an overemphasis on financial compensation. While this remains important, it is insufficient to capture the full scope of climate-induced harm. An economic perspective prioritizes what can be measured and quantified, while sidelining irreversible intangible losses that escape calculation (Chiba et al., 2019; Preston, 2017). This reductionist approach narrows the discourse and undermines claims for justice. It is therefore necessary to look beyond economics and recognize that human rights are an essential dimension of L&D (Humphreys, 2010). Human rights provide the ethical and political foundation of climate justice, allowing L&D to be framed not only as a question of financial liability but also of fairness, dignity, and historical responsibility. A hybrid framework blending reparative, distributive, and recognition justice, resonates with the lived experiences of Filipino islanders whose struggles extend far beyond financial restitution. Similarly, Balzter et al. (2023) emphasize that climate burdens fall most heavily on low-emitting communities, reinforcing the need to broaden the scope of response.

When the non-economic dimensions of loss are not accounted for, the impacts of climate change are misrepresented and incomplete. Communities may receive compensation for lost or damaged property or disrupted livelihoods, but financial mechanisms cannot address cultural loss, psychological harm, or the disintegration of the social fabric. In light of this, rising sea levels threaten not just occupational practices and sources of livelihood, but also ancestral ties and cultural attachments embedded within small-island life. To exclude these dimensions is to risk silencing the lived realities of vulnerable populations. Hence, there is a need for caution in dealing with the narratives that have long been put forward and normalized in development practice, as these might end up marginalizing those most affected, narrowing the discourse to a set of technical solutions and thereby weakening claims for justice. By failing to incorporate non-economic impacts, global policy processes reinforce procedural and distributive gaps and miss the opportunity to situate responses within broader questions of recognition, identity, and equity.

The interconnection between non-economic losses and human rights is hence direct and undeniable. When rising seas displace communities, what is lost is not only physical land but also cultural heritage, memory, and continuity (Martyr-Koller et al., 2021). Rights to adequate housing, food security, cultural identity, and participation in decision-making processes are compromised when intangible harms are ignored. This has been emphasized in several studies that emphasize that localized narratives must inform policy to ensure equity (Sacramento, 2023; Sacramento & Chaiyapa, 2024; Serdeczny et al., 2016). Others emphasize that adaptation measures must remain accountable to the communities they serve (La Viña & Reyes, 2022). Human rights thus operate as the central

lens through which non-economic harm can be recognized and addressed. Neglecting this intersection has severe implications. Aggressive adaptation measures, such as forced relocation, may inadvertently intensify vulnerability by fracturing social cohesion and undermining cultural identities. This resonates strongly in the Philippine context, where resettlement programs and disaster responses have sometimes prioritized short-term infrastructural interventions over culturally grounded, people-centered solutions (Fernando & De Silva, 2025; Ngulube et al., 2024). By foregrounding human rights, these unintended consequences can be critically interrogated and avoided.

By paying attention to the non-economic dimensions of climate-induced harm, the L&D discourse deepens its analytical reach. As Boyd et al. (2017), Calliari et al. (2020), and James et al. (2014) noted, these intangible domains—psychological, cultural, and existential—are central to understanding how climate change L&D unsettles communities. Furthermore, the role of attribution science has incessantly highlighted evidence linking anthropogenic climate change with localized harm. Yet, such attributions cannot remain solely technical (Ojha et al., 2016), as it is also necessary to go beyond and extend to questions of justice by recognizing those harms that evade financial valuation. This reorientation prevents affected communities from being reduced to passive subjects of technical assessments, but are instead empowered to acknowledge their agency, histories, and contributions to global climate debates.

This chapter advances the argument that examining the human rights situation as evidenced in changes in community life, progressive disturbance to social well-being, and governmental responses that undermine cultural and social cohesion substantiates claims of L&D and enriches the discourse on the non-economic, which is increasingly central to L&D. The erosion and depletion of natural resources should no longer be viewed merely as derived from aggressive development and modernization but must also be attributed to global climate change impacts that incapacitate smaller and vulnerable communities. This perspective establishes why the non-economic and human rights dimensions cannot remain peripheral in the L&D debate. To focus exclusively on the economic is to overlook the deeper systemic injustices at stake and to misrepresent the nature of harm experienced by vulnerable communities. Human rights and non-economic losses are not supplementary to but constitutive of the L&D discourse itself. In the succeeding parts of this chapter, the discussion turns to a grounded case study that illustrates these arguments in lived reality. The small-island vulnerability to sea-level rise in the Philippines will be viewed the intersection of climate-induced loss and human rights and how this makes visible the implications to cultural identity, social well-being, and community resilience.

Sea-Level Rise and Small-Island Vulnerability in the Philippines

This section turns to the case of Batasan and Pangapasan Islands in Bohol, Philippines to ground the discussion of sea-level rise and small-island vulnerability within the broader discourse on climate change L&D. The focus on these island communities underscores how slow-onset climate events—particularly sea-level rise—extend far beyond physical and economic losses, cutting deeply into the social, cultural, and human

dimensions of community life. In contexts such as these, vulnerability is measured by not only damaged infrastructure or reduced livelihoods but also by the disintegration of cultural identity, the weakening of social cohesion, and the erosion of basic rights (Barbehön, 2020; Pettenger, 2016).

These experiences illustrate how the discourse on non-economic L&D is inseparably interconnected with human rights, particularly the rights to adequate housing, access to resources, cultural continuity, and the ability to remain in ancestral lands (Taylor, 1997; van Hulst et al., 2025). Situating small-island experiences within this framework highlights why responses to L&D must extend beyond financial mechanisms and technocratic adaptation measures to include a more holistic recognition of intangible and irreversible harm. By engaging with the lived realities of vulnerable communities in Bohol, this section demonstrates how the climate change–human rights nexus reveals the inadequacy of current approaches and why embedding human rights into the L&D discourse is essential for pushing toward more just, sustainable, and responsive forms of action from local, national, and international actors alike (Lloyd-Smith, 2022).

The Case of Batasan and Pangapasan Islands in Bohol, Philippines

In Bohol province, two small island barangays—Batasan and Pangapasan—have drawn attention in discussions on climate change because of their acute exposure to sea-level rise. These islands regularly experience inundation during king tides, when the sea swallows homes, schools, and community spaces. For residents, these are not isolated events but recurring realities that compromise their safety and undermine their ability to lead dignified lives. The situation is an example of how slow-onset climate events are experienced in daily life, creating a precarious environment where the line between ordinary events and crises becomes increasingly thin.

The vulnerability of these islands is shaped not only by geography but also by structural disadvantages. Communities here have limited access to infrastructure, health services, and reliable water supplies, while livelihoods rely heavily on fishing—an occupation threatened by changing marine ecosystems and erratic weather. For women, children, the elderly, and the poorest households, the risks are magnified. They are least able to cope with displacement, income loss, or the strain on already scarce resources. These dynamics demonstrate that the impacts of sea-level rise extend far beyond economic damage, cutting deeply into human rights such as access to food, safe housing, cultural continuity, and community security. And while resilience may often be romanticized and framed as devised coping strategies usually expected in risk prone context, these practices may illustrate and are sometimes mistaken for invulnerability. Community efforts cannot fully compensate for systemic neglect and the absence of adequate support from state and international actors. Without recognition of their rights and circumstances, these communities remain trapped in cycles of vulnerability.

Figure 2. Photos from the islands suffering from sea-level rise in Bohol, Philippines.

Source: NHK World Japan (2023)

Batasan and Pangapasan are also exposed to the inequities of global climate politics, and a superficial kind of effort to mitigate, respond to, and adapt to climate change impacts. The islanders contribute minimally to global greenhouse gas emissions, yet they endure some of the most severe consequences of climate change. Their struggles underline the moral and political failures of international mechanisms that prioritize financial instruments while neglecting justice-based approaches (Esty & Moffa, 2012; Hale, 2010; Keohane, 2015). And while various programs often channel funds into infrastructure repair or economic recovery, they rarely address intangible and irreversible harms. The most profound impacts are not only destroyed houses or declining incomes, but the gradual disintegration of social bonds and cultural identity. To ignore these dimensions is to misrepresent the nature of loss and to deny justice to those most affected. Embedding human rights within the L&D discourse is therefore not optional but necessary (Humphreys, 2010). It ensures that discussions address fairness, dignity, and recognition, rather than focusing narrowly on compensation and infrastructure.

In field visits, group discussions with residents, and local observation, this study confirms that the losses that communities experience cannot be reduced to financial terms. Residents describe how flooding erodes not only homes and livelihoods but also ancestral ties, cultural practices, and the sense of belonging tied to the land, as well as the identity in the community which they and their foreparents have built. These are forms of non-economic L&D that strike at the heart of community identity. In Batasan and Pangapasan, to lose land is also to lose heritage, memory, and the connections to the forebears who shaped the islands. Such harm cannot be compensated monetarily; it reveals the inseparable intersection between climate change, L&D, and human rights. Batasan and Pangapasan are a reminder that these island communities reveal how the non-economic

and human rights dimensions of L&D are inseparably linked, and why recognizing them is vital for shaping just, sustainable, and responsive action. Their experience grounds the broader discourse in lived reality and provides the foundation for the next discussion on sea-level rise and small-island vulnerability in the Philippines, where the intersection of climate change and human rights will be further explored.

Risks and the vulnerable in the island communities

In Pangapasan and Batasan, the story of sea-level rise and its threat to daily life is never told in isolation—it is lived and retold through the struggles of the youth, the elderly, and the women who hold together the fabric of the community. Their vulnerabilities are not just economic in nature, but cut deeply into the intangible spaces of culture, dignity, and identity (Adrianto & Matsuda, 2004; Encontre, 1999; Pelling & Uitto, 2001). What is being lost is measured not merely in damaged property or diminished incomes, but in the erosion of the very social bonds and life-worlds that sustain them.

The youth, standing at the threshold of possibility, find themselves facing an uncertain horizon. For students, the regular flooding of schools and learning spaces disrupts their formative years. Desks, books, and classrooms become casualties of the tides, and the rhythm of education is broken by displacement and temporary closures. The dream of securing a future on the island—whether through fishing, farming, or new forms of livelihood—becomes clouded. Career opportunities dwindle as the sea encroaches, leaving fewer prospects to sustain their aspirations. This frustration breeds a sense : that growth and self-fulfillment must inevitably be sought elsewhere. Young people migrate to the mainland, searching for work and education, and with them goes a part of the island's cultural continuity. Songs, rituals, and inherited practices lose their carriers. The non-economic losses here are palpable—not just of opportunities but of identity, of the very possibility of sustaining community traditions into the next generation.

The elderly, in contrast, embody the memory of the islands. They are the keepers of oral histories, traditions, and values, yet they are the most physically vulnerable to the rising waters. Their daily subsistence has always relied on small backyard gardens and subsistence fishing, but soil salination and unpredictable tides have made these sources unreliable. Care of the elderly, already fragile due to limited health infrastructure and the economic isolation of island life, is pushed further to the margins. For older residents, each super typhoon or prolonged flooding event is not just another hazard—it is a direct assault on their sense of well-being and security. Moreover, as extended families struggle to cope with resource scarcity, traditional practices of caring for elders are tested. The strain of prioritizing children's education, a daily supply of food, and rebuilding efforts often leaves older members of the community increasingly neglected. For a culture that esteems family solidarity, this quiet unraveling is perhaps one of the most painful non-economic losses, shaking the very core of community life.

The burdens of L&D are deeply gendered. As caretakers, providers, and protectors, women bear the compounded responsibilities of sustaining families in conditions

of scarcity. Flooding and sea intrusion have rendered homes unsafe and sanitation inadequate, forcing women to contend with illnesses linked to contaminated water and poor hygiene. The roles they occupy, both reproductive and productive, become more difficult under the pressures of climate change: tending to children, caring for the sick and elderly, managing scarce food and water, while also trying to contribute to household income. Women describe how repeated flooding erodes not just their physical spaces but also their sense of safety and security. The risks of disaster weigh heavily, as they worry about the protection of children and the safety of their families during evacuations or prolonged inundations. The physical insecurity brought by floods extends to emotional strain, testing their resilience in ways that cannot be quantified in monetary terms.

These interwoven experiences reveal a pattern of loss that cannot be captured by financial metrics. The youth lose their sense of belonging and future on the island; the elderly lose security, recognition, and the assurance of care; women lose stability in the home and bear disproportionate burdens of sustaining families amid crises. Each story demonstrates that the impacts of sea-level rise penetrate deeply into non-economic domains: education, health, dignity, cultural identity, family life, and social cohesion. They constitute forms of harm that are irreversible and immeasurable. These vulnerabilities as manifestation of the non-economic impacts of L&D offer critical insight into the broader discourse, as it shows that climate change is not only an environmental crisis but also a social and ethical one, where rights and justice are at stake (Lai et al., 2022; Nand & Bardsley, 2020). In these stories of vulnerability, we find the strongest argument for why human rights must be at the heart of the L&D discourse (Nurhidayah, 2021; Venn, 2017), ensuring that responses are not only effective but also just, equitable, and attentive to the lived realities of those most at risk.

Human rights and climate change loss and damage

When the stories of vulnerability from the youth, women, and elderly of Pangapasan and Batasan are placed in the context of human rights, the implications become even more pronounced. Non-economic losses are not peripheral but central to understanding justice in the age of climate change. The erosion of community life, the weakening of intergenerational ties, and the undermining of cultural continuity all underscore why the L&D discourse must move beyond economic calculations and confront the unaccounted harm that denies the humanity of those most affected and perpetuates inequality in responses (McDonnell, 2023; Preston, 2017; Sacramento & Chaiyapa, 2024). Viewing these realities through a human rights lens makes visible what is often overlooked: the rights of communities to live in dignity, to remain in their ancestral lands, and to carry forward their cultural traditions without the constant threat of erasure (de Jong, 2024; Humphreys, 2010).

In these cases, the intersection of climate change L&D with human rights is not abstract theorization but lived experience. These small-island communities, already facing geographic isolation and fragile local economies, now contend with creeping sea-level rise

that reshapes their physical and social landscapes (Encontre, 1999; Pelling & Uitto, 2001). When examined through the lens of human rights, it becomes clear that the damage caused by climate change extends beyond the visible markers of flooded homes, damaged property, or lost livelihoods (Eckstein et al., 2021). What is undermined are core rights: the right to education, to health and adequate care, to security and dignity, to adequate living conditions, and to cultural continuity. These rights, embedded in international human rights frameworks and manifested in local practices of dignity and community life, reveal how the impacts of climate change directly affect justice and equality (de Jong, 2024; Nurhidayah, 2021; Venn, 2017).

The right to education stands at the forefront of these. For the youth in Batasan and Pangapasan, schooling is constantly interrupted by king tides and floods that submerge classrooms, destroy learning materials, and displace students. The instability of educational spaces disrupts the continuity of learning and weakens the ability of children and adolescents to prepare for futures beyond a life of subsistence (Thomas & Phillips, 2013). In small-island contexts, where opportunities are already limited, education is not only a right but a crucial pathway to break cycles of intergenerational poverty. Each disruption erodes this pathway and deepens inequality (Hinkel et al., 2014; Kanbur et al., 2014; Markkanen & Anger-Kraavi, 2019). Moreover, when youth migrate to the mainland in search of uninterrupted schooling or better employment prospects, the islands lose not only young labor but also the bearers of cultural traditions. The undermining of the right to education thus reverberates far beyond individual trajectories, touching on the sustainability of community identity itself.

The right to health and adequate care is equally imperiled. In these islands, rising seas contaminate freshwater resources, undermine food security, and increase vulnerability to waterborne diseases. For the elderly, whose health needs are greater, the impacts are particularly severe. Many older residents rely on family-based systems of care in the absence of state-provided facilities, but migration of younger generations has eroded these structures. When families are fractured by displacement, the assurance of care and protection for older members collapses. The result is a double burden: diminished access to medical needs due to geographic isolation and weakened community structures that once ensured dignity in aging. This combination exposes the elderly to heightened risks not only of physical illness but also of neglect and social marginalization (Filiberto et al., 2009; Malak et al., 2020; Oven et al., 2012). In the context of L&D, the denial of the right to health is not a matter of future risk but an immediate condition of life that steadily worsens with each flood and each season of scarcity.

The loss of the right to security and dignity is perhaps the most pervasive in these communities. Security is not only about physical safety from storms and flooding, but also about the assurance that daily life can unfold in predictable, safe conditions. In Batasan and Pangapasan, homes are frequently rendered unsafe as seawater inundates dwellings and damages structures. Families live under constant threat, knowing that high tides or storms can erase their shelters overnight. Women, who bear the responsibility for safeguarding children and the household, experience these conditions as acute threats to both physical

and emotional well-being (Denton, 2002). Their dignity is compromised when they are forced to raise families in precarious and unsafe environments. Temporary evacuations during floods or disasters further expose women and children to insecurity in makeshift shelters, compounding their vulnerability. The denial of dignity here is not incidental—it is a structural outcome of neglecting the non-economic dimensions of climate change, where the erosion of safe and habitable spaces strips communities of the very conditions that allow them to live lives of worth (Denton, 2002; Md et al., 2022).

Closely tied to this is the right to adequate living conditions. International human rights instruments affirm that everyone has the right to housing, sanitation, and access to essential resources. Yet in Batasan and Pangapasan, these conditions are persistently undermined by sea-level rise. Flooding contaminates freshwater, leaving families with unsafe drinking water and inadequate sanitation facilities. Housing is weakened by repeated exposure to water and storms, forcing families into cycles of repair and reconstruction that strain already limited resources. Food security is diminished as fishing livelihoods become less predictable and backyard gardening, once a source of supplemental nutrition, becomes impossible due to saltwater intrusion. Adequate living conditions are thus denied in multiple dimensions, with implications that go beyond material deprivation. The failure to guarantee these rights entrenches systemic vulnerability and deepens inequalities between those with the means to leave the islands and those who must remain.

Perhaps the most profound human rights issue in these cases lies in the erosion of cultural continuity and community identity. The right to culture, heritage, and identity is increasingly recognized as fundamental, yet it is often overlooked in climate frameworks that prioritize economic loss (Krupocin & Krupocin, 2020; Roberts & Andrei, 2015). In Pangapasan and Batasan, cultural practices tied to the land and sea—rituals, stories, fishing traditions, and ancestral ties—are threatened by displacement and migration. As young people leave the islands, knowledge systems that depend on intergenerational transfer are broken. The slow disintegration of the social fabric and the weakening of community cohesion represent losses that cannot be measured in monetary terms. They are existential harms that speak directly to the right of communities to remain in their ancestral places and to carry forward their traditions without the constant threat of erasure (Lahoud, 2024; Roberts & Andrei, 2015). The undermining of cultural rights illustrates why non-economic loss must be at the center of the L&D discourse. Without recognition of these intangible dimensions, policy frameworks fail to address the full scale of what is being lost.

Box 1. Lessons from the intersection of human rights and L&D

- Non-economic losses are central to justice. The erosion of access to education, healthcare, dignity, adequate living conditions, and cultural continuity demonstrates that non-economic dimensions of climate impacts are not peripheral but integral to understanding justice in the era of climate change.
- Human rights give visibility to the unseen. Viewing L&D through a human rights lens reveals harm that economic assessments overlook, such as the disruption of intergenerational ties, the loss of cultural identity, and the breakdown of community cohesion.
- Exclusion deepens vulnerability and inequality. When human rights dimensions are absent from policy frameworks, communities are left doubly exposed—to the direct impacts of sea-level rise and to the structural neglect of their intangible losses, perpetuating injustice and marginalization.
- Responsibility extends beyond compensation. Embedding human rights in the L&D discourse reframes global responsibility from narrow financial obligations toward broader commitments to fairness, dignity, and accountability in climate governance.
- Community resilience depends on rights protection. For small-island communities like Batasan and Pangapasan, safeguarding the rights to education, health, security, and culture is not only about survival but about enabling dignity and continuity in the face of irreversible change.

The intersection of L&D with human rights in Batasan and Pangapasan is therefore undeniable. This is not an abstract debate, but the daily reality of the erosion of access to education, healthcare, dignity, living conditions, and cultural continuity. To exclude these dimensions from climate frameworks is to leave communities doubly vulnerable: first to the physical impacts of sea-level rise, and second to the structural neglect of their intangible losses. This perpetuates inequality by recognizing only what can be quantified, while ignoring the lived experiences of those most affected. By contrast, recognizing L&D through a human rights lens brings visibility to what is often overlooked. It affirms that climate change is not only an environmental crisis or economic problem but a human rights crisis that demands justice-centered responses.

Embedding human rights into the L&D discourse also reframes responsibility. It shifts the debate from narrow compensation schemes toward broader questions of fairness, dignity, and accountability (Humphreys, 2010). For communities like Batasan and Pangapasan, this framing is essential. Their struggles demonstrate that addressing climate change requires more than financial transfers; it requires recognition of the full humanity of vulnerable communities, and commitments to policies that uphold their rights to security, dignity, and continuity with their cultural heritage (de Jong, 2024; Nurhidayah, 2021). The human rights lens thus expands the moral and political dimension of the L&D debate,

pushing beyond technical adaptation measures toward actions that are just, equitable, and responsive to the lived realities of those on the frontlines of climate change.

Concluding Points and Ways Forward

The non-economic impacts of climate change L&D in small-island communities such as Batasan and Pangapasan reveal how deeply climate change is interconnected with human rights. What is often counted as invisible or immeasurable—the disruption of education, the weakening of health and care systems, the erosion of dignity and adequate living conditions, and the disintegration of cultural identity—emerges as central to the lived reality of those most at risk. These cases show that climate change is not merely a story of flooded houses or lost livelihoods, but a profound assault on the basic rights that sustain human dignity. By foregrounding human rights in the L&D discourse, it becomes evident that current approaches, overly reliant on economic metrics, have fallen short of capturing the full weight of harm and injustice borne by vulnerable communities.

The lessons are clear. First, L&D must be understood as both an economic and a non-economic issue, where the intangible yet irreversible losses require as much attention as material damage. Second, to recognize these losses through a human rights lens makes visible what is otherwise marginalized, and strengthens claims for justice that go beyond compensation toward dignity, equity, and accountability. Third, excluding these dimensions from climate policy frameworks creates double vulnerability: exposure to the physical impacts of climate change, and structural neglect of non-economic losses. These gaps not only perpetuate inequality but also ignore the lived experiences of those most affected.

Moving forward, there are opportunities for action. For policymakers, the immediate task is to integrate human rights standards into climate frameworks and adaptation planning. This means ensuring that education, health, security, and cultural identity are explicitly recognized and protected in national and local strategies for climate response. Programs must extend beyond financial transfers and infrastructure repair to safeguard the intangible domains of life that sustain community cohesion and cultural continuity. Practical measures may include protecting schools and health facilities in vulnerable zones, developing community-based adaptation programs grounded in cultural practices, and designing relocation policies in a way that prioritizes dignity, participation, and cultural preservation.

At the international level, embedding human rights into L&D discussions can reframe responsibility, moving it away from narrow financial obligations and toward shared commitments to fairness and historical accountability. This includes strengthening mechanisms under the UNFCCC to ensure that the voices of vulnerable communities are not merely consulted but decisively shape policies and financing priorities. By adopting justice-oriented approaches, global governance can move closer to delivering not just assistance, but recognition and redress.

Equally important is the role of research and knowledge generation. Future work must deepen the documentation of non-economic losses, using methodologies that are centered on community narratives, cultural practices, and local histories. There remains a need to develop conceptual and analytical tools that can better capture the intangible dimensions of harm without reducing them to economic proxies. Research should also critically evaluate how existing adaptation measures, including relocation and disaster response, can inadvertently intensify vulnerabilities when they overlook human rights. Such work will not only expand the academic discourse but also provide practical insights for policies that are more equitable and responsive.

The case of sea-level rise in Batasan and Pangapasan demonstrates that climate change is not only an environmental crisis but also a human rights crisis. To address it requires more than technical solutions or financial transfers. It requires a vision of climate justice that takes seriously the lived experiences of vulnerable communities, acknowledges their agency, and safeguards their rights to dignity, security, and cultural continuity. Recognizing the intersection between human rights and non-economic L&D pushes the debate beyond calculation and toward justice—justice that is owed not only in economic terms but in the recognition of humanity itself.

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CHAPTER 4

Human Rights and Flood Disaster Management in Malaysia: A Study of Baling, Kedah

Norafidah Ismail[14]

Introduction

A devastating flood struck several villages in Kupang, Baling District, Kedah, on July 4, 2022, causing widespread destruction. At approximately 4:30 pm, a massive water column from Gunung Inas (Mount Inas) triggered severe flooding in the region (Rosli, 2022). Kampung Iboi (Iboi Village) and surrounding areas suffered the greatest damage, with over 800 homes affected (Rosli, 2022). The disaster resulted in three fatalities, the destruction of 17 houses, and displacement of 3,546 residents. The economic impact was severe, with total losses estimated at RM25.91 million (KeTSA, 2022). The tragedy exposes the vulnerability of communities and reveals the urgent need for a human rights-based approach to disaster management. In times of crisis, basic human rights—shelter, healthcare, safety, and dignity—must be prioritized. Federal and state governments, along with relevant agencies, mobilized resources in response. This article examines disaster relief efforts through a human rights lens, guided by the Universal Declaration of Human Rights (UDHR). It first explores the disaster's location, causes, and its severe impact on the affected communities. Next, it evaluates the response efforts by federal and state governments, along with various relief agencies. The analysis highlights both the strengths and shortcomings of these interventions in addressing human rights concerns.

The Flood in the Kupang Region, Baling District

Deforestation has harmful effects on nature and later on the wellbeing of people. Defined as the permanent removal of trees and conversion of forested land to non-forest use such as agriculture and urban development, deforestation is most commonly found in tropical regions (Folmer & van Kooten, 2006). In the Kupang region, around 600 hectares of forested areas at the peak of Gunung Inas were cleared to make way for the Musang King durian plantation (Ikhsan, 2022). Generally, deforestation activities eliminate the vegetation that acts as a natural water buffer (Azri et al., 2024), supports water retention and stabilizes the soil. Another consequence of deforestation is a decline in the soil's ability to absorb rainfall which consequently causes a greater surface runoff especially during

[14] School of International Studies, Universiti Utara Malaysia

heavy rainfall. Such soil erosion further destabilizes the mountain's landscape. This human activity — deforestation — heightens the flood risk in some areas of Kupang region. (Note: While the Gunung Inas Environmental Impact Assessment report was approved in 2013, the 2022 floods suggest that initial legal compliance does not fully succeed in guaranteeing long-term operational adherence to environmental mitigation measures.)

Flood risks in the Kupang region were significantly magnified by the interaction between environmental fragility and extreme weather conditions. Specifically, three hours of continuous heavy rainfall caused Sungai Kupang (Kupang River) to overflow, sending high-velocity currents into residential areas. This powerful flow triggered a massive debris surge that transported logs, sand, silt, and gravel from Mount Inas, resulting in debris flow phenomena across four main river branches (KeTSA, 2022). These combined mud floods and debris flows proved catastrophic as they reached lowland areas, causing extensive destruction in Kampung Iboi and dozens of other downstream villages.

The flood was a district-wide catastrophe that impacted a substantial portion of Baling District. Official reports indicate that the flooding affected 41 separate areas, demonstrating the extensive geographical reach of the event. Among the most severely impacted locations were Kampung Iboi, Lata Celak, Padang Empang, and Masjid Iboi (Abdul Rahman, 2022). Other areas, such as Bendang Padang, Bendang Bechah, Israi, Hangus, and Bukit Hijau, experienced relatively less severe damage (Abdul Rahman, 2022). The broad distribution of these affected sites suggests that the floodwaters and debris flows extended far beyond the immediate epicenter.

The flood resulted in severe physical destruction and significant human suffering across the Kupang region. This disaster affected 12 villages and caused physical damage to approximately 800 homes, with the most concentrated impacts observed in Kampung Iboi. Within this total, 17 homes were completely demolished and another 18 sustained severe structural damage (Ikhsan, 2022; Rosli, 2022). Beyond property loss, the event displaced 3,546 residents and resulted in an irreversible human cost (KeTSA, 2022). Most tragically, the unprecedented floodwaters swept away and killed three individuals, including a pregnant woman (Rosli, 2023). Consequently, the affected communities faced not only immense physical and economic losses but also lasting emotional trauma from the catastrophe.

Since the July 2022 flood event, residents in Kampung Iboi and the surrounding areas have remained trapped in a repetitive cycle of damage, repair, and renewed loss. This recurring pattern has established a "disaster-recovery-disaster" cycle that hinders long-term recovery and prevents the implementation of sufficient mitigation measures. Beyond the significant economic strain caused by rebuilding, these frequent events have had a profound psychological impact on the affected population. Many victims experience persistent emotional distress, characterized by a constant preoccupation with financial survival and a pervasive fear of future flooding (Azri et al., 2024). This atmosphere of uncertainty and anxiety represents a fundamental erosion of safety and stability, highlighting the deep-seated, disaster-induced trauma that persists within the community.

The flood created an extensive economic burden characterized by significant financial loss and long-term structural damage. Total estimated losses from the event reached RM 25.91 million, encompassing the destruction of private homes, public infrastructure, and agricultural lands, as well as the high costs associated with resident displacement (KeTSA, 2022). The impact on agricultural areas was particularly severe, as it disrupted the primary income streams for many victims and local communities. Beyond the immediate loss of physical assets, these populations face enduring economic challenges as they struggle to rebuild their livelihoods and homes with limited financial resources.

Protecting Human Rights in Flood Emergency Response

The relevant authorities implemented continuous surveillance and monitoring protocols as a central component of disaster preparedness and flood management. Key agencies, including the Royal Malaysian Police (PDRM), the Fire and Rescue Department (JBPM), and the Civil Defense Force (APM), maintained active oversight to identify potential threats during periods of heavy rainfall in the Kupang region (Zakaraya, 2022). This systematic monitoring served a dual purpose: it functioned as a vital safety measure to mitigate uncertainty and acted as a visible assurance of the government's commitment to public safety.

Successful disaster risk reduction relies heavily on the synergy between institutional preparedness and community compliance, particularly during the critical windows of a calamity. To mitigate the life-threatening impacts of flooding, authorities such as the APM and the Chief Minister of Kedah have consistently emphasized the necessity of immediate evacuation when heavy rainfall persists and river levels breach safety thresholds (Zakaraya, 2022). While residents in high-risk zones are urged to maintain heightened situational awareness, a recurring challenge remains the tendency of some individuals to delay relocation until conditions become precarious. Consequently, the district officer — empowered to issue evacuation orders based on real-time assessments — prioritizes those living in immediate proximity to river banks and flood-prone corridors to maximize survival rates (Zakaraya, 2022). Ultimately, the success of such adaptive disaster management frameworks is fundamentally dependent on the public's willingness to prioritize personal safety and strictly adhere to official directives.

In crisis management, the dissemination of real-time information is regarded as a critical survival resource, comparable in importance to food, shelter, and medical supplies. To ensure public safety and facilitate appropriate responses to unfolding disasters, the Malaysian Control Centre of PDRM established a central information hub to provide citizens with timely and verified flood updates. Supplementing this official channel, the government further streamlined emergency communications by launching centralized hotlines and promoting the MERS 999 service to assist those in immediate distress (Berita RTM, 2022). However, the operational efficacy of these communication lifelines is frequently compromised by the physical realities of flooding, such as power outages and the collapse of telecommunication infrastructure. These systemic failures present a

significant barrier to inclusivity, as residents in underdeveloped or remote geographical areas often remain disconnected from these essential services during peak disaster periods.

The coordination of multi-agency responses represents a cornerstone of resilient disaster governance, ensuring a unified and large-scale institutional intervention during environmental catastrophes. A primary example of this orchestrated effort was 'OP Bantu Baling' (Baling Assistance Operation), a state-centered operation led by Kedah Police Chief Commissioner Wan Hassan Wan Ahmad, which synchronized humanitarian aid with emergency rescue missions (Berita RTM, 2022). Under the direction of the Ministry of Home Affairs, various departments — including the Malaysian Volunteer Department (RELA), the Immigration Department, the National Registration Department, the National Anti-Drug Agency, and the Malaysian Prison Department — were mobilized to streamline aid distribution and resource management. While this collective mobilization demonstrated a sense of duty and national solidarity, the strategic deployment of diverse agencies also served to reinforce state visibility and administrative authority amidst the chaos of the crisis.

Rescue operations are often framed from a comprehensive security aspect that demonstrates the state's ability to exercise authority, care, and control during a crisis. By deploying a diverse range of government actors, the state reinforces its presence and provides a visible manifestation of its governance. In the context of flood response, this multi-agency approach was highlighted by the involvement of the PDRM, the JBPM, and the RELA. Each agency provided specialized competencies tailored to the disaster; for instance, the PDRM not only contributed personnel but also mobilized significant material infrastructure, including four boats, eight trucks, and three four-wheel-drive vehicles (Berita RTM, 2022). This coordinated mobilization of both human expertise and physical assets illustrates how various arms of the government work together to maintain public safety and manage environmental emergencies.

The success of the state's Search and Rescue response is largely determined by a combination of professional expertise, inter-state collaboration, and technological integration. During the Kupang region flood disaster, the JBPM demonstrated this by deploying a specialized force of 146 personnel, including senior officers and elite units from the Kedah State Fire and Rescue Department (Berita RTM, 2022). This operation utilized highly skilled teams such as the Water Rescue Team, the Special Tactical Operation and Rescue Team of Malaysia, and a dedicated Drone Unit. The inclusion of drone technology was particularly significant, as it allowed rescuers to monitor the disaster site from the air, locate victims more rapidly, and map out efficient rescue routes (Berita RTM, 2022). Furthermore, the operation highlighted the importance of inter-state cooperation, with additional support units mobilized from Perlis, Perak, and Penang to bolster the local response efforts.

The rapid mobilization of government agencies is critical for minimizing harm to vulnerable populations during a crisis, as evidenced by the immediate deployment of 140 Kedah APM personnel to Kampung Iboi following reports of severe flooding

(Sinar Harian, 2022). This swift action suggests that the APM maintains a structured communication and response framework capable of managing large-scale rescue operations under extreme pressure. Within this framework, 55 personnel executed extensive efforts to relocate and save affected residents; however, the operation also highlighted the inherent limitations of even well-trained search and rescue teams when faced with severe environmental hazards - the dangerous nature of the floodwaters. The response concluded only after the Kedah State Fire and Rescue Department conducted a thorough search to ensure that all missing persons were accounted for, thereby confirming the completeness and closure of the rescue process (Berita RTM, 2022b).

At the core of the Baling flood evacuation process was the fundamental objective of protecting human rights, specifically the rights to life, security, and dignity. This priority was reflected in the coordination between various stakeholders, which, as Superintendent Shamsudin Mamat noted, contributed to a highly efficient evacuation effort (BH Online , 2022). A significant aspect of this operation was the collaboration between the Department of Social Welfare and local villagers, who worked together to move vulnerable individuals, such as the elderly, to safety. This active involvement of the local community highlighted a shared sense of responsibility and social solidarity during the crisis. Furthermore, professional rescue teams like the Wira Merah (fire personnel) utilized their full capacity to relocate 499 victims to temporary shelters (Adnan, 2022). Ultimately, the combined efforts of official agencies and civilians ensured that the safety of all flood victims was maintained equally throughout the emergency.

The systematic management of the Kupang flood disaster reflects a joint approach to emergency response and state resource allocation. Central to this success was the strategic use of a pre-designated infrastructure, where schools and religious centers — specifically SMK Jerai (a public school), Surau An-Nur (a Muslim prayer hall), and SMK Agama Yayasan Khairiah (a religious school) — were converted into temporary evacuation centers (PPS) to provide essential shelter for 1,424 victims from 93 families (BH Online 2022a). A notable achievement was the safe evacuation of 1,008 students from SMK Agama Yayasan Khairiah, the majority of whom were able to return home the following day (Hibrahim, 2022; Zulkiffli, 2022). This operational efficiency was supported by 14 Baling APM personnel who utilized specialized equipment to facilitate rescue efforts (Hamid, 2022). Furthermore, relief agencies maintained public health standards through the timely logistics of providing food, blankets, and pillows (Sinar Harian, 2022a). By integrating dedicated personnel with efficient supply chains, the three-day operation concluded as a successful example of multi-agency cooperation in safeguarding vulnerable populations (Adnan, 2022).

Maintaining public order and regulating access to disaster zones are essential components of relief operation. In the Kupang flood response, the authorities implemented strict security measures to prevent opportunistic behavior, such as "disaster tourism" and "social media loitering," which threatened to diminish the gravity of the crisis (Zakaraya, 2022a). To filter unauthorized individuals from genuine victims, the Royal Malaysia Police established strategic roadblocks at key junctions in Kampung Jerai and

Kuala Kuang (Zakaraya, 2022a). Furthermore, the District Police Chief, Superintendent Shamsudin Mamat, utilized clear communication to issue an informational "nudge," warning that those obstructing official duties could face legal consequences under Section 186 of the Penal Code (Zakaraya, 2022a). Despite these rigid controls, the state demonstrated humanitarian flexibility by allowing victims to return home to retrieve essential items, provided they filed police reports to document damage for future assistance (Zakaraya, 2022a; Kamarudin, 2022b). This balanced approach ensured that the dignity of victims was protected from exploitation for online clout while simultaneously maintaining the operational integrity of rescue teams. These actions also illustrate how law enforcement agencies must navigate the tension between strict security enforcement and the urgent, practical needs of the affected community.

The implementation of a comprehensive public health response by the Kedah State Health Department (JKN) was instrumental in mitigating the secondary health crises often associated with environmental disasters. By establishing a multiple-layered defense system, the JKN prioritized rapid risk identification, evidenced by the detection of a level-two Covid-19 case at Baling Hospital (Hashim, 2022). This discovery underscored the inherent difficulties of managing infection risks in crowded settings, such as PPS. To address these post-disaster epidemiological threats, health surveillance teams conducted integrated monitoring for various conditions, including influenza-like illness, leptospirosis, and waterborne diseases (Hashim, 2022). This decentralized healthcare approach utilized "static clinics" within PPS locations to bring medical services directly to victims, reducing barriers to access while easing the burden on primary hospitals. Furthermore, a specialized 20-member team enforced standardized sanitation protocols to prevent vector-borne disease transmission. By addressing these infectious risks immediately, the state maintained a uniform quality of care that prevented a potential health epidemic.

The Baling District Health Office ensured the continuity of medical care by deploying twelve personnel across three key relief centers: SMK Jerai, SMA Yayasan Al Khairiah, and Surau An Nur (Hashim, 2022). This response utilized a "hub-and-spoke" model of tiered service hours, where the clinic at SMK Jerai provided 24-hour emergency coverage while the remaining sites offered essential daytime services from 8:00 AM to 5:00 PM (Hashim, 2022). Such an approach optimizes limited resources for nighttime emergencies while integrating medical and epidemiological strategies into the broader disaster response. Also, this coordinated clinical presence allowed for immediate health interventions, substantially supporting the community and preventing the escalation of health crises within the displaced population.

Prioritizing psychological well-being alongside physical recovery is essential for fostering emotional resilience in disaster-stricken communities. In response to the Kupang floods, the Kedah JKN deployed a specialized Mental Health and Psychosocial Support Services team, comprising medical experts, counselling psychologists, and education officers (Hashim, 2022). This team conducted individual and group interventions across all relief centers to address the heightened risks of stress, anxiety, and depression among both victims and relief workers. Such clinical support is vital because flood survivors

often face significant long-term mental health challenges, including Post-Traumatic Stress Disorder and chronic depression, which necessitate sustained access to health services (Abid et al., 2025). By offering trauma-informed interventions and encouraging ongoing support at nearby health clinics, the initiative reinforced a community-based resilience framework (Abid et al., 2025; Hashim, 2022). Consequently, integrating mental health services into the immediate disaster response ensures that victims are equipped with the stability required to rebuild their lives and communities.

Human Rights-Based Strategies in Post-Flood Disaster Response

The Malaysian government's diversified intervention in the Kupang flood disaster demonstrates a practical integration of disaster management with the human rights principles established by the UDHR. Central to this recovery framework was the fulfilment of the non-discrimination mandate of Article 2 and the right to security of Article 3, evidenced by the prioritized evacuations by the National Disaster Management Agency (NADMA) and the Baling District Office's inclusive identification of 19 high-risk families for relocation. To safeguard social security under Article 22, the state provided critical financial aid, including RM1,000 per family and RM2,500 for essential goods, while the Rubber Industry Smallholders Development Authority (RISDA) assisted 140 smallholder farmers with replanting resources to ensure economic stability. Furthermore, the government upheld the guarantee of an adequate standard of living of Article 25 through specialized housing projects and business recovery grants. Notable examples include the construction of 12 modern homes in Keda Kampung Sadek — strategically located within five kilometers of the original village to preserve livelihoods — and RM3,000 grants provided by the Ministry of Entrepreneur Development and Cooperatives (KUSKOP) to micro-entrepreneurs. These efforts were bolstered by collaborative missions involving the Higher Education Ministry's Volunteer Mission Team and local non-governmental organizations (NGOs), which facilitated essential clean-up and infrastructure restoration. By combining immediate relief with long-term resettlement strategies, the government transitioned from reactive aid to a rights-based model of sustainable community resilience.

Extensive clean-up

The execution of post-flood recovery operations underscores a shift toward the sanitation and rehabilitation phase, an essential step in restoring community normalcy through the cleaning of public facilities such as schools, surau, and residential homes (Kamarudin, 2022c). Managing the resulting debris is a formidable logistical challenge, as catastrophic events like floods often generate waste volumes that far exceed the capacity of standard municipal services (Luther, 2011). The mobilization of elite units — including the 9th Brigade of the Malaysian Armed Forces, the 18th General Operations Force of the PDRM, and the Special Malaysia Disaster Assistance and Rescue Team alongside the APM — signals a National-Level Crisis Intervention. This reliance on high-level military

and paramilitary assets for the removal of mud and debris suggests that local government infrastructure is fairly under-equipped for large-scale disasters.

The recovery efforts highlight a significant aid network characterized byinter-municipal cooperation and resource sharing. While local governments often face equipment shortages during disasters, the Baling District Office mitigated these gaps by receiving garbage trucks and bulldozers from external local authorities (Malay Mail, 2022). This phenomenon of municipalities assisting other municipalities demonstrates a robust inter-municipal aid system that is essential for large-scale disaster management (Bosseler et al., 2021). Such cooperation often extends beyond local borders, involving public entities from regional and provincial levels to facilitate comprehensive flood disaster management (Sciulli et al., 2015). For instance, the Ipoh City Council (MBI) mobilized a specialized convoy led by its Secretary to assist in cleaning badly affected areas (Mansor, 2022). The strategic use of 4-wheel drive vehicles and MBI lorries facilitated the rapid transport of damaged goods, highlighting the mobilization of external logistics to restore regional order.

The deployment of the Rapid Response Team (PANTAS) Selangor initiative further exemplifies a model of inter-state solidarity and specialized resource mobilization within the Malaysian federal system. To accelerate the recovery process, the Selangor state government deployed 209 personnel and 33 specialized vehicles, including Roll-On-Roll-Off lorries and bulldozers (Azni, 2022). These heavy assets were critical in addressing the primary bottleneck of flood recovery, which is the management of massive debris logistics (Azni, 2022). The PANTAS team focused specifically on clearing fallen trees and reopening blocked roads to ensure displaced victims could return home safely (Md Zain, 2022). Without this ad hoc intervention, prolonged inaction would have likely worsened community suffering and significantly delayed rehabilitation efforts. This integration of specialized tools and multi-state manpower transforms localized recovery into a coordinated national effort.

The collaborative mobilization of academic volunteers and NGOs provides a vital bridge between physical restoration and the psychosocial recovery of flood victims. While many residents returned home daily to clear debris, they remained dependent on PPS at night due to the uninhabitable state of their residences (Kamarudin, 2022d). Research indicates that the removal of flood waste is perceived by survivors as a critical milestone in regaining a sense of normalcy (Ismail et al., 2018). During the Baling floods, missions involving 100 volunteers from Universiti Utara Malaysia and teams from KPT-UiTM Prihatin exemplified this recovery phase by cleaning damaged homes and public facilities with specialized equipment (Universiti Utara Malaysia, 2022; Parzi, 2022). These initiatives demonstrate a synergy where universities provide manpower for technical restoration tasks, such as the physical cleanup of flood-affected houses, while NGOs like the Malaysian Relief Agency manage the logistics of distributing hygiene kits and clothing (Johnson & Hoovler, 2015; Parzi, 2022). Furthermore, some volunteers addressed the emotional toll of the disaster by offering crisis intervention and mental health support (Universiti Utara Malaysia, 2022; Dhaske et al., 2025). However, such heavy reliance on

volunteers may suggest that the formal professional workforce is currently insufficient for national-level crises.

Disaster relief and recovery

The Malaysian Federal Government's immediate response to the Kupang floods demonstrates a high-level political commitment to prioritizing disaster recovery through centralized directives and structured financial aid. By mobilizing the NADMA and appointing a Political Secretary to oversee ground operations, the government ensured that the crisis remained a national priority rather than a localized administrative issue (Sinar Harian, 2022e). Financial provisions, including RM1,000 in Compassionate Aid and RM10,000 for bereaved families, addressed both immediate functional recovery and long-term rehabilitation (Ali, 2022). While these allocations for essential goods and home repairs help restore basic habitability, the "one-size-fits-all" flat rates — in this case RM2,500 for essential goods and RM500 for appliances (Ali, 2022) — may not fully address the diverse needs of households of varying sizes. Furthermore, research suggests that while financial support for disaster victims is also seen in the United States and Japan, heavy reliance on cash injections can foster state dependency among low-income households who lack personal recovery capital (Dari-Mattiacci & Faure, 2015)

Interstate solidarity serves as a vital component of disaster response, facilitating a horizontal support network that complements federal interventions. During the Baling floods, the Terengganu and Kelantan state governments each contributed RM50,000 to Kedah, reflecting a shared commitment to alleviating community hardship (Kamarudin, 2022). By utilizing mechanisms like the Tabung Serambi Mekah fund, these states demonstrated that the Malaysian federal system operates beyond a "top-down" hierarchy, functioning instead as a "Solidarity-Driven Recovery Model." These lateral contributions provide essential "micro" flexibility, allowing for immediate relief that reduces total reliance on central government resources. Ultimately, these partnerships symbolize unity, proving that state-to-state cooperation is necessary for disaster relief (Kamarudin, 2022).

The post-flood disaster demonstrates the essential role of state intervention in protecting the human rights and economic survival of smallholder farmers. The RISDA responded with a well-funded Plantation Recovery Plan, which provided 140 farmers in devastated areas like Kampung Iboi and Kampung Tok Saba with a substantial subsidy of up to RM7,710 per hectare (Zakaraya, 2022c). This structured support, including land rehabilitation and the distribution of seedlings, represents a right to redress, where the state fulfils its duty to restore livelihoods after a catastrophe. However, the destruction of 8.7 hectares of diverse crops, such as rubber, corn, and lemongrass, highlights a persistent lack of flood-resistant infrastructure and protection (Hashim, 2022). As Lipińska (2016) suggests, the state is responsible for establishing national schemes that shield farmers from such production risks. Therefore, while targeted financial aid is a positive step toward recovery, long-term sustainability depends on shifting from reactive disaster relief to proactive protection of the farmers' right to a safe and secure environment.

The economic stabilization of local markets post-disaster depends heavily on targeted financial interventions that facilitate business continuity and long-term resilience. To address the severe disruptions caused by flooding, the KUSKOP launched the Malaysian Family Flood Aid initiative, offering strategic support through agencies such as TEKUN and Amanah Ikhtiar Malaysia (Tahir, 2022). A primary component of this recovery framework was the provision of immediate liquidity via one-time RM3,000 cash grants for informal and micro-entrepreneurs, which provided "fast-acting" capital for those lacking insurance or emergency savings (Tahir, 2022). Additionally, small and medium enterprises were granted access to interest-free loans of up to RM100,000, complemented by a crucial one-year moratorium to allow for profit reinvestment into repairs rather than debt servicing (Tahir, 2022). These measures align with broader post-disaster reconstruction research, which identifies financial and logistical assistance as essential pillars for restoring micro-businesses (Rani, Nifa, Ismail, & Khalid, 2017).

Beyond physical reconstruction, government-backed aid plays a vital role in boosting entrepreneurial morale, encouraging owners to resume operations instead of abandoning their ventures. Research indicates that businesses with access to relief are significantly more likely to reopen, with credit access being the most critical factor for survival (Mohd, Bakar, Hassan, & Hussain, 2017). While some critics argue that a RM3,000 grant may be insufficient to cover extensive stock or equipment losses, the allocation of RM696,000 to aid 232 entrepreneurs demonstrates a commitment to judicious and fair distribution (Zakaraya, 2022d). Such evidence-based interventions are proven to reduce recovery time and enhance the economic resilience of rural small businesses (Lehan & Kamarudin, 2023). Collectively, these initiatives not only help businesses stay afloat but also foster a more resilient entrepreneurial landscape capable of withstanding future climate shocks.

The catastrophic flood at SMA Arab Yayasan Khairiah underscores the urgent necessity of integrating flood risk estimation and resilient design into educational infrastructure. With losses exceeding RM1 million and 50% of key facilities destroyed — including dormitory beds, furniture, and essential textbooks — the event highlights a profound infrastructure vulnerability where physical layouts fail to withstand natural hazards (Zakaraya, 2022e; Abdul Rahman, 2022a). While school authorities successfully prioritized human life by evacuating students to rooftops, the resulting "zero casualties" report sits in stark contrast to the severe academic and material paralysis caused by the fast-rising floodwaters (Abdul Rahman, 2022a). As floods represent one of the three primary hazards to school occupants, this disaster serves as a key driver for policy change, necessitating the use of local flood conditions to set design elevations above the minimum standards (Arnold, 2004). Ultimately, because damage to sanitation, water, and access roads is often repetitive, educational institutions must adopt disaster-resilient plans to safeguard both the continuity of learning and the safety of students (Iqbal & Shahana, 2025)

The restoration of SMA Arab Yayasan Khairiah exemplifies how cross-sector financial coordination is fundamental to the post-disaster recovery of community education infrastructure. Recognizing that functioning schools are vital for societal stability, a unified effort from the public and private sectors was mobilized to facilitate a prompt

reopening (Opabola et al., 2023). Specifically, the private sector provided a rapid financial injection through Al Tamim World Sdn Bhd, which contributed an initial RM100,000 to address immediate financial needs, with a commitment to provide up to RM1 million in stages to ensure sustained recovery (Zakaraya, 2022e). This private aid was bolstered by a royal endorsement from His Majesty the Yang di-Pertuan Agong, whose contribution provided critical moral support and national prestige to the school's plight (Sinar Harian, 2022d). Such public-private synergy demonstrates a holistic "whole-of-society" approach to disaster management, easing the administrative burden on school authorities and ensuring that vital infrastructure is restored without the delays often associated with government budget cycles. Ultimately, this collective support underscores the necessity of community solidarity in safeguarding the continuity of education following catastrophic flood events.

Housing

Recurrent flooding within the Sungai Kupang basin serves as a critical indicator of how geographical vulnerability translates into long-term psychological and economic instability for rural communities. In Kampung Iboi and Kampung Padang Empang, the close proximity of settlements—often just 30 meters from the riverbank—exposed residents to repeated flooding caused by the overflow of Sungai Kupang, leaving households in a state of constant fear (Kamarudin, 2022f, 2022g). While the physical health risks associated with such flooding may eventually recede, the effects on psychological health, including stress and trauma, often persist for years after the event (Tapsell & Tunstall, 2008). These emotional burdens are frequently compounded by significant financial losses; for instance, residents like Siti Hajar Said faced severe economic insecurity due to an inability to tap rubber, while others like Ramlah endured the repetitive destruction of essential household items (Kamarudin, 2022g, 2022h). Furthermore, the societal impact extends to the next generation, as children's education was systematically hindered when families were forced to prioritize immediate home restoration over academic activities (Kamarudin, 2022g). Such multiple forms of disruption emphasize that the impact of floods is not merely material but deeply rooted in the emotional and economic decision-making processes of the affected population (Yeo et al., 2025). Ultimately, the unsustainability of these high-risk zones highlights the urgent necessity for permanent resettlement and proactive flood management policies to restore a sense of security and safeguard community well-being.

Strategic relocation serves as a definitive disaster risk reduction measure by permanently relocating vulnerable populations from disaster-prone regions where traditional infrastructure has reached a total point of failure. In Kampung Padang Empang, the Baling District Office's proactive identification of 19 families living along Sungai Kupang demonstrates a data-driven recognition of the extreme risks posed by headwater surges and rapid flooding (Kamarudin, 2022f). Evidence suggests that current settlements are uninhabitable, as a mere two hours of heavy rainfall is sufficient to flood homes, leaving residents in a state of psychological trauma. Because the uncertainty of future flood severity — driven by climate change — serves as a primary motivation for

households to accept resettlement, the search for a sustainable relocation site is vital for long-term safety (Seebauer & Winkler, 2019). By prioritizing "managed retreat" over temporary fixes, authorities can reduce hazard exposure and mitigate the continuing threat of environmental disasters (Perry & Lindell, 1997). Ultimately, these planned movements offer a critical pathway to community resilience, ensuring that housing is no longer exposed to fast-flowing floodwaters

The strategic relocation of residents from the Sungai Kupang reserve land exemplifies a proactive Disaster Risk Reduction (DRR) strategy necessitated by recurrent flooding and headwater surges. The Baling District and Land Office has initiated rigorous household assessments, a move validated by scientific studies highlighting the extreme vulnerability of these settlements (Abdul Rahman, 2022b; Bernama, 2022). High-level coordination between the Chief Minister and the Land Office ensures a unified crisis management front, while the direct involvement of the Raja Muda of Kedah provides the urgency and accountability required for immediate implementation (Abdul Rahman, 2022b). This approach aligns with the concept of "managed retreat," an essential climate adaptation strategy used to move populations away from high-risk zones (Yarina et al., 2019). Beyond physical safety, permanent relocation serves as a vital coping mechanism; it alleviates the psychological anxiety associated with heavy rainfall and addresses the public's fear of future catastrophic damage (Seebauer & Winkler, 2019).

The relocation of 17 families from Kampung Iboi to Kampung Bok Bak demonstrates how collaborative governance can transform post-disaster recovery into a sustainable resettlement model. By addressing urgent housing needs through a joint federal and state effort, the project highlights the importance of coordinated financial and logistical frameworks in flood-prone regions (Zakaraya, 2024; Rahman, 2024). A key outcome of this initiative is the enhancement of land tenure security; many families transitioned from precarious, informal occupancy on reserve land to legal, gazetted settlements. Additionally, the move provides a significant upgrade in living standards, as families received newly constructed homes designed with sufficient amenities. Ultimately, the Kampung Bok Bak project serves as a critical case study in how inter-governmental collaboration can provide vulnerable communities with both physical safety and long-term socio-economic stability.

The housing project in Keda Kampung Sadek exemplifies a strategic approach to post-disaster resettlement by balancing physical safety with socioeconomic continuity. Launched in August 2022 following the devastating Lata Celak flood, this initiative facilitated the construction of 12 new homes on state-owned land within a low-risk zone (Abdul Rahman, 2022b; Media Baharu, 2023). A defining feature of this project was the preservation of livelihoods; by locating the new site just five kilometers from the original village, the government ensured that residents could continue essential economic activities like rubber tapping without significant disruption (Kamarudin, 2022e). This proximity also minimized social fragmentation, allowing families to maintain established networks and access to local services (Kamarudin, 2022e). The homes were thoughtfully designed with three bedrooms and two bathrooms to provide long-term comfort, culminating in an official handover by the Kedah Chief Minister in June 2023 (National Disaster

Management Agency, 2024; Zakaraya, 2024). This initiative mirrors the objectives of the New Permanent Housing (Rumah Kekal Baharu) projects seen in other regions, which aim to rebuild permanent structures for flood victims through federal and state collaboration (Teo et al., 2021). By prioritizing both immediate security and a range of opportunities for a sustainable future, such projects transition from simple emergency aid to comprehensive community resilience (Teo et al., 2021). Ultimately, the Keda Kampung Sadek project demonstrates that government responsiveness and administrative speed are critical in successfully restoring the dignity and stability of vulnerable populations.

Challenges remain

The government's management of the Kampung Iboi post-flood disaster suggests a lack of alignment between reactive relief efforts and the fundamental protections of life and security mandated by Article 3 of the UDHR. While authorities addressed water shortages following the July 4 flood through emergency deliveries, this measure functioned only as a temporary fix rather than a permanent solution to the underlying infrastructure collapse. Similarly, the environmental response at Gunung Inas appears insufficient to meet urgent safety needs. Despite community demands for immediate reforestation to prevent further mudslides, the state government's decision to rely on a 30-year natural regeneration process leaves residents exposed to ongoing debris floods. By prioritizing slow-acting ecological recovery over immediate hazard mitigation, the state's stance potentially undermines the "security of person" guaranteed under international law. Ultimately, a more proactive approach to environmental restoration and infrastructure repair is essential to fulfil the human rights obligations owed to these vulnerable populations.

Water supply

The July 2022 flood disaster in the Kupang region resulted in severe and prolonged disruptions to the local water supply infrastructure, fundamentally interrupting the daily activities and well-being of the affected population. Approximately 500 residents across 130 homes in Kampung Iboi have grappled with the loss of clean water access since the initial incident on July 4 (Abdul Rahman, 2022c). This crisis was exacerbated by the physical destruction of private assets, as many household wells became filled with sand and debris, leaving residents with few alternatives for sourcing water (Abdul Rahman, 2022c). While there was rapid government intervention through Syarikat Air Darul Aman, which organized periodic water deliveries and provided shared water tanks, these infrastructure supports were often insufficient to meet the total demand (Abdul Rahman, 2022c). Consequently, residents demonstrated significant resilience and community solidarity by sharing limited resources and adapting through rainwater collection (Abdul Rahman, 2022c). However, as noted by Schultz (2024), heavy rains and flood events negatively impact water quality and distribution; this was evidenced in Kampung Iboi where water frequently became murky and unsuitable for cooking or laundry during rainy periods (Abdul Rahman, 2022c). To address these ongoing challenges, local leadership has called

for multi-agency support from NGOs and government agencies to provide storage containers for low-income families, which are essential for establishing a more reliable and sustainable water source in the aftermath of the catastrophe (Abdul Rahman, 2022c).

Gunung Inas deforestation

The large-scale conversion of natural forest landscapes into agricultural plantations has significantly compromised the environmental integrity of the Gunung Inas region, leading to disaster vulnerability for surrounding communities. The deforestation of a 600-hectare area for Musang King durian plantations has led to environmental impacts, making ecological recovery unlikely in the near future (Ikhsan, 2022a). This loss of forest cover has fundamentally weakened soil stability, thereby increasing the risk of landslides, flash floods, and secondary hazards such as debris floods, which introduce dangerous physical objects like rocks and trees into the runoff (Ikhsan, 2022b). Such findings align with broader scientific consensus suggesting that natural forest loss is positively correlated with increased flood frequency (Bradshaw et al, 2007). Specifically, mountain forests and their underlying soils serve a critical preventive role in flood protection by retaining rainwater over large areas during potential runoff events (Markart et al., 2022). According to Prof. Dr. Ahmad Ismail, President of the Malaysian Nature Society (MNS), the absence of this natural infrastructure leaves the area highly susceptible to climate-driven catastrophes (Ikhsan, 2022b). Without immediate restoration and large-scale protection of existing forests, residents will continue to face the persistent threat of mudslides, particularly during the rainy season (Ikhsan, 2022b). Ultimately, the consequences of such forest loss exacerbate the number of flood-related disasters, disproportionately impacting human welfare and inflicting significant economic damage (Bradshaw et al., 2007). Therefore, prioritizing reforestation is a vital imperative to mitigate the severity of future flood-related catastrophes in disadvantaged economies (Bradshaw et al., 2007).

The restoration of Gunung Inas entails a multi-level governance approach that balances ecological recovery with the socio-economic pressures of large-scale agriculture. Following the devastating floods of July 4, local residents have actively demanded government action, specifically calling for the termination of the Musang King durian project in favor of replanting native timber species to restore ecological balance (Abdul Rahman, 2022e). This local advocacy highlights a sharp conflict between public safety and the commercial rush for "premium durian" production, which, in certain cases, has scaled from small orchards to 10,000-acre plantations to satisfy the Chinese market (Khoo, 2024). Clear-cutting for monoculture plantations has historically led to habitat loss, the displacement of indigenous people, and increased flood vulnerability (Khoo, 2024). To mitigate these risks, experts suggest integrating Gunung Inas into the 100 Million Tree Planting Campaign (2021–2025), utilizing a comprehensive ecological strategy that includes ground cover, shrubs, and large native trees (Ikhsan, 2022b). To ensure resource efficiency, existing durian trees could be integrated into this broader reforestation initiative rather than being entirely removed. Furthermore, the state could adopt a harmonization strategy similar to the

National Greening Program in the Philippines, which successfully coordinated government agencies, the private sector, and civil society to achieve sustainable environmental recovery (Cagalanan, 2016). Without such collaborative and immediate action, the region remains susceptible to recurring ecological degradation and intensified disaster risks.

The state government's reliance on passive restoration at Gunung Inas highlights a certain dilemma between the benefits of natural regeneration and the immediate socio-environmental needs of local communities. Chief Minister Datuk Seri Muhammad Sanusi Md Nor maintains that active replanting is unnecessary, arguing that logged areas will naturally recover over a 30-year period, as previously observed in Kedah's forests (Abdul Rahman, 2022d). This stance aligns with findings from Malaysian Borneo, where forests recovering from selective logging between 1981 and 1991 showed significant regeneration after 29 to 39 years of natural growth (Keller et al., 2023). Proponents of this passive approach emphasize its cost-effectiveness, as it eliminates expenditures for saplings and labor while ensuring ecological authenticity through a natural genetic mix of local flora. However, the 30-year timeline for natural recovery presents a severe immediate risk, as the lack of urgent ground cover leaves residents vulnerable to recurring soil erosion and the devastating floods experienced since July 4 (Abdul Rahman, 2022d). While natural processes offer long-term ecological advantages, they do not mitigate the short-term threats to public safety. Thus, the primary challenge for regional policy lies in balancing these slow natural processes with active restoration efforts to ensure both immediate protection and long-term ecological recovery.

Conclusion

In conclusion, the 2022 flood in Kupang, Baling District, Kedah, was a complex disaster resulting from deforestation, geological instability and excessive rainfall. The removal of some trees from Gunung Inas significantly increased the risk of flooding by reducing the land's ability to absorb rainfall. The unstable soil structure further worsened the situation. The flood caused extensive damage to property, disrupted the lives of nearly 1,500 residents, and led to the tragic loss of life. This incident underscores the urgent need for sustainable land use practices, improved flood management, and better disaster preparedness in flood-prone areas. The ongoing risk of flooding in Kupang highlights the need for long-term solutions to mitigate such disasters in the future.

ANNEX A: HUMAN RIGHTS IN DISASTER MANAGEMENT

Human rights are universal and inherent, meaning they must never be neglected or degraded, even during times of crisis (Marwiyah, 2015). Under international law, the protection of individual rights during a disaster is an undisputed duty of the state. Beyond the basic provision of safety, governments bear a fundamental responsibility to ensure that disaster aid is distributed both equitably and adequately to all affected populations. To achieve this, national disaster management strategies should incorporate a formal framework that empowers individuals to assert their rights (Halle, 2018). Such a framework

is essential for maintaining transparency and ensuring that authorities remain accountable for their actions during the response and recovery phases.

The UDHR serves as a fundamental pillar for protecting human rights across all dimensions of society. Established over seven decades ago, it has as its primary objectives upholding human dignity and enhancing the well-being of all individuals, with a specific focus on those in vulnerable conditions. Research suggests that the UDHR is instrumental in shaping global policy and international legal standards (Ouyang & Gruskin, 2010). Furthermore, it provides an essential framework for safeguarding rights during times of crisis. To integrate the UDHR into disaster management, fundamental rights — such as the rights to life, shelter, food, and healthcare — must be protected throughout both the emergency response and long-term recovery phases (Note: The following discussion examines the specific relevance of various UDHR articles within the context of disaster management).

Article 2 of the UDHR mandates that all individuals are entitled to fundamental rights and freedoms without distinction of any kind, including race, color, sex, or social origin (United Nations, n.d.). In the field of disaster management, this article requires that humanitarian aid is distributed fairly, ensuring that no person is excluded based on their individual characteristics. This principle is vital because disasters do not affect all populations equally; rather, they often exacerbate existing societal divides. Research indicates that vulnerable groups — including women, children, the elderly, and people with disabilities — face significantly higher risks and suffer disproportionately during crises. Furthermore, individuals already experiencing socio-economic inequalities often view disasters as an additional layer of hardship that intensifies their struggle for survival (Da Costa & Pospieszna, 2015). Consequently, while governments must prioritize these high-risk groups to prevent extreme suffering, they must remain committed to providing equitable assistance to every affected person.

Article 3 of the UDHR establishes that "everyone has the right to life, liberty and security of person," providing a primary foundation for disaster management frameworks (United Nations, n.d.). This provision is particularly relevant because personal security is frequently compromised during environmental crises (Hesselman, 2013). Beyond physical protection, the principles within Article 3 align with various ethical and religious traditions that prioritize human safety. For example, Islamic teachings emphasize the sanctity of life, reinforcing the universal importance of protecting individuals from harm (Uddin, Osmani, & Jamil, 2023). Consequently, safeguarding the rights to life and security remains a critical priority across all stages of disaster management, including preparedness, emergency response, and long-term recovery (Hesselman, 2013).

The protection of these fundamental rights creates a legal and moral obligation for states to provide immediate assistance to disaster victims. Authorities must act swiftly to ensure that affected individuals receive essential services, such as adequate shelter, food, clean water, and medical care (Marwiyah, 2015). Both national governments and international actors bear the core responsibility of ensuring the safety and well-being of those impacted by a crisis (Da Costa & Pospieszna, 2015). Failure to deliver these basic

necessities places vulnerable populations at extreme risk and constitutes a violation of international human rights standards.

Article 25 of the UDHR guarantees that every individual has the right to a standard of living adequate for their health and well-being, specifically encompassing food, clothing, housing, and medical care (United Nations, n.d.). During events such as floods, these rights are frequently compromised as victims suffer significant damage to their homes and private property (Lapietra & Rizzo, 2020). Such disasters often result in the immediate loss of shelter and restricted access to essential resources like nutrition and potable water. These impacts are felt most acutely by vulnerable populations residing in high-risk, unsafe areas. Furthermore, flooding introduces severe health risks, ranging from direct physical injuries and drowning to indirect consequences such as the spread of communicable diseases and psychological trauma (Hajat & Ebi, 2005).

Social vulnerability factors, including socioeconomic status and governance, heavily influence how a community copes with and recovers from environmental shocks. Communities characterized by lower income levels and limited financial resources often lack the capacity to recover from natural disasters (Lapietra & Rizzo, 2020). To uphold the rights outlined in Article 25, it is imperative for governments to initiate targeted interventions that address these disparities. Strategies such as Community-Based Adaptation can be effective, utilizing structural measures like improved drainage systems alongside non-structural measures like early warning systems and public education. Additionally, fostering social support networks and community-to-community assistance in the aftermath of a disaster is vital for restoring well-being (Obregón, 2024). These combined efforts are essential to reducing economic losses and strengthening long-term community resilience.

Article 22 of the UDHR establishes that every member of society has the right to social security and is entitled to the realization of economic, social, and cultural rights (United Nations, n.d.). This article reinforces the state's responsibility to provide critical support, such as financial assistance, housing, and essential services, to those in need. In the context of flooding, however, the implementation of Article 22 is often inadequate, particularly within fragile states. The realization of these rights is frequently obstructed by complex policy frameworks, legal limitations, and severe resource constraints (Ajtai et al., 2023; Scruggs at al., 2010).

Bureaucratic obstacles and economic limitations significantly delay the recovery process for disaster-affected populations. Administrative hurdles, uncertain funding streams, and frequent changes to recovery plans can lead to prolonged displacement for residents (Khajehei, 2024). Due to these economic pressures, some states may only gradually fulfill their human rights obligations as resources become available (Sepúlveda, 2020). These constraints are most visible during the immediate response phase, where

supply chain disruptions, logistical failures, and staffing shortages hinder the distribution of aid. Ultimately, flood victims experience wide-ranging repercussions at both the household and economic production levels, requiring a robust and uninterrupted social security framework to ensure long-term stability.

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CHAPTER 5

Pathways to Climate Justice: Voices from Farming Communities in Koronadal City, Mindanao, Philippines

Lorena L. Sabino and Fritzielyn Q. Palmiery[15]

Abstract

As the farming communities of Koronadal City's Roxas Mountain Range are already experiencing the intensifying effects of climate change, this chapter of the book examines their lived experience, observations on climate justice and policy aspirations. Qualitative and quantitative data were gathered using focus group discussions (FGDs) and a key informant survey of community representatives and local government leaders. Results indicate that farmers are very aware of climate change and perceive themselves as being disproportionately impacted, particularly in terms of reduced agricultural production and increased vulnerability to climate-related hazards. Participants had complex ideas about climate justice, focusing on fairness in the distribution of resources, empowering vulnerable groups, and having genuine participation in climate-related decisions. 88.89% of the respondents agreed that existing policies enable equity and justice, and 100% had been assured of being consulted within climate programs. Seven bottom-up policy directions that possess the potential to promote climate justice were identified in the research: (1) scaling up support for climate-resilient agriculture; (2) improving disaster risk reduction and adaptation; (3) better access to technical and financial assistance; (4) constructing inclusive and participatory governance; (5) improving land use and resource planning; (6) increasing climate education and awareness; and (7) promotion of renewable energy and sustainable practices. Findings suggest a need for upscaling people-centered, context-specific solutions and support services. This chapter calls for a shift from top-down advice to inclusive and participatory interventions that empower farmers as co-creators of resilience, enabling the development of a transformative climate justice agenda in the Philippines' uplands and beyond.

Keywords: *Climate justice, farming communities, climate change adaptation, participatory governance, LGU planning, climate policy, Philippines, Roxas Mountain Range, sustainable agriculture, equity*

[15] Department of Social Forestry and Forest Governance, College of Forestry and Natural Resources, UPLB

I. Introduction

Climate justice shifts our perspective on how we view climate change, seeing it not only as an environmental or scientific issue but also as a moral and justice issue. It illustrates how the effects of climate change are not evenly distributed and often exacerbate existing inequalities, marginalization and the oppression of vulnerable communities. At the same time, wealthier countries and privileged groups that contribute the most to greenhouse gas emissions are less vulnerable (Sultana, 2022; Resnik, 2022; Porter et al., 2020; Moellendorf, 2021; Sengupta, 2023).

This perspective calls for equitable and inclusive climate solutions that transcend technical fixes. It urges attention to the social, political, economic and ethical dimensions of climate change, including human rights, accountability and the right to sustainable development (Moellendorf, 2021; Sultana, 2022; Zimm et al., 2024; Mikulewicz et al., 2023). Successful climate policy must be grounded in a sense of fairness and justice, and it cannot perpetuate existing inequalities (Resnik, 2022; Holland, 2017; Godden et al., 2022). Intersectional policies are necessary to address the simultaneous forms of marginalization, i.e., gender, class and ethnicity (Mikulewicz et al., 2023; Godden et al., 2022).

Despite growing international focus, climate justice remains unevenly applied within both global and local policy structures. Most of the measures remain inadequate to address the needs of the marginalized groups or to include their active participation (Sengupta, 2023; Kaklauskaite & Streimikiene, 2024). At its essence, climate justice is rooted in the redistribution of power and resources, collective action and the reorientation of systemic structures that perpetuate environmental and social injustice (Zimm et al., 2024; Moellendorf, 2021; Holland, 2017; Porter et al., 2020). Climate justice has therefore become a crucial paradigm for understanding and addressing the unequal impacts of climate change, particularly among vulnerable populations.

The Philippines is consistently ranked as one of the world's most disaster-prone nations. It is the second most disaster-prone nation to climatic hazards, as per the Germanwatch Global Climate Risk Index 2020. Since it lies on the Pacific Ring of Fire and the typhoon belt, it receives around 20 tropical cyclones every year. Eight to nine of them typically make landfall and cause a tremendous amount of destruction (Santos, 2021; Yumul et al., 2011). Climate change has led to disasters occurring more frequently and causing even greater damage. For instance, floods, landslides, droughts and infrastructure destruction have occurred (Hong et al., 2022; Bayani et al., 2023; Laureta et al., 2021).

The effects of climate change hit the rural agricultural economy the hardest. Farmers face increasing vulnerability to natural disasters, coupled with socio-economic adversity, limited coping capacity and soil degradation, including deforestation and biodiversity loss. Even urban cities like Metro Manila are not exempt from these effects, with increasing urbanization and inadequate infrastructure contributing to heatwaves and urban flooding (Bagtasa, 2019).

Variability also occurs at the regional level. River basins are more vulnerable, leading to extreme floods, typhoons and drought, which threaten urban planning and rural livelihoods (Bharambe et al., 2023; Laureta et al., 2021). Future projections indicate that heavy rainfall events will intensify by 2100 under high-emission conditions, underscoring the need for urgent adaptation, risk reduction and equitable policy action (Hong et al., 2022).

Koronadal City, a town in South Cotabato, is a prime example of the additional hazards associated with living in agricultural areas. In 2016, a state of calamity was declared due to a prolonged drought, which made it difficult to obtain food and make a living (Sabino et al., 2020). The area is one of the Philippines' "food basket" regions. Koronadal City is situated at the base of the Roxas Mountain Range, a major watershed that provides the local population with water, agricultural products and non-forest timber. Most people who live in these areas work in agriculture; therefore, they are susceptible to changes in the weather and environmental stress (Sabino et al., 2021).

In this context, addressing climate change requires a justice lens that centers on equity, participatory processes and community-led adaptation. Barangay Assumption in Koronadal City provides a compelling case. See et al. (2024) note that the community's adoption of inclusive, epistemologically diverse and restorative justice methods demonstrates the power of local knowledge and grassroots action. Their strategies incorporate marginalized voices, foster collective participation, and prioritize ecosystem restoration, demonstrating how climate justice can be both transformative and grounded in everyday realities.

Nonetheless, challenges persist. Power asymmetries and local political dynamics can undermine or co-opt well-intentioned initiatives, risking the reinforcement of existing inequities if not carefully addressed (See & Wilmsen, 2022). These realities stress the importance of combining top-down policy frameworks with bottom-up, culturally responsive initiatives.

This book chapter will position climate justice within the lives of vulnerable farming communities in the Philippines, using the Roxas Mountain Range as a case study. This book presents a compelling case study on how a farming community responds to, copes with, and adapts to achieve climate justice. It specifically intends to:

1. examine climate change impacts experienced by farming communities in the Roxas Mountain Range, Koronadal, Mindanao, Philippines;
2. examine the core principles of climate justice and evaluate how these are applied in the study area; and,
3. determine the existing policies, governance structures and local adaptation and strategies on advancing climate justice in the study area.

II. Methodology

Research Design

The study focused on barangays within the Roxas Mountain Range, Koronadal City, Mindanao, Philippines, which were selected due to their geographic vulnerability to climate-induced hazards, such as landslides, drought and typhoons, as well as their socio-economic dependence on agriculture (Sabino et al., 2021).

The research conducted FGDs with nine (9) respondents altogether: six (6) local leaders from barangays (Saravia, Carpenter Hill, Mambucal and San Isidro) within the Roxas Mountain Range, and three (3) from the local government unit (LGU) of Koronadal City. The same nine (9) respondents also completed a structured survey form to provide quantitative data to supplement the qualitative findings. Respondents included personnel from the City Environment and Natural Resources Office, the City Agriculture Office, and representatives from barangay local government units, particularly those serving on committees for Agriculture, Environment and Disaster Risk Reduction and Management. The questionnaire enriched the analysis by offering a quantitative perspective on local awareness of climate change and climate justice, as well as perceptions of the effectiveness of existing interventions.

Additionally, a comprehensive literature review was also conducted on climate justice, climate change impacts, adaptation strategies and community responses in similar upland and agricultural settings.

The World Cafe technique used in the FGDs was utilized for its participatory ethos, which aligns with the deliberative democratic principles in the context of climate governance. The World Cafe is a participatory and engagement method that encourages collaborative dialogue through small-group discussions focused on key thematic questions. Participants will rotate among stations or tables, each facilitated by a moderator, where they will discuss a set of related questions. Notes will be recorded to capture insights, and participants may build on each other's responses as they rotate to the following table. Discussions were conducted in local languages (Filipino, Hiligaynon, or Cebuano, as appropriate) and were recorded, transcribed and translated for analysis. This work emphasizes the need for inclusive platforms where local actors co-create solutions.

The FGD guide focused on four (4) thematic areas:

Theme 1: Climate Policies and Initiatives – exploring awareness, experiences and the effectiveness of programs. This theme examined the local knowledge and lived experiences related to climate policies and programs in Koronadal City, particularly in the farming communities of the Roxas Mountain Range.

Key questions:

1. What climate policies, programs, or initiatives are being implemented in Koronadal City, particularly for farming communities in the Roxas Mountain Range?

- Can you share specific examples and their impact on your livelihoods?
- What specific programs do you think are most effective, and what improvements would you recommend?

2. What are the biggest challenges in implementing climate change adaptation and mitigation strategies for farming communities, and how have these impacted their livelihoods?
3. How do local government units, NGOs and other stakeholders collaborate in addressing climate change in farming communities? Are these partnerships effective?

Theme 2: Principles of Climate Justice – examining fairness, equity, inclusion and rights. This theme focused on perceptions and the application of fairness, equity and inclusion in climate change programs. It aims to assess how climate justice is understood and experienced at the community level.

Key questions

1. What do fairness, equity and inclusion mean to you in the context of climate change programs? Do you feel these principles are applied in your community?
2. How do you feel resources and benefits from climate programs are distributed in your community? Are they fair and equitable?

Theme 3: Participation and Inclusion – assessing community engagement in decision-making. This theme examines the degree to which farming communities are engaged in the planning, decision-making and implementation of climate-related initiatives. It also assesses the inclusion of marginalized groups.

Key questions

1. How do you perceive the involvement of farming communities in climate change initiatives?
2. Has your community participated in the planning or decision-making of climate change programs?
   - If yes, in what ways?
   - If no, what factors have prevented participation?
3. What challenges do you encounter when participating in climate-related programs or initiatives?
   - How can these challenges be addressed?
   - Are there specific groups within your community that are often excluded?
   - How are farming communities engaged in decision-making processes related to climate change adaptation and mitigation? Do they have a meaningful role?
   - How are vulnerable groups—such as women, Indigenous peoples and youth,

recognized and included in climate-related initiatives for farming communities?

Theme 4: Developing Strategies for Climate Justice – identifying challenges, solutions and opportunities for collaborative governance. This theme seeks forward-looking strategies to enhance climate justice and sustainability. It focuses on identifying locally relevant solutions and collaboration opportunities.

Key questions:

1. What do you think are the most pressing climate-related challenges faced by farming communities in the Roxas Mountain Range? How do these challenges intersect with issues of equity and fairness?
2. What targeted strategies or solutions do you suggest are better to address the needs and vulnerabilities of farming communities while ensuring climate justice and sustainability?
3. What role should education, capacity-building and awareness programs play in promoting sustainable and equitable climate adaptation practices?
4. Based on your experience, what opportunities exist to improve stakeholder collaboration and ensure climate justice for farming communities in Koronadal City?

Data Analysis

Qualitative data from FGDs were subjected to manual thematic and descriptive analysis, with emerging themes aligned to the core principles of climate justice and the research objectives. Responses were categorized and synthesized to identify community-driven insights and context-specific strategies.

Quantitative data from the key informant survey were analyzed using descriptive statistics (e.g., frequency counts and percentages) to illustrate patterns of awareness, perceptions and recommendations.

Ethical Considerations

Informed consent was obtained from all participants prior to data collection. Participants were assured of the confidentiality and voluntary nature of their participation.

III. Literature Review

Concepts and Theoretical Foundations of Climate Justice

Climate justice is defined as a moral and justice issue, emphasizing that climate change is not merely a scientific or technical problem, but one that involves deep ethical considerations about how climate impacts are distributed and addressed (Sultana, 2022). This perspective marks a shift from mainstream climate debates, which have historically focused on emissions and technical solutions, toward approaches that center on justice, equity and the lived experiences of those most affected by climate change (Sultana, 2022; Schlosberg & Collins, 2014).

Historical Development of Climate Justice

The historical development of climate justice is deeply rooted in the environmental justice movement, which began gaining prominence in the United States during the early 1980s, notably with the 1982 protests in Warren County, North Carolina, where African-American communities, civil rights activists and environmentalists united against toxic waste dumping (Schlosberg & Collins, 2014). However, environmental justice concerns date back even further, for example to the 1971 activism in Michigan, and have always intersected with labor, urban reform, civil rights, occupational health and Indigenous land rights movements (Faber & McCarthy, 2003; Schlosberg & Collins, 2014; Pellow, 2021).

The term "climate justice" was first used by Weiss in 1989, as activists recognized that climate change would exacerbate existing social and environmental inequalities. As scientific understanding of climate change grew in the 1990s, the movement expanded globally, with the 1997 Kyoto Protocol marking an initial, though limited, international response that did not fully address the unequal burdens faced by marginalized communities (Schlosberg & Collins, 2014; Lefstad & Paavola, 2023). The establishment of the Environmental Justice and Climate Change Initiative in 2001 and the devastating impact of Hurricane Katrina in 2005, where low-income and minority communities suffered the most, further solidified the link between environmental and climate justice, highlighting the need to address the "climate gap" between rich and vulnerable populations (Schlosberg, 2012; Schlosberg & Collins, 2014; Levy & Patz, 2015; Pellow, 2021). Post-Katrina, activists increasingly focused on the disproportionate impacts of emissions and climate disasters on marginalized groups, pushing for the equitable distribution of both climate change burdens and mitigation efforts (Schlosberg & Collins, 2014; Islam, 2024).

The Paris Agreement in 2015 marked a significant turning point by explicitly incorporating equity into global climate policy, urging all nations to reduce emissions while considering differentiated responsibilities and capacities (Lefstad & Paavola, 2023; Schlosberg & Collins, 2014). Today, climate justice is recognized as a critical, intersectional movement that seeks to address both historical and ongoing injustices by centering the voices and needs of the most affected communities in climate action and policy (Schlosberg & Collins, 2014; Islam, 2024; Pellow, 2021; Baptista et al., 2022).

Core Concepts of Climate Justice

Core concepts of climate justice are anchored in the principles of equity, fairness, participation, inclusion, rights and responsibilities, reflecting a commitment to redressing both historical and ongoing injustices (Sultana, 2022; Will & Manger-Nestler, 2021; Coggins et al., 2021; Schrock et al., 2015). Equity and fairness require that those most responsible for climate change, primarily wealthier nations and major polluters, should bear a greater share of the burden in addressing its impacts, while prioritizing support for the most vulnerable populations (Sultana, 2022; Will & Manger-Nestler, 2021; Coggins et al., 2021). Participation and inclusion are essential, ensuring that marginalized groups such as women, youth and Indigenous peoples have meaningful roles in climate-related decision-making

and that their diverse perspectives are integrated into policy (Sultana, 2022; Coggins et al., 2021; Fitzgerald, 2022).

The literature identifies four (4) key dimensions of justice: distributive justice (fair allocation of resources and burdens), procedural justice (fairness in decision-making processes), recognition justice (acknowledging diverse identities and experiences), and capability justice (ensuring people have the means to adapt and thrive) (Coggins et al., 2021; Walker et al., 2024; Saraswat & Kumar, 2016; Mattar et al., 2021). Addressing marginalization, exploitation and systemic inequalities is fundamental, as climate justice seeks to dismantle barriers and promote transparency, ensuring that climate solutions are inclusive, participatory and just for all (Sultana, 2022; Coggins et al., 2021; Mattar et al., 2021; Schrock et al., 2015). These principles are operationalized through international agreements such as the Paris Agreement, which incorporates equity and differentiated responsibilities, as well as through local and organizational efforts to ensure justice, accessibility and meaningful participation in climate action (Will & Manger-Nestler, 2021; Fitzgerald, 2022).

Ultimately, climate justice upholds fundamental rights, including the right to life, health, development and a safe environment, and holds major polluters and governments accountable for reducing emissions and investing in equitable solutions (Sultana, 2022; Will & Manger-Nestler, 2021; Coggins et al., 2021; Schrock et al., 2015).

Theoretical Foundations

The theoretical foundations of climate justice are rooted in the recognition that climate change is not merely an environmental or technical problem, but a deeply social, ethical and power-laden issue (Zimm et al., 2024; Malloy & Ashcraft, 2020; Islam, 2024). Drawing on environmental justice, global justice and critical social theory, climate justice emphasizes how climate impacts and responsibilities are distributed unevenly along lines of race, gender, class and geography (Amorim-Maia et al., 2022; Zimm et al., 2024; Mikulewicz et al., 2023). Foundational frameworks encompass distributive justice (the equitable allocation of burdens and benefits), procedural justice (inclusive and fair decision-making processes), and recognition justice (valuing diverse identities and knowledge systems) (Zimm et al., 2024; Malloy & Ashcraft, 2020; Walker et al., 2024).

Intersectionality is increasingly central, emphasizing the need to address overlapping and compounding vulnerabilities among historically marginalized groups and to tackle the root causes of systemic injustice through place-based, participatory and care-centered strategies (Amorim-Maia et al., 2022; Mikulewicz et al., 2023). Theories of climate justice also debate the roles of individual versus collective and political responsibility, with many scholars arguing that structural transformation and collective action are essential to address the root causes of climate injustice (Sardo, 2020; Islam, 2024). Non-ideal theories focus on practical pathways for achieving justice, acknowledging the complexities and imperfections of real-world political processes (Sardo, 2020). Recent perspectives expand the scope of justice to include more-than-human worlds, recognizing the interconnectedness of ecological and social systems (Islam, 2024).

Philosophical frameworks such as utilitarianism and egalitarianism further inform debates about whether to maximize overall well-being or prioritize the most disadvantaged (Zimm et al., 2024; Malloy & Ashcraft, 2020). Additionally, intergenerational justice frameworks emphasize the importance of fairness between current and future generations, thereby ensuring sustainability and well-being over time (Cisco & Gatto, 2020). Pluralism in defining and measuring justice is also emphasized, as different contexts require tailored approaches and conceptual clarity for effective policy and practice (Walker et al., 2024; Biermann & Kalfagianni, 2020). These theoretical frameworks guide both research and policy toward more equitable, inclusive and transformative climate action (Amorim-Maia et al., 2022; Zimm et al., 2024; Malloy & Ashcraft, 2020; Islam, 2024).

Climate justice and social equity

Climate justice and social equity are deeply interconnected, as climate justice reframes climate change from a purely scientific or technical issue to one of moral and social concern, emphasizing how climate impacts are experienced unevenly and disproportionately by marginalized groups (Sultana, 2022; Amorim-Maia et al., 2022). This approach aims to reduce marginalization, exploitation and oppression while promoting equity and justice in climate action (Sultana, 2022).

Intersectional climate justice frameworks emphasize the importance of addressing overlapping vulnerabilities, such as those based on race, gender and class, by addressing the root causes of social and environmental injustices and promoting inclusive, place-based strategies (Amorim-Maia et al., 2022). Equity in climate policy involves not only the fair distribution of resources and risks but also ensuring that affected communities have a meaningful voice in decision-making and benefit from adaptation and mitigation efforts (Walker et al., 2024; Coggins et al., 2021).

Empirical research suggests that distributive and procedural justice are often prioritized; however, recognition and capability approaches are also crucial for achieving holistic and practical climate adaptation (Coggins et al., 2021). Urban climate planning, for example, must avoid reinforcing existing inequalities through exclusion, green gentrification, or neoliberal policies, and instead prioritize justice-driven, community-led solutions (Pratt, 2023; Foster et al., 2024). Ultimately, advancing climate justice requires explicit attention to social equity at every stage of climate policy and practice, ensuring that the most vulnerable are not left behind as the world responds to climate change (Sultana, 2022; Amorim-Maia et al., 2022; Foster et al., 2024; Walker et al., 2024).

Climate justice policy frameworks

Climate justice policy frameworks are designed to ensure that climate action addresses social inequities and centers the needs of vulnerable and marginalized groups. Effective frameworks emphasize the inclusion of socially vulnerable populations as active participants in decision-making, the explicit recognition of systemic injustices, and on-

going evaluation to ensure that policies remain just over time (Malloy & Ashcraft, 2020; Schlosberg, 2012).

Many frameworks integrate multiple dimensions of justice, including distributive, procedural, recognition, relational and restorative justice, to assess and guide policy development. This is evident in tools developed for Indigenous and decolonial contexts, which call for transformative change beyond existing political systems (Jones et al., 2024). Polycentric governance models, which involve multiple overlapping authorities and actors, are highlighted for their flexibility and ability to incorporate procedural justice norms, making them well-suited to address the complexity and uncertainty of climate governance (De Ridder et al., 2023).

Capabilities-based approaches focus on enhancing the basic needs and agency of individuals and communities, ensuring that adaptation policies address both vulnerability and participation (Schlosberg, 2012). Internationally, legal and policy frameworks vary, but best practices include transparent decision-making, equitable resource distribution and mechanisms for addressing loss, damage and historical injustices (Nigam & Parikh, 2023; Onifade, 2021). Recent advances also incorporate multi-objective and multi-agent approaches to balance climate, economic and equity goals in policy design (Biswas et al., 2025; Zimm et al., 2024). Climate justice policy frameworks aim to institutionalize equity, participation and transformative change at all levels of governance (Malloy & Ashcraft, 2020; Jones et al., 2024; De Ridder et al., 2023; Schlosberg, 2012; Nigam & Parikh, 2023).

Frameworks for Implementation

Conceptual models for a just adaptation emphasize the need for inclusive participation, explicit recognition of systemic injustice and ongoing evaluation of adaptation policies to ensure that they advance justice (Malloy & Ashcraft, 2020). Empirical research highlights the importance of operationalizing justice in climate adaptation, using frameworks that assess distributive, procedural, recognition and capability justice in real-world contexts (Coggins et al., 2021; Walker et al., 2024). However, there is a call for more holistic, multiscale and pluralistic approaches to capture the diverse realities of climate adaptation and justice (Coggins et al., 2021; Walker et al., 2024).

The literature emphasizes the necessity of holistic, multidimensional and transformative approaches to climate justice that address both environmental and social inequities (Sultana, 2022; Kaklauskaite & Streimikiene, 2024; Islam, 2024). Future research should prioritize inclusive, participatory frameworks and develop new metrics and methodologies to better assess and implement justice in climate policy and practice (Amorim-Maia et al., 2022; Zimm et al., 2024; Coggins et al., 2021).

Local Governance and Climate Policy Landscape

The climate policy landscape in the Philippines is characterized by a comprehensive legal and institutional framework, including the Climate Change Act of 2009 (Republic

Act (RA) 9729), as amended by RA 10174, which established the People's Survival Fund, the National Climate Change Action Plan (NCCAP) 2011-2028, the Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121), and the Local Government Code of 1991 (RA 7160) (Cruz & Angeles, 2022; Balderama, 2022; La Viña & Reyes, 2021). These frameworks devolve significant responsibilities to LGUs, mandating the development of Local Climate Change Action Plans (LCCAPs) and the integration of climate adaptation and disaster risk reduction into local planning processes (Balderama, 2022; Cruz & Angeles, 2022; Cuevas, 2021).

In practice, LGUs like those in Koronadal City have implemented activities such as tree planting, environmental ordinances and livelihood programs targeting youth and women, reflecting efforts to mainstream climate action at the grassroots level (Gabriel et al., 2021; Balderama, 2022). However, persistent challenges hinder effective implementation, including institutional fragmentation, overlapping mandates, insufficient funding for disaster risk reduction and management (DRRM) officers, and limited human resources (Cuevas, 2021; Gabriel et al., 2021; Cruz & Angeles, 2022). Studies highlight that while national policies are robust, their translation into local action is often hampered by slow policy transmission, lack of prioritization and limited local capacity (Sulistiawati & Rembeth, 2025; Gabriel et al., 2021).

The effectiveness of local climate governance is further shaped by the degree of community engagement, the integration of climate considerations into broader development plans, and the presence of enabling institutional mechanisms (Tendero & Moreno, 2023; Cuevas, 2021). International partners, such as the European Union, have provided technical and financial support, but LGUs still face significant barriers in mobilizing resources and sustaining climate initiatives (Roldan, 2022; Cruz & Angeles, 2022). While the Philippines has established a strong policy foundation for climate governance, addressing institutional and resource gaps at the local level remains critical for achieving resilient and inclusive climate action (Gabriel et al., 2021; Cruz & Angeles, 2022; Cuevas, 2021).

IV. Results and Discussion

Climate justice is fundamental in the Philippines because the nation is highly vulnerable to climate risks and heavily impacted by the effects of climate change on vulnerable communities. Climate justice encompasses not only mitigating environmental risks but also ensuring equitable treatment, access and recognition for all who are affected, especially those who have been historically marginalized.

1. Local Context: Climate change perception, observation and impacts in the Roxas Mountain Range

The Roxas Mountain Range in Koronadal City is an important agricultural and ecological belt, where farm households are heavily dependent on natural resources. The land was once rich and fertile, producing a wide range of agricultural products. Climate-related

problems, such as drought, flooding and landslides, now pose a significant threat to the land, jeopardizing environmental health, agricultural productivity and human well-being.

Existing scientific evidence (Sabino et al., 2021) reveals an increase in mean temperatures and highly uncertain rainfall trends. The climatic shift has manifested itself in real, adverse effects, including reduced yields in agricultural produce, increased soil erosion, loss of cultivable land and changes in livelihoods.

Sabino et al. (2021) also highlighted the following dominant climatic trends:

- Temperature Changes: From 1981 to 2012, the average minimum temperature rose by 0.74°C and the average maximum temperature fell by 0.65°C, leading to an overall rise in monthly mean temperatures.
- Rainfall Changes: Drastic changes in the levels of rainfall, especially in June, August and December, indicate more insecure and extreme climatic conditions.

Sabino et al. (2021) report that the changes in temperature and rainfall patterns indicate that climate change is already dominant in Koronadal City, providing evidence that the community is becoming increasingly susceptible to climate variability and extremes.

Familiarity with climate change

Findings from the key informant survey revealed that all respondents (n = 9) had some degree of familiarity with climate change, with most exhibiting very high awareness **(Table 1).**

Table 1. Familiarity with climate change (n = 9)

Level of Familiarity	Number of Respondents (n = 9)	Percentage (%)
Not at all familiar	0	0%
Not very familiar	0	0%
Somewhat familiar	3	33%
Very familiar	6	67%

Table 1 indicates that

- Six (6) respondents (67%) reported being very familiar with climate change.
- Three (3) respondents (33%) reported being somewhat familiar.
- No respondent reported being not very familiar or not familiar.

This reflects a high level of general awareness of climate change by the respondents. Their familiarity would most probably be due to exposure to climate information through formal education, community activities, direct experience, or the media.

Such familiarity is important, for it is usually associated with:

- greater concern over environmental effects;
- better preparedness to take part in mitigation and adaptation measures; and
- higher level of informed decision-making on the individual, community and institutional level.

The fact that no respondents fell into the "Not very familiar" or "Not at all familiar" categories further indicates that people are now aware of and presumably concerned about climate change in their daily lives, perhaps as a result of firsthand experiences with climate-related disasters, such as floods, droughts, or extreme temperatures.

Frequency of Exposure to Climate Change Information

When respondents were asked about the frequency of exposure to climate change information **(Table 2**), the responses revealed a high level of exposure.

Table 2. Frequency of Exposure to Climate Change Information (n = 9)

Level of Exposure	Number of Respondents	Percentage (%)
Never	0	0%
Rarely	0	0%
Sometimes	4	44%
Very Often	5	56%

As shown in Table 2, all nine (9) respondents reported a significant level of exposure to climate change information, news, or discourse:

- Five (5) out of nine (9) (56%) respondents indicated having come across climate change information very frequently.
- Four (4) out of nine (9) (44%) respondents indicated having come across such information from time to time.
- Interestingly, no respondent chose "never" or "rarely", indicating that all the respondents have frequent exposure to climate change information.

This climate information is attributed to widespread media coverage, radio advertisements, government or information campaigns, and the incorporation of climate concerns in the workplace (most notably, among respondents who are workers in LGUs and environmental offices), as well as direct personal and community exposure to climate events.

Climate-related Hazards and Impacts

Table 3 lists the most common climate-related hazards mentioned by respondents as affecting the Roxas Mountain Range. Landslides emerged as the most often named hazard, with eight (8) out of nine (9) respondents (89%) naming it. Flooding and drought followed closely, with seven (7) respondents (78%) naming each as having often affected the environment and livelihoods in the area.

Table 3. Climate-Related Challenges Affecting the Roxas Mountain Range (n = 9)

Climate Hazards	Number of Respondents	Percentage (%)
Drought	7	78%
Flooding	7	78%
Typhoons	0	0%
Landslides	8	89%

Interestingly, none of the respondents listed typhoons among their primary concerns related to climate change. This may suggest that heavy rainfall directly caused floods and landslides. Farming communities in the Roxas Mountain range are also vulnerable to intense heat and drought. The high frequency of landslides, floods and droughts correlates with the topography and climatic conditions of the area. Such hazards are likely to pose threats to various forms of infrastructure, substantially reduce agricultural productivity, and increase vulnerability among mountain peoples.

Climate hazards are exacerbated by inadequate climate-resilient infrastructure, poor land use planning and limited support for farming communities. The findings emphasized the significance of adaptive practices to slope stabilization, water management and disaster risk reduction at the community level throughout the Roxas Mountain Range.

Key informant respondents also shared their observations on the effects of climate hazards on the environment and agriculture, based on nine (9) key informant inputs.

- Four (4) respondents (44%) chose crop diseases as a significant effect of climate hazards. This indicates growing concern among local stakeholders about the impact of unstable weather patterns, such as excessive rainfall or prolonged drought, on the prevalence of pest infestations and plant diseases, thereby undermining food production.
- Three (3) respondents (33%) mentioned biodiversity loss, which indicates the environmental imbalance caused by climate-related disturbances. Flash floods, droughts and landslides may be altering natural conditions, leading to the degradation of plant and animal populations within the Roxas Mountain Range.
- Soil erosion, as reported by two (2) respondents (22%), while not as frequently cited, still poses a concern. Excessive rainfall and droughts, which are climate stressors, may potentially cause erosion, nutrient loss and lower land productivity, which would consequently affect the long-term sustainability of farms.

Table 4 presents respondents' perceptions of the seriousness of climate change's impact on their community's farming livelihood. A significant majority, seven (7) out of nine (9) respondents (78%), view the impact as extremely serious, while the remaining two (2) respondents (22%) consider it somewhat serious. Notably, no one reported the impact as "not very serious" or "not serious at all."

This strong consensus highlights the alarming impact of climate change on agriculture, which is the primary source of livelihood for the communities in the Roxas Mountain Range. The responses underscore widespread experience of reduced crop yields, increased pest and disease outbreaks, unreliable weather patterns and climate-induced disasters, such as droughts, floods and landslides, all of which contribute to livelihood insecurity.

Table 4. Perceived Seriousness of Climate Change's Impact on Farming Livelihoods (n = 9)

Level of Seriousness	Number of Respondents	Percentage (%)
Extremely serious	7	78%
Somewhat serious	2	22%
Not very serious	0	0%
Not serious at all	0	0%

The findings signal an urgent need for targeted climate adaptation strategies in the agricultural sector, including climate-resilient farming techniques, crop diversification and support mechanisms for vulnerable farming households.

To assess perceptions of climate justice and equity, respondents were asked whether they believe that farming communities in the Roxas Mountain Range are disproportionately affected by climate change. The responses are summarized in **Table 5** below.

Table 5. Perceptions on Disproportionate Impact of Climate Change on Farming Communities (n = 9)

Response	Number of Respondents	Percentage (%)
Strongly agree	3	33%
Agree	5	56%
Disagree	1	11%
Strongly disagree	0	0%

As shown in Table 5, a combined eight (8) out of nine (9) respondents (89%) either agreed or strongly agreed that farming communities in the Roxas Mountain Range bear a disproportionate burden from the impacts of climate change. Only one (1) respondent (11%) disagreed, and none strongly disagreed.

These results suggest a strong consensus that farming populations, often reliant on natural resources and sensitive to weather variability, are more vulnerable than other groups. The perceived disproportionate impact may be related to recurrent exposure to extreme climate events, such as landslides, droughts and flooding, as well as limited access to support systems or adaptive technologies.

This perception aligns with broader concepts of climate justice, where already marginalized or economically dependent communities experience greater risks and fewer resources to cope with climate change. The findings support the call for equitable climate action, prioritizing resource allocation, capacity building and policy attention to vulnerable rural and agricultural communities.

2. Understanding Climate Justice from the Perspective of Farming Communities in the Roxas Mountain Range

Fairness, equity, inclusion and participation are increasingly recognized as core principles of climate justice, shaping how societies respond to climate change impacts and design adaptation strategies. These principles ensure that climate actions do not perpetuate existing inequalities and that all voices, particularly those of marginalized groups, are taken into account in decision-making.

Fairness in climate justice often refers to the just distribution of climate burdens and benefits, taking into account historical responsibility and current capabilities. Principles such as "polluter pays," "ability to pay," and "equal per capita rights" are commonly debated in climate policy to address who should bear the costs of mitigation and adaptation (Davidson, 2021; Shue, 1999; Grasso, 2007; Mandard, 2024; Okereke, 2010). Rights are about upholding the right to a safe environment, sustainable livelihood and protection from harm.

Equity is conceptualized in multiple ways: distributive (fair allocation of resources), procedural (fairness in decision-making), recognition (acknowledging diverse identities and needs), and intergenerational (fairness to future generations) (Walker et al., 2024; Coggins et al., 2021; Petesch et al., 2024; Puaschunder, 2020; Puaschunder, 2021; Grasso, 2007; Swingle, 2019). Additionally, climate justice focuses on the equitable distribution of climate risks and benefits, meaningful participation in decision-making processes, and the protection of rights for all, particularly marginalized groups (Sultana, 2022; Mohtat & Khirfan, 2021; Shi et al., 2016). Equity is about addressing the uneven vulnerabilities and adaptive capacities among households.

Inclusion emphasizes the participation in climate policy and adaptation planning of all affected groups, particularly those historically marginalized. Inclusive processes are essential for procedural justice and for ensuring that solutions are contextually relevant and widely accepted (Le, 2020; Petesch et al., 2024; Vickery & Quinn, 2024; Yazar et al., 2024; Cairney et al., 2023). Participation ensures that local voices, knowledge and experiences guide planning and implementation.

Participation is often framed as a collective pursuit, involving diverse groups (youth, elders, marginalized communities) working together for systemic change, not just individual behavior shifts (Trott et al., 2023; Hilder & Collin, 2022). Participation in the context of climate justice refers to the meaningful involvement of individuals and communities, especially those most affected by climate change, in decision-making, advocacy and action related to climate policies and solutions. It goes beyond token consultation, emphasizing collective, inclusive and empowered engagement that shapes outcomes and addresses systemic injustices.

In the Roxas Mountain Range, these climate justice principles are particularly relevant as farming households face disproportionate exposure to climate hazards, including floods, landslides and droughts. Participant responses from the FGDs revealed nuanced perspectives on how these principles are understood, experienced, and applied, or not, in local climate change programs.

2.1 Community Perspectives on Climate Justice in the Context of Climate Change

Application of Climate Justice Principles

Climate change is not only an environmental issue but also a matter of social justice. As its impacts disproportionately affect vulnerable communities, such as smallholder farmers, Indigenous peoples and low-income households, there is a growing need to ensure that the principles of equity and fairness guide climate policies. To understand stakeholder perspectives on this, the study asked: *"**Do you believe that climate change policies consider the principles of equity and fairness**?"* The responses offer insight into how inclusive and just current climate policy frameworks are perceived by key community actors.

The results of this question reveal that most respondents (8 out of 9, or 88.89%) believe that current climate change policies incorporate the principles of equity and fairness. This indicates a strong perception among stakeholders that the formulation and implementation of climate policies in their context consider issues of justice, inclusivity and the fair distribution of benefits and burdens.

Only one (1) respondent (11.11%) expressed uncertainty, while none explicitly disagreed. This suggests that, although there is a generally positive outlook, a small degree of ambiguity or lack of clarity remains for some regarding the extent to which these principles are embedded in practice or policy outcomes.

Community Definition of Climate Justice

Climate justice based on principles

To gauge how respondents conceptualize climate justice based on principle-based frameworks, they were asked to select the definition that resonates most with their un-

derstanding. As shown in **Table 6**, three (3) core principles were presented, reflecting dominant themes in climate justice discourse.

Table 6. Principle-Based Definitions of Climate Justice Based on Principles (n = 9)

Note: Multiple answers allowed

Definition of Climate Justice	Number of Respondents	Percentage (%)
Ensuring fairness in how climate change impacts and solutions are distributed across social groups	5	56%
Holding those most responsible for climate change accountable for its effects	2	22%
Empowering vulnerable communities by giving them a voice in climate policies and decisions	4	44%

1. Ensuring Fairness in Distribution (56%)

A majority of respondents (5 out of 9) emphasized the importance of fairness in how climate change impacts and solutions are distributed across different social groups. This reflects a firm understanding that marginalized communities, such as farmers, Indigenous peoples and low-income households, often face greater climate risks while receiving fewer resources and opportunities to adapt. The selection of this principle aligns with distributive justice, which advocates for equity in the allocation of both climate burdens and adaptation benefits.

2. Empowering Vulnerable Communities (44%)

Four respondents identified empowerment and participatory governance as a key component of climate justice. This principle emphasizes the importance of giving voice and agency to vulnerable populations in the development of climate policies and decision-making. It reflects a concern for procedural justice, which goes beyond outcomes to ensure that decision-making processes are inclusive, transparent and democratic. The relatively high response rate suggests a recognition of local voices as essential in shaping climate solutions that reflect lived experiences.

3. Accountability of Major Contributors (22%)

Two respondents selected the principle of holding high-emitting entities accountable for their contribution to climate change. Although this principle received the lowest response, it remains crucial in shaping global discussions on climate reparations, corporate responsibility and international climate negotiations. The limited selection may suggest that local respondents are more concerned with immediate adaptation and equity issues than with global accountability mechanisms.

The responses reveal that respondents hold a multifaceted view of climate justice, with emphasis on both fair outcomes and inclusive processes. These perspectives are consistent with the realities of the Roxas Mountain Range, where farming communities face environmental injustice and governance challenges. The results call for climate strategies that are not only technically effective but also socially just, ensuring that solutions are equitable, locally grounded and community-led.

Climate justice based on equity and responsibility

When respondents were asked to describe climate justice from the lens of equity and responsibility, respondents revealed a range of perspectives, as summarized in **Table 7.**

Table 7. Descriptions of Climate Justice Based on Equity and Responsibility (n = 9)

Definition of Climate Justice Based on Equity and Responsibility	Number of Respondents	Percentage (%)
A system that ensures vulnerable communities receive more support in dealing with climate change	1	11%
A way to make governments and corporations responsible for climate action	2	22%
An approach to climate change that includes everyone, regardless of income or status	6	67%

The response selected by 6 out of 9 respondents (67%) was that climate justice is "an approach to climate change that includes everyone, regardless of income or status." This highlights a broad understanding of justice, emphasizing that all individuals, regardless of their socio-economic background, should be part of the climate response. This perspective aligns with the principle of inclusive justice, which ensures that climate policies do not disproportionately affect or leave behind vulnerable or marginalized populations.

Two (2) respondents (22%) viewed climate justice as "a way to make governments and corporations responsible for climate action." This response centers on the accountability dimension, reflecting concerns that large-scale polluters and decision-makers must be held liable for their contributions to the climate crisis and should play a leading role in driving solutions.

Only one (1) respondent (11%) defined climate justice as "a system that ensures vulnerable communities receive more support in dealing with climate change." While fewer respondents chose this option, it remains a vital pillar of equity-centered approaches, focusing on the just allocation of resources to those most affected by climate change.

The results show that respondents recognize the importance of equity and inclusion in climate action. However, their emphasis may differ; some focus on universal inclusion, others on institutional accountability, and a few on targeted support for vulnerable groups. These varied but complementary views reflect the multidimensional nature of climate justice and the need for integrated, principle-driven approaches in local climate policy and planning.

Climate justice based on practice on the ground

To assess the practical understanding of climate justice, respondents were asked to identify what it looks like in action or implementation. Their responses are summarized in **Table 8**, reflecting how climate justice is operationalized at the local or community level.

Table 8. Definition of Climate Justice Based on Practice

Practical Definition of Climate Justice	Number of Respondents	Percentage (%)
Protecting the rights of communities affected by climate change	2	22%
Ensuring equal access to resources for climate adaptation and mitigation	6	67%
Making sure that climate policies consider Indigenous and marginalized communities	1	11%

The most common answer, selected by six (6) out of nine (9) respondents (67%), was that climate justice involves ensuring equal access to resources for climate adaptation and mitigation. This suggests a prevailing view that climate justice must translate into a tangible, equitable distribution of support, including planting materials, financial support, technology, information and infrastructure. It reflects a practice-oriented view grounded in fairness and the right to resilience, especially for those already affected by climate-related risks.

Two (2) respondents (22%) associated climate justice with protecting the rights of communities affected by climate change. This view underscores the human rights dimension of climate action, emphasizing the need for safeguards against displacement, land loss, or exclusion that often accompany climate impacts or poorly designed interventions.

One (1) respondent (11%) highlighted the importance of including Indigenous and marginalized communities in climate policy-making. Though a minority response, this principle remains vital. It emphasizes the recognition and inclusion of historically excluded groups, especially those with traditional knowledge and unique vulnerabilities.

The results in **Table 8** show that respondents generally see climate justice not as an abstract principle, but as something measurable through inclusive access, legal

protection and cultural recognition. However, the relatively low response to the inclusion of Indigenous and marginalized groups may signal the need for stronger mainstreaming of intersectional justice and participatory governance in climate-related programs and discourse at the local level.

Climate justice based on fairness, equity, inclusion and participation

The following thematic codes emerged from the FGDs when participants were asked: **"What do fairness, equity, inclusion and participation mean to you in the context of climate change programs, and do you feel these principles are applied in your community?"**

These themes are presented in **Tables 9 to 12**, each highlighting participant responses categorized by codes, key issues and illustrative quotes. A summary of overarching insights is provided in **Table 15.**

Theme 1: Partial Inclusion and Uneven Participation

As shown in **Table 9**, participants acknowledged that while community engagement efforts are present, these remain uneven and often exclude vulnerable groups. Women, youth and barangay (*purok*) representatives are frequently involved in tree planting and clean-up drives. However, senior citizens, persons with disabilities (PWDs) and landless or informal landholders are commonly left out. Participation is often limited to the consultation phase, with minimal follow-through in planning or decision-making. Although barangay LGUs are tapped for support, actual involvement is often limited to a few individuals.

Time constraints, labor demands and uncertainties around land ownership were also noted as barriers to engagement. Others mentioned that daily work commitments hinder participation: *"May iba may trabaho kaya dili makaparticipate."*

Some respondents questioned who truly benefits from these programs, especially when participants do not own the land being reforested.

"*Ang iban, mag question if magdako ang kahoy, kinsa ang magbenefit.*" (*Others will ask: if the tree grows tall, who will benefit?*)

These findings highlight that participation is still constrained by social roles, time availability and perceived ownership or benefit from programs, which affect people's motivation to engage. This revealed an inconsistent application of inclusion, underscoring the need for mechanisms that effectively reach the most marginalized.

Table 9. Theme 1- Partial Inclusion and Uneven Participation

Category	Code	Quotes
Selective participation	Involvement of certain groups	"Yes – women, youth, *purok* involved, except senior citizens and PWD." (*Purok* refers to a sub-village or zone in a barangay.)
Limited consultation	Minimal engagement	"Until consultation only, and to some extent tapping the Barangay Local Government Unit (BLGU)."
Work and time constraints	Barriers to inclusion	*"May iba may trabaho kaya dili makaparticipate."* (*Some people have jobs so they cannot participate.*)
Ownership concerns	Land/resource rights	*"Ang iban, mag question if magdako ang kahoy kinsa ang magbenefit." (Others would question who will benefit once the tree grows big.)*

While some inclusive practices exist, participation is not holistic or sustained. Key groups such as senior citizens, PWDs and informal landholders are often left out. Time, labor and land ownership concerns also limit engagement.

When asked to define ***fairness, equity*** and ***inclusion*** in the context of climate change programs, respondents across various barangays in Koronadal City consistently emphasized that these principles mean equal opportunities for all community members to participate in and benefit from climate-related interventions, regardless of their socioeconomic status, political affiliation, or personal capacity.

Community Definitions and Interpretations

Respondents framed ***fairness*** as ensuring that everyone, regardless of social status, affiliations, or physical and financial capacity, has access to information, resources and opportunities related to environmental initiatives. ***Inclusion*** was described as ensuring that no one is left behind, particularly those who are marginalized. ***Equity*** was understood as allocating resources and support in a manner that addresses existing vulnerabilities and disparities within the community.

Moreover, respondents highlighted the importance of *meaningful participation* in climate change programs. This includes the involvement of women, youth and representatives from each *purok* in the planning, implementation and benefit-sharing processes. These values were not seen as abstract ideals, but as practical and necessary conditions for the long-term success of climate action at the grassroots level.

Many agreed that these principles are partially practiced in their communities. A notable example cited was the tree planting initiatives implemented through collaboration between the City LGU and barangay local government units (BLGUs). Barangays were invited to volunteer in areas for planting, with landowners contributing by preparing

planting sites, digging holes and planting seedlings. Specific criteria guided the selection of sites and participants, ensuring a systematic and equitable implementation.

Despite these efforts, respondents noted that the actual practice of fairness, equity and inclusion remains limited. Some community members were either unable or unwilling to participate in preparatory work, which affected their level of engagement and the benefits they received. In addition, budget constraints and limited information dissemination meant that only a few individuals were informed or involved in these programs. These issues created equity gaps that hinder broader participation and benefit-sharing.

To promote more inclusive and just climate governance, respondents recommended the following strategies:

- Expand community consultations to ensure voices from all sectors are heard.
- Strengthen information dissemination and awareness-raising at the barangay and *purok* levels.
- Adopt flexible implementation mechanisms that consider the diverse capacities of households, especially those marginalized or less connected.

Theme 2: Unequal Access to Resources and Benefits

Resource distribution across communities was another primary concern raised by participants, as detailed in Table 10. Although some barangays received seedlings and technical assistance from external agencies (e.g., DENR, ENRO, CENRO), others experienced limited access due to budget constraints, weak coordination and poor information flow.

"No – limited budget, only a few individuals can receive information regarding the program."

"Barangay Mambucal – get support seedlings from City ENRO, Provincial ENRO."

"Budget allocated for nursery, fruit trees and flowers for beautification."

The tension between programs designed for beautification and those supporting livelihoods also surfaced, with some communities perceiving that ornamental initiatives are prioritized over income-generating or resilience-building activities. Moreover, practices like exchanging tree-cutting permits for seedling donations reveal localized attempts at reciprocity, but also reflect uneven negotiation power and unclear benefit-sharing structures.

"The farmer asked for a permit to cut one *Acacia* in exchange for 200 seedlings. *Ang 200 seedlings mao ang gamiton sa tree planting sa BLGU.*" (*The 200 seedlings will be used for tree planting by the Barangay LGU.*)

Table 10: Theme 2 - Unequal Access to Resources and Benefits

Category	Code	Quotes
Budget constraints	Program reach limitations	"No – limited budget, only few individuals can receive information regarding the program."
External dependence	Support from agencies	"Mambucal – get support seedlings from city ENRO, province CENRO."
Selective benefit sharing	Community dynamics	"The farmer asked for a permit to cut one Acacia in exchange for 200 seedlings."
Beautification vs. livelihood	Mixed priorities	"Budget allocated for nursery, fruit trees, flower for beautification."

Resource allocation is uneven across communities. Beneficiaries often depend on support from external agencies, and not all households receive equal benefits. There is tension between projects designed for aesthetic purposes and those that meet livelihood needs.

Discussions also revealed that resource allocation and program benefits are not distributed equitably. While some areas receive seedlings, technical support, or funding from national agencies (e.g., DENR-EMB, City ENRO, or CENRO Banga), others face limited access due to budget constraints or lack of coordination. For instance, one respondent shared: *"No – limited budget, only few individuals can receive information regarding the program."*

The reliance on external support also shaped perceptions of sustainability. Some programs were perceived as temporary or symbolic, particularly those focused on beautification (e.g., planting flowers), rather than livelihood or resilience-building. Furthermore, localized examples of negotiated exchanges, such as cutting one acacia tree in exchange for planting 200 seedlings, highlighted community-driven strategies but also pointed to disparities in negotiation power and support mechanisms.

Theme 3: Mixed or Conditional Perceptions of Fairness

Respondents' views on fairness varied as shown in Table 11. Some perceived programs to be fair because they followed selection criteria, such as willingness to provide labor or land, while others felt excluded due to their inability to meet these conditions or because they were not fully informed about the programs.

"Tree planting – may criteria as basis for tree planting." (*There is a set of criteria used as the basis for who can participate in tree planting.*)

"Program benefited all, except *sa may tao dili willing sa preparation sang area*." (*The program benefited everyone except those not willing to help prepare the planting area.*)

"Yes and No at the same time."

"*Depende sa program and sa pag-accept ng community kasi gusto nila minsan instant.*" (*It depends on the program and how the community accepts it, because sometimes they want instant results.*)

These responses suggest that fairness is often perceived conditionally, shaped by structural limitations, individual effort and the design of the program.

Table 11: Theme 3 - Perceptions of Fairness – Mixed or Conditional

Category	Code	Quotes
Conditional fairness	Based on effort or criteria	"Tree planting – may criteria as basis for tree planting."
Resentment or exclusion	Perceived unfairness	"Program benefited all, except *sa may tao dili willing sa preparation sang area*."
Dual perceptions	Mixed views on fairness	"Yes and No at the same time."
Program acceptance	Community preferences	"*Depende sa program and sa pag-accept ng community kasi gusto nila minsan instant*."

Fairness is seen as situational. Programs may be deemed fair if people qualify based on specific criteria or their level of effort; however, others may feel excluded due to structural or behavioral barriers. Some communities desire immediate benefits, making long-term programs less attractive.

Respondents expressed varied views on whether current climate programs are fair and equitable. Some respondents affirmed that selection for participation followed clear criteria, such as willingness to contribute land or labor: *"Tree planting – may criteria as basis for tree planting (there are criteria that serve as the basis for tree planting)".* However, others pointed to tensions and perceived favoritism or exclusion, especially when benefits were unclear or unequally shared.

Notably, several respondents recognized that fairness depends on effort and compliance with program requirements. In contrast, others questioned the sustainability of initiatives: *"Ang iban, mag question if magdako ang kahoy kinsa ang magbenefit" (Others may ask, if the tree grows big, who will benefit from it?).* One respondent summed it up as *"Yes and No at the same time,"* reflecting conditional trust in the fairness of program delivery.

Community acceptance also emerged as a key factor in success. Programs that required sustained participation were often met with limited enthusiasm when immediate results were not evident: *"Depende sa program and sa pag-accept ng community kasi gusto nila minsan instant." (It depends on the program and the community's acceptance because sometimes they want instant results.)*

Participation and Inclusion in Climate Change Programs

Participation and inclusion are essential components of climate justice, particularly in farming communities that are both highly vulnerable to climate risks and rich in

traditional knowledge. To explore how these principles are practiced in the Roxas Mountain Range, respondents were asked about the involvement of community members in climate change programs, including their role in decision-making, the barriers they face, and the inclusion of vulnerable groups such as women, youth and Indigenous peoples.

To better understand the dynamics of community engagement in local climate change initiatives, respondents were asked a series of questions exploring their experiences with participation and inclusion. Specifically, the discussion aimed to answer the following guiding questions:

- How are farming communities involved in climate change programs?
- What factors enable or hinder their participation?
- How are vulnerable groups, such as women, youth and Indigenous peoples, included or excluded in these initiatives?

The responses to these questions provided valuable insights into the opportunities and barriers that shape community involvement in climate adaptation and mitigation efforts. The emerging themes from the FGD are presented and analyzed in the sections below, with a summary shown in Table 12**.** The responses yielded several key themes, including survival-based thinking, limited participation, attitudinal resistance, educational needs and the implicit exclusion of vulnerable groups. Participant quotes and interpretive insights support each theme.

Table 12. Thematic Codes for Participation and Inclusion

Category	Code	Quotes
Survival-Oriented Mindset	Limited awareness	**"**Using traditional farming methods and techniques", "They only think of how to survive their daily needs not knowing or understanding what climate change is."
Limited Participation	Consultation and organizing	"Consultation dialogue for awareness." "Community organizing."
Attitudinal Barriers	Resistance to change	"Close-mindedness for project programs and difficulty in accepting new technology."
Need for Capacity-Building	Community education	"It can be addressed by educating the community."
Exclusion of Vulnerable Groups	Implicit exclusion	*(No direct quote; the absence suggests lack of inclusion of women, youth and IPs)*

Community participation or voice in climate-related decision-making

To explore perceptions of community inclusion in governance processes, respondents were asked: "Do you feel that your community has enough voice in climate-related decision-making?" The results are summarized in **Table 13** below.

Table 13. Perceived Community Voice in Climate-Related Decision-Making (n = 9)

Response	Number of Respondents	Percentage (%)
Yes	6	67%
No	1	11%
Unsure	2	22%

As shown in **Table 13**, six (6) out of nine (9) respondents (67%) believe that their community has sufficient voice in climate-related decision-making processes. However, one (1) respondent (11%) expressed that their community does not have enough influence, while two (2) respondents (22%) were unsure about their level of participation.

While the majority indicates a degree of inclusion, the presence of uncertainty and dissent suggests that gaps in participatory governance still exist. The "unsure" responses may reflect limited access to information, unclear roles in local planning processes, or lack of transparency in how decisions are made.

These findings underscore the importance of strengthening inclusive mechanisms, such as participatory planning workshops, community consultations and multi-stakeholder platforms, to ensure that local voices, particularly those from vulnerable and farming communities, are effectively heard and integrated into climate-related decisions.

Theme 4: Survival-Oriented Mindset Limits Awareness and Engagement

The involvement of farming communities in climate change initiatives remains limited and uneven, mainly due to a prevailing focus on daily survival and the continued reliance on traditional farming practices. Respondents observed that many farmers prioritize meeting their immediate subsistence needs, which often overshadows awareness of climate change and the importance of long-term planning.

"Using traditional farming methods and techniques, they only think of how to survive their daily needs, not knowing or understanding what climate change is."

This quote highlights a pervasive, short-term, survival-based mindset that hinders proactive engagement with adaptation and mitigation strategies. The pressing need to secure food and income daily reduces the capacity, and in some cases, the willingness, to explore or invest in more strategic, science-informed interventions.

Many farmers remain grounded in age-old techniques and demonstrate limited awareness of the concept of climate change, its impacts on agriculture, or the long-term benefits of participating in resilience-building programs. Consequently, their engagement in climate initiatives tends to be superficial, often lacking sustained involvement or commitment to the program's goals.

This theme highlights the crucial need for context-sensitive awareness campaigns and capacity-building efforts that not only inform farmers about climate risks but also connect climate action to their immediate livelihood needs and long-term well-being.

Theme 5: Participation Exists but is Limited in Depth

When asked whether their communities have been involved in the planning or decision-making of climate-related programs, respondents confirmed that some efforts have been made, primarily through consultation dialogues and community organizing activities aimed at raising awareness and encouraging participation. However, these engagements often stop at the level of information sharing, with limited opportunities for deeper involvement in shaping or co-designing interventions.

Respondents identified consultation dialogues and community organizing as the most common forms of engagement. While there are ongoing efforts to engage communities through consultation and organizing, these actions tend to be surface-level and do not yet support meaningful involvement in program design or decision-making.

These responses suggest that participation is primarily informational or preliminary, with few opportunities for deeper involvement in decision-making processes. While these early-stage efforts represent progress, they do not necessarily translate to empowerment or long-term involvement.

Theme 6: Resistance to Change as a Barrier

Resistance to new ideas and technologies emerged as a significant challenge. Respondents described community members as hesitant or dismissive of unfamiliar practices.

One of the key challenges identified is close-mindedness or resistance to change, particularly when it comes to adopting new technologies or practices that diverge from traditional methods. This hesitation is exacerbated by low levels of environmental education, weak program follow-through, and a lack of tangible incentives for adopting climate-smart practices. To address this, participants emphasized the need for continuous community education and capacity-building, which would help shift mindsets and build trust in science-based interventions. This reflects an attitudinal barrier, where skepticism or fear of failure limits openness to innovation. Such resistance may be rooted in cultural conservatism, negative past experiences, or a lack of trust in implementing institutions. It emphasizes the need for long-term trust-building and participatory education.

Theme 7: Education as a Solution to Promote Inclusion

To address these challenges, respondents emphasized the importance of community education. As they commented, "It can be addressed by educating the community."

This points to a strong demand for capacity-building initiatives, including climate literacy, participatory workshops and practical demonstrations of technologies. Education is viewed not just as the dissemination of knowledge, but as a pathway to engagement, empowerment and ultimately, co-ownership of solutions.

In terms of inclusion, certain groups continue to be marginalized or underrepresented in climate initiatives. Vulnerable sectors such as women, youth and Indigenous peoples are often acknowledged in principle, but not consistently involved in meaningful ways. Engagement of farming communities in decision-making is often tokenistic or superficial, with few mechanisms in place for institutionalizing their voices in program design, implementation, or evaluation.

Theme 8: Implicit Exclusion of Vulnerable Groups

Although respondents were explicitly asked about the role of women, youth and Indigenous peoples, their responses did not mention these groups in detail. This absence itself is revealing and suggests that such groups may be underrepresented or invisible in the context of climate programming.

The silence points to a lack of formal mechanisms or targeted strategies to ensure their inclusion. While Table 3 does not contain direct quotes about their exclusion, the absence of mention underscores a structural gap in inclusivity that warrants further investigation and action.

Strategies for Inclusive and Forward-Looking

Despite the challenges discussed, respondents offered several practical and forward-looking strategies, summarized in **Table 14.** These include the provision of incentives for community members to sustain tree-growing efforts, along with improvements in environmental management infrastructure (e.g., drainage, waste disposal).

Table 14: Recommendations and Calls for Improvement

Category	Code	Quotes
Incentive systems	Motivation for participation	"Suggestion: *Dapat may ara pundo, na pag nabuhi may incentives.*"
Addressing structural issues	Dumping, drainage, odor	"Concern *ang dumpsite ang baho sa basura… pag nagbara, naga-anod sa mga purok.*"
Hope for solutions	Expressed need for change	"*Tani may paagi na solution.*"

Respondents suggest more sustainable and motivating strategies, such as providing incentives for successful planting. They also point to broader environmental problems (e.g., dumpsites, drainage) that intersect with climate justice and call for localized solutions.

Despite the challenges, respondents also articulated constructive recommendations. Several emphasized the importance of providing incentives to motivate community engagement and sustain tree-growing efforts: "*Dapat may ara pundo, na pag nabuhi may incentives.*" (*There should be a fund so that when the tree survives, there is an incentive.*)

Others pointed to the need for solutions that address broader environmental management issues, such as waste disposal and drainage: "Concern *ang dumpsite ang baho sa basura... pag nagbara, naga-anod sa mga purok.*"(*The dumpsite smells bad… when it clogs, waste flows into the puroks.*) "*Tani may paagi na solution.*"(*Hopefully, there will be a way to solve this.*)

The responses reflected a desire for climate programs that are not only technically sound but also socially responsive, community-driven and context-sensitive. They recommended expanding consultations, calling for transparency, strengthening barangay-level information campaigns, equitable access to resources, and adopting flexible implementation mechanisms that consider the diverse capacities of local households, as well as inclusive engagement of marginalized groups, and long-term support to sustain environmental initiatives.

A synthesis of the four (4) major themes is provided in **Table 15**, which outlines the main issues and insights from the FGDs.

Table 15. Summary of Themes and Insights

Theme	Insight
Partial inclusion and uneven participation	Not all community sectors are engaged equally; seniors, PWDs and landless groups are often excluded.
Unequal access to resources and benefits	Budget limitations and external dependency create gaps in resource distribution.
Perceptions of fairness – mixed or conditional	While some see programs as fair, others feel excluded due to social, structural, or behavioral reasons.
Recommendations and calls for improvement	There is a strong desire for incentive-based, inclusive and context-sensitive strategies.

Barriers and Perceptions of Benefit Distribution

Beyond structural limitations, perceptions of benefit and land ownership have also shaped participation. Some residents choose not to engage in reforestation because the trees are planted on land they do not own, leading to the question: "Who benefits when the trees grow?" Others remain dependent on charcoal-making (*ulingon*), which is increasingly discouraged by forest protection initiatives. This disconnect between livelihood realities and program goals limits both buy-in and impact.

Respondents also raised concerns about budget constraints and a lack of manpower as significant barriers to implementing inclusive programs. There is often an expectation from residents for instant results, which does not align with the slow and cumulative nature of environmental programs. As a result, many initiatives struggle with continuity and community ownership.

The results indicate that while the core principles of climate justice, fairness, equity, inclusion and participation are acknowledged and partially applied in farming communities across Koronadal City, their practical implementation remains fragmented and inconsistent. Participation is often limited in both scope and depth, with meaningful engagement hindered by various factors, including economic precarity, limited climate awareness and resistance to unfamiliar technologies. Although consultation mechanisms are present, they do not consistently lead to active or sustained involvement, particularly among vulnerable groups such as women, youth, senior citizens and informal landholders. Moreover, the perception of fairness varies depending on an individual's social status, geographic location and role in program implementation, revealing gaps in how resources and responsibilities are distributed. Inclusion is uneven, and specific sectors of the community continue to be excluded from both planning and benefit-sharing processes. Despite these challenges, respondents offered constructive and contextually grounded recommendations. They emphasized the need for community-led, incentivized and adaptive strategies that are responsive to both local environmental and social realities. Education emerged as a

potent tool, with participants recognizing its potential to raise awareness, shift attitudes, and foster long-term behavioral change.

The findings suggest that achieving climate justice at the local level requires programs to go beyond token consultations and one-size-fits-all solutions. Instead, they must adopt inclusive, sustained and empowering approaches that intentionally engage marginalized groups, ensure transparent processes, and build trust within communities. Only through such integrated and participatory strategies can climate justice be meaningfully realized on the ground.

Climate-Related Policies, Programs, and Initiatives Implemented

Meaningful participation and consultation are crucial for ensuring that climate-related policies and projects reflect the actual needs, values and priorities of local communities. When communities are engaged in climate governance processes, the resulting interventions tend to be more just, inclusive and effective. To assess the level of community involvement, the study asked: *"Have you or your community been consulted in any climate-related policies or projects?"*

All respondents (100%) affirmed that their community has been consulted in climate-related policies or projects. This unanimous response highlights a strong level of engagement between policymakers and grassroots stakeholders in the study area. Such consistent consultation suggests that participatory mechanisms are in place and are being actively implemented, which is a positive indication of inclusive governance practices. However, while consultation is a promising sign, future analysis should also examine the depth, frequency and impact of this participation to ensure it goes beyond tokenism and leads to genuine community influence on decision-making.

The climate-related policies, programs and projects initiated in Koronadal City aimed to enhance local adaptive capacity, safeguard natural resources and provide livelihood alternatives in the face of climate risk, with a particular focus on farming communities in the Roxas Mountain Range.

As shown in **Table 16**, all nine (9) respondents (100%) confirmed that their LGU is either implementing or supporting climate change-related programs within their jurisdiction. This unanimous response suggests a strong institutional commitment to climate action at the local level.

Table 16. LGU Support for Climate Change-Related Programs (n = 9)

Response	Number of Respondents	Percentage (%)
Yes	9	100%
No	0	0%

The high level of LGU engagement may reflect growing awareness of the local impacts of climate change, particularly in climate-sensitive areas like the Roxas Mountain Range, and the corresponding need for proactive interventions.

Climate-Related Programs Implemented or Supported by LGUs

Table 17 presents the variety of climate-related programs that LGUs in the respondents' observation have implemented or supported. The responses reflect a broad spectrum of adaptation, mitigation and capacity-building strategies, indicating the multidimensional nature of local climate action.

- Reforestation and forest protection programs emerged as the most universally supported initiative, reported by 100% of respondents (9 out of 9). This shows strong alignment with natural climate solutions, recognizing forests as vital for carbon sequestration, biodiversity and disaster risk reduction.
- A majority (77.78%) reported implementation of climate adaptation programs in agriculture, such as support for resilient crops and irrigation. This reflects the LGUs' prioritization of climate-resilient livelihoods, primarily for farming communities highly vulnerable to droughts, flooding and seasonal variability.
- Similarly, capacity-building efforts, including training on sustainable agriculture and environmental management, were supported by seven (7) respondents (77.78%). This demonstrates an investment in empowering stakeholders with the knowledge and skills necessary to implement adaptive practices at the grassroots level.
- Water resource management and conservation also received significant attention, with seven (7) respondents (77.78%) highlighting LGU efforts to protect and optimize water resources amid changing rainfall patterns and watershed stress.
- Community awareness and education programs were also widespread, acknowledged by six (6) respondents (66.67%). These initiatives are crucial for promoting behavioral change, fostering local ownership of climate solutions, and ensuring inclusive participation in decision-making.
- Climate-smart infrastructure projects, such as flood control systems, were reported by five (5) respondents (55.56%). This indicates a growing recognition of the need for resilient physical infrastructure, although technical or financial constraints may limit implementation.
- Lastly, renewable energy promotion and implementation was the least cited, with only four (4) respondents (44.44%). While still notable, this lower response may reflect challenges in scaling clean energy technologies at the local level, especially in rural or resource-limited areas.

Table 17. Climate-Related Programs Implemented or Supported by LGUs (n = 9)

Climate-Related Program	Number of Respondents	Percentage (%)
Reforestation and forest protection programs	9	100%
Climate adaptation programs for agriculture (e.g., resilient crops, irrigation support)	7	77.78%
Capacity-building and training on sustainable agriculture or environmental management	7	77.78%
Water resource management and conservation program	7	77.78%
Community awareness and education on climate change	6	66.67%
Climate-smart infrastructure projects (e.g., flood control)	5	55.56%
Renewable energy promotion and implementation	4	44.44%

The data demonstrates that LGUs in Koronadal City are actively engaged in a range of climate-related programs, with the greatest emphasis on forest conservation, agricultural resilience, capacity building and water resource management. These efforts encompass both reactive and proactive measures to address climate impacts. However, areas such as renewable energy and infrastructure resilience may benefit from additional support, funding and policy attention to further strengthen local climate adaptation and mitigation systems.

The above result is encouraging, as LGUs serve as frontline actors in climate governance. Their support is essential in translating national policies into concrete local actions that address both mitigation and adaptation needs.

However, while implementation is confirmed, further inquiry is needed to assess the effectiveness, inclusivity and sustainability of these programs. Questions such as the extent of community participation, availability of funding, inter-agency coordination and integration with long-term development plans would provide a more nuanced understanding of how effectively these climate initiatives are being implemented.

Perceived Effectiveness of Climate Change Initiatives in the Locality

As shown in **Table 18**, most respondents view local climate initiatives as somewhat effective (5 out of 9, or 55.56%), while a significant portion (4 respondents or 44.44%) consider them very effective. Notably, none of the respondents assessed the initiatives as ineffective or very ineffective.

Table 18. Perceived Effectiveness of Climate Change Initiatives in the Locality (n = 9)

Level of Effectiveness	Number of Respondents	Percentage (%)
Very effective	4	44.44%
Somewhat effective	5	55.56%
Ineffective	0	0%
Very ineffective	0	0%

This positive feedback highlights a general confidence in the direction and implementation of climate-related programs at the local level. Respondents recognize the tangible benefits and impacts of interventions such as reforestation, support for sustainable agriculture, climate education and infrastructure for disaster preparedness.

The responses suggest that:

- LGU initiatives are perceived as producing meaningful outcomes, though there may still be room for improvement in scope, sustainability, or inclusivity.
- The absence of negative responses (i.e., "ineffective" or "very ineffective") reflects a level of satisfaction and perceived relevance of current programs in addressing local climate vulnerabilities.

However, the high number of "somewhat effective" responses implies that stakeholders may see potential for strengthening existing efforts. This could involve expanding coverage, enhancing community participation, increasing funding, or improving coordination between agencies.

Local climate actions are seen as positively contributing to climate adaptation and mitigation. However, a shift toward greater effectiveness and transformative outcomes will require strategic improvements, long-term planning and more inclusive governance mechanisms.

In support of the survey results, findings from the FGDs, as well as a climate change-related program spanning four (4) key thematic areas —agricultural support and risk protection, environmental protection and forestry, livelihood diversification, and community-based ecological restoration and engagement —were also considered. To capture and consolidate the findings, **Table 19** below presents a summary of the climate-related policies, programs and initiatives currently implemented in Koronadal City. It includes specific examples, observed impacts on the communities, particularly those in the Roxas Mountain Range, and recommendations proposed by the participants to improve program implementation and effectiveness.

Table 19: Existing climate policies, programs and initiatives based on FGDs in Koronadal City, particularly with farming communities in the Roxas Mountain Range.

Category	Programs/ Initiatives	Details/ Examples	Impacts	Recommendations for Improvements
Agriculture support	Agricultural inputs distribution	Seeds and fertilizers provided to farmers	Enhances productivity and resilience to climate variability	Ensure timely and sufficient provision; expand to more beneficiaries
	Philippine Crop Insurance Corporation (PCIC) facilitation	Crop insurance coverage through the PCIC	Provides financial safety nets in case of crop failure	Improve access and awareness among smallholder farmers
Environmental protection & forestry	Tree planting activities	City Tree Growing Festival Barangay-level tree planting during fiestas SK-led tree planting Green Day programs in *purok*s	Contributes to reforestation, erosion control and biodiversity conservation	Strengthen monitoring and survival rates of planted trees.
	Forest Land Use Plan (FLUP)	Guides forest management policies and land use planning	Provides legal framework and planning tool for sustainable forest use	Update regularly and ensure community awareness

Community engagement & clean-up	Clean-up drives	Ordinance-mandated twice-monthly barangay clean-ups Waterway clean-ups every March River Clean-up Days "Basura Attack" campaigns	Promotes solid waste management and reduces flood risks	Intensify Information Education Campaigns and proper waste segregation practices
Alternative livelihoods	Livelihood Improvement through Facilitated Extension program	Livelihood improvement for environmental protection Supports income shift from charcoal-making and *kaingin* to sustainable alternatives	Reduces deforestation and improves household income	Expand livelihood options and training
	Sustainable eco-tourism	Community-based tourism in natural areas	Provides additional income and promotes conservation	Strengthen tourism facilities and market linkages

Agricultural Resilience and Risk Protection

One of the cornerstones of Koronadal City's climate response is ensuring agricultural resilience. Programs such as the distribution of agricultural inputs (seeds and fertilizers) and facilitation of crop insurance through the PCIC help mitigate the impact of erratic weather events on food production.

These interventions, which emphasize the importance of targeted input support and risk transfer mechanisms such as crop insurance, enhance adaptive capacity and reduce poverty vulnerability among smallholder farmers.

Environmental Protection through Greening Initiatives and Clean-up Drive

Koronadal City's environmental agenda is visibly driven by reforestation programs such as the City Tree Growing Festival, SK-led initiatives and barangay-level tree planting during fiestas.

The Tree Growing Festival, also known as the Koronadal City Tree-Growing Program, is an annual environmental initiative that began in 2011. It aims to address deforestation and enhance climate resilience, particularly in the Roxas and Quezon Mountain Ranges. June 29 is declared a non-working holiday and thousands of volunteers from different sectors are mobilized to plant hundreds of thousands of seedlings in designated upland, riparian and roadside areas. The City Government, DENR, barangays, NGOs and upland farmers collaborate to manage the program, ensuring the production of seedlings, site preparation and long-term maintenance. The program has achieved significant progress in reforestation, watershed protection, urban greening and income generation for farmers, creating lasting livelihoods through farmer-managed nurseries. The program offers ecological rehabilitation and community development, fostering a robust culture of community involvement, civic pride and sustainable local governance practices, which have led to recognition and awards , including the Seal of Good Local Governance.

Local tree-planting efforts rooted in community values and festivals yield better participation and ecological outcomes. They not only enhance carbon sequestration but also contribute to erosion control and regulate the microclimate. The FLUP further provides the institutional backbone for these efforts, promoting rationalized land allocation and multi-sectoral participation in forest governance. Regular updating and participatory formulation of the FLUP were also recommended to ensure relevance and inclusivity.

Additionally, community-wide clean-up activities, such as the "Basura Attack" campaigns, river clean-ups and ordinance-mandated barangay clean-up days, reflect a strong grassroots commitment to ecosystem restoration and solid waste management. These actions not only reduce flood risks but also promote behavioral change through consistent visibility and participation.

The National Framework Strategy on Climate Change promotes such localized, ecosystem-based approaches as cost-effective solutions for urban and rural resilience. The role of civic engagement in sustaining environmental behavior change, particularly when linked to local ordinances and incentives, is crucial.

Livelihood Diversification and Sustainable Transitions

To address the economic drivers of environmental degradation, such as *kaingin* and charcoal-making, Koronadal City has adopted the LIFE Program, introduced through the Landcare Foundation of the Philippines, which supports transitions to agroforestry, eco-tourism and other sustainable enterprises. These programs help reduce dependence on extractive practices while providing alternative income sources.

As emphasized by the participants, community-based livelihood interventions that integrate environmental protection with income generation are key to achieving sustainable land management in upland areas. The success of such programs depends on long-term support, skills training and access to value chains and markets.

Empowered Community Organizations and Participatory Governance

Women's groups, irrigators' associations and 4Ps beneficiaries have formal roles in environmental and livelihood programs through Memoranda of Agreement (MOAs), showcasing participatory governance in climate action. This reflects the growing emphasis on social inclusivity in climate resilience frameworks, as reinforced by Ostrom's (2009) theory of collective action and more recently by the IPCC (2022), which stresses the importance of inclusive governance as central to effective adaptation. Community collaboration with the LGU is visible and acknowledged in Roxas Mountain Range communities.

Collaboration Among LGUs, NGOs and Other Stakeholders

LGUs, NGOs and other stakeholders, including national agencies and academia, play a crucial role in addressing climate change within farming communities. These partnerships are often realized through programs and projects co-developed or co-implemented with the support of national agencies and local governments, such as the Philippine Rural Development Project. The education sector and NGOs also participate in these collaborative efforts, often providing technical support, research and community training. While some respondents did not cite specific partnerships (indicating "none"), others acknowledged that these collaborations have resulted in livelihood projects and climate-related initiatives being delivered to local communities. However, the effectiveness of these partnerships varies depending on the level of coordination, transparency and sustained community involvement. When properly aligned with local needs and supported by adequate resources, such collaborations prove to be effective mechanisms for scaling climate action; however, they must be continually strengthened to ensure long-term impact and inclusive participation.

Challenges in Implementing Climate Change Strategies

Table 20 presents the perceived barriers that limit community access to climate-related programs in the locality. Among the four (4) options presented, financial constraints were the most prominent barrier, cited by eight (8) out of nine (9) respondents (88.89%). This finding reflects the reality that limited economic resources continue to be a key obstacle to adopting or benefiting from climate initiatives, particularly among rural or under-resourced communities.

The second most reported barrier was lack of community participation, identified by five (5) respondents (55.56%). This suggests that while programs may exist, engagement strategies may be insufficient, or a gap may exist between planning and implementation at the grassroots level. Factors such as low trust, fatigue from top-down approaches, or exclusion from decision-making could contribute to this issue.

Lack of information was cited by three (3) respondents (33.33%), highlighting a communication and awareness gap. Even when programs are available, communities may not be fully aware of their existence, eligibility, or the potential benefits they offer. This calls for more inclusive and accessible information dissemination through local channels.

Bureaucratic challenges, although least reported (one (1) respondent or 11.11%), still indicate the presence of administrative bottlenecks, such as complex requirements, slow fund releases, or overlapping mandates, that can delay or discourage participation in climate programs.

Table 20. Barriers to Accessing Climate Programs (n = 9)

Identified Barrier	Number of Respondents	Percentage (%)
Financial constraints	8	88.89%
Lack of community participation	5	55.56%
Lack of information	3	33.33%
Bureaucratic challenges	1	11.11%

While climate programs are being implemented, the findings in Table 20 suggest that systemic and socioeconomic barriers hinder their full accessibility and effectiveness.

To complement the survey findings, FGD participants also enumerated various climate-related activities, ranging from concrete programs, such as tree planting and livelihood support, to more abstract governance frameworks, including the FLUP. Cultural events, such as fiestas, and the passing of local ordinances, are recognized as strategic entry points for implementing these activities.

One of the biggest challenges, as mentioned by FGD participants, in implementing climate change adaptation and mitigation strategies in farming communities within

Koronadal City, particularly in the Roxas Mountain Range, is the attitude and level of participation among community members. While some actively support environmental initiatives, others demonstrate reluctance or difficulty in accepting new projects and programs, especially those requiring changes in traditional farming practices or livelihood sources. This hesitance may stem from limited awareness, past experiences with unsustained interventions, or a lack of immediate tangible benefits. These attitudinal and participation-related barriers can significantly impact the effectiveness of adaptation and mitigation efforts, ultimately limiting improvements in resilience, food security and sustainable livelihoods.

Sabino (2021) highlighted that current adaptation approaches or strategies are short-term or "stop-gap" solutions, such as shifting planting dates or using drought-resistant crops. These do not address the underlying causes of vulnerability. Sabino's 2021 study highlighted a transformative solution that will create profound changes, including:

- Investing in children's education and financial management
- Family planning and diversifying livelihoods (both on-farm and non-farm)
- Promoting agroforestry, water impoundment technologies and advanced early warning systems.

Strategies for Improving Pathways to Climate Justice

Farming communities in the Roxas Mountain Range are confronted with a cumulative blend of climate stress, both episodic and seasonal, that has enormous impacts, including landslides and flooding during wet seasons, and long-lasting droughts during dry seasons, such as the five-month 2024 drought. They not only limit agricultural productivity but also strengthen existing economic and social inequalities. Poorer families are disproportionately affected as they are more vulnerable and less capable of recovering. In this regard, climate change is not only an environmental issue but also a matter of justice and equality, underscoring the importance of climate justice.

Considering these vulnerabilities and in pursuit of climate justice and sustainability, the survey results and FGD participants suggested targeted strategies.

Strategies Identified to Support Climate Justice in Farming Communities

Table 21 presents consolidated insights gathered from nine (9) key informants on strategies or policy aspirations that can better support farming communities in achieving climate justice. The responses were grouped under seven thematic areas, each addressing critical dimensions of climate action and rural development, including agricultural support, disaster preparedness, governance, education, land use and sustainable energy.

The results highlight a strong consensus among respondents on the need for integrated, localized and participatory approaches to addressing the vulnerabilities and aspirations of farming communities that are facing the brunt of climate change.

Table 21. Strategies and recommendations to better support farming communities in advancing climate justice.

Thematic Area	Top Strategies	No. of Respondents (n = 9)	%
1. Increasing climate-resilient agricultural support	Provide subsidies for climate-resilient crops and sustainable practices	7	77.78%
	Invest in R&D of drought/flood-resistant crops	5	55.56%
	Implement crop insurance programs for smallholder farmers	4	44.44%
2. Strengthening disaster risk reduction and adaptation strategies	Enhance LGU disaster preparedness programs for farming communities	8	88.89%
	Improve rural infrastructure (e.g., irrigation, drainage)	5	55.56%
	Establish early warning systems for extreme weather events	4	44.44%
3. Enhancing access to financial and technical assistance	Strengthen agricultural extension services for climate-smart farming	8	88.89%
	Provide low-interest loans and grants for climate-adaptive technologies	4	44.44%
	Offer incentives for adopting sustainable land management	4	44.44%
4. Promoting inclusive and participatory governance	Strengthen partnerships between LGUs, NGOs and farmer cooperatives	7	77.78%
	Implement community-driven climate action programs	5	55.56%
	Ensure farmer representation in local climate decision-making	4	44.44%

5. Improving land use and resource management policies	Promote agroforestry and ecosystem-based farming solutions	7	77.78%
	Enforce strict regulations on deforestation and land conversion	5	55.56%
	Develop policies to protect Indigenous lands and ancestral domains	4	44.44%
	Others: Local ordinances for forest land use; Promote ecotourism	1 each	11.11%
6. Expanding climate education and awareness	Strengthen collaboration with academic institutions for climate literacy	7	77.78%
	Conduct regular climate education for farmers	6	66.67%
	Integrate climate and sustainability topics into agri-training	6	66.67%
7. Supporting renewable energy and sustainable practices	Implement GHG reduction programs in agriculture	6	66.67%
	Provide funding for waste-to-energy and composting projects	6	66.67%
	Encourage use of renewable energy (solar, wind, biogas) in farms	5	55.56%

The most widely supported recommendations include:

- Enhancing LGU preparedness (88.89%)
- Strengthening agricultural extension services (88.89%)
- Promoting agroforestry and academic collaborations (77.78%)
- Subsidizing climate-resilient farming (77.78%)

These findings reflect a collective recognition that achieving climate justice in rural farming areas must go beyond technical interventions; it must be inclusive, education-based, community-driven and rooted in local governance structures.

Such approaches are vital to empower farmers not just to adapt to climate risks but to thrive under a changing climate, with access to sustainable livelihoods, equitable resources and active participation in shaping their future.

Strategies identified based on the FGD

1. Environmental Policy and Livelihood Initiatives

Incentivized reforestation programs and clean-up efforts were considered two-fold interventions, restoring degraded ecosystems while enhancing people's involvement.

One primary policy concern was identified as the lack of proper regulations for cutting down trees, particularly ipil-ipil *(Leucaena leucocephala)* and mahogany *(Swietenia macrophylla)*. Farmers are generally hesitant to plant trees, fearing they may not be able to cut them down if needed. It is essential to maintain clear and consistent policy communication regarding regulated replanting and cutting, especially in protected areas and riparian corridors, to enhance participation and inform land-use planning.

2. Supportive Partnerships

An enhanced partnership with LGUs, such as the City Agriculture Office, was suggested to improve access to agricultural inputs, including fertilizers (*abono*), and to promote alternative livelihoods. There is also a need to increase collaboration among stakeholders and adequate funding, particularly in underutilized areas, due to financial constraints.

The FGD participants also emphasized the importance of sustained monitoring and evaluation of climate efforts. Regular checks can monitor progress, correct implementation gaps and ensure accountability. The engagement of various actors, including government, civil society and community-based organizations, was also deemed important, not only to raise resources, but also to access human resources, technical expertise and cross-sectoral capabilities to implement interventions on a large scale at the landscape level.

3. Capacity Building and Sustainable Agriculture:

IEC and extensive orientation on agricultural methods, such as the Sloping Agricultural Land Technology (SALT), were emphasized to enhance the adaptive capacity and long-term resilience of farmers.

4. Water Security Solutions

Technologies such as rainwater harvesting systems are recommended as effective practices to mitigate vulnerability to water scarcity and drought.

All FGD participants emphasized the importance of education and awareness creation in empowering people. An educated citizenry will readily appreciate the ultimate benefits of climate interventions, actively participate in their implementation and adopt climate-smart practices. Education also fosters ownership, which is crucial in overcoming resistance to new initiatives.

Improving Systemic Pathways to Climate Justice

In its most basic sense, the philosophy of climate justice is where the concepts of participation, sustainability, human rights and equity converge. It acknowledges that those most impacted by climate change are usually least responsible for creating it, and it demands radical change to reverse this imbalance.

Based on literature reviews, focus group discussions and key informant surveys, this paper identified six primary paths to climate justice:

1. Participatory and Inclusive Governance

FGD participants complained about vague policies, particularly those related to controlled tree cutting and land use, which deter planting in conservation and riparian zones. This highlights the importance of rights-based, inclusive governance that is transparent in communicating environmental policy and ensuring equitable access to resources. The FLUP is a governance structure that can be improved through community engagement, ensuring policies are inclusive and enforceable. The FLUP was cited as a governing system in place, but gaps in implementation, e.g., tree-cutting regulations not clearly defined, deter participation. Farmers are wary of planting ipil-ipil and mahogany trees because they are unsure of the laws governing harvesting.

Institutional changes that involve local voices in policymaking, clarify tenure and land use rights, and enhance transparency are crucial for building trust and ensuring long-term cooperation on climate action. To advance climate justice, policies should be inclusive, clearly communicated and co-designed with the people they affect. Participatory governance ensures that decisions capture the voices of those most impacted by climate change, particularly smallholder farmers.

2. Community-Led and Contextualized Adaptation.

This places local knowledge center stage, through gender-sensitive planning and all-encompassing capacity development.

Adaptation initiatives must be based on local knowledge and conditions. Empowering farmers' communities to drive adaptation processes increases ownership, sustainability and applicability of interventions. FGD participants adopted SALT technologies and rainwater harvesting, learned from training and seminars provided by LGU partners. These bottom-up alternatives underscore the importance of empowering farmers to develop and implement context-specific adaptation measures. Efforts at adaptation must address the realities of agricultural communities, and their knowledge and experience must be recognized as the basis for building effective climate resilience.

3. Equitable Access to Resources and Livelihood Support

Unequal access to fertilizers (*abono*), and financial incentives were raised as these are manifestations of underlying adaptive capacity inequalities among farmers. Climate justice demands equitable access to climate finance, inputs and support systems for all, particularly the most vulnerable communities. Redressing these inequalities enhances resilience and sustainability.

4. Education and Intergenerational Empowerment

This enables youth participation, long-term thinking and investment in climate education. FGD participants strongly emphasized the importance of education and IEC in creating awareness, reducing resistance to new programs, and ensuring long-term resilience. Young people and future generations were seen as major stakeholders. Sustained climate action will require climate education, awareness and the participation of

young people. Investing in intergenerational learning ensures the transmission of climate-conscious practices and leadership within communities.

5. Integrated Monitoring, Innovation and Stakeholder Engagement

There is a need for improved project monitoring, evaluation and enhanced multi-stakeholder coordination to provide technical expertise and human resources. FGD participants also recognized a continuing need for innovation (e.g., sustainable agricultural technologies). Climate justice is dynamic and necessitates continuous learning, responsiveness and cooperation. The integration of scientific knowledge, grassroots insights and collaborative institutionalism produces responsive and effective climate programs.

Conclusion

This study highlights the lived experiences and policy aspirations of farming communities in the Roxas Mountain Range, Koronadal City, as they confront the multifaceted impacts of climate change. Through surveys and focus group discussions, it becomes evident that farmers are not only aware of climate risks but are also actively engaged in seeking just and context-specific solutions.

Seven (7) key policy dimensions emerged from the community's responses: (1) increasing climate-resilient agricultural support; (2) strengthening disaster risk reduction and adaptation strategies; (3) enhancing access to financial and technical assistance; (4) promoting inclusive and participatory governance; (5) improving land use and resource management policies; (6) expanding climate education and awareness; and (7) supporting renewable energy and sustainable practices. These dimensions form the backbone of community-driven climate justice pathways, where farmers emphasized the importance of local participation, sustainable farming systems, inter-agency collaboration and institutional accountability.

A significant finding is that all respondents reported being consulted in climate-related projects, while a strong majority (88.89%) affirmed that current climate policies consider principles of equity and fairness. These responses point to a promising culture of civic engagement and participatory governance. However, persistent gaps remain—particularly in the consistent implementation of policies, scalability of support programs, and the tailoring of interventions to local ecological, cultural and socio-economic contexts.

The study provides actionable insights that can directly influence LGU planning and budgeting. These include prioritizing investments in early warning systems, climate-resilient agricultural inputs, climate education programs and participatory planning mechanisms. Strengthening these areas can help ensure that the most vulnerable farming communities are equipped to cope with and adapt to increasing climate risks. The findings also emphasize the need for stronger alignment between grassroots realities and overarching policy frameworks. LGUs are urged to institutionalize climate justice principles within agricultural, environmental and disaster risk governance, through legislation that

guarantees farmers' participation in policymaking and ensures inclusive and transparent implementation of adaptation measures.

Ultimately, the results underscore the importance of community empowerment as a cornerstone for effective local adaptation strategies. Climate justice cannot be achieved solely through top-down interventions. Instead, it requires recognizing farmers as active co-creators of solutions, bridging local knowledge with scientific approaches and fostering multi-level partnerships across sectors.

This study offers both empirical evidence and practical policy directions that can inform a more just, inclusive and responsive climate agenda in the Philippines. The experience of farming communities in Koronadal City affirms a critical lesson: that resilience must be grounded in justice, and that meaningful climate action must originate from the voices, values and leadership of those most affected.

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CHAPTER 6

Corruption and the Realization of the Right to a Healthy Environment in ASEAN: Exploring the Connection

Ratna Juwita, Ph.D.[16]*

Abstract

Corruption and the right to a healthy environment are two deeply interconnected issues. The success of climate change adaptation and mitigation depends not only on effective governance but also on the realization of the right to a healthy environment. Corruption stands as a major obstacle to these efforts. As a region rich in natural resources, ASEAN plays a vital role in ensuring the success of global climate action. This research explores the nexus between corruption and the realization of the right to a healthy environment in ASEAN, with Indonesia as the case study. Through the analysis of four environmental corruption cases, this research demonstrates how corruption enables the illegal transformation of natural forests into palm oil plantations and facilitates illegal mining. The consequences are devastating, ranging from the extinction of wildlife to the degradation of soil and water. Local and indigenous communities suffer the most, losing essential sources of food and income. This research argues that ASEAN must take stronger action to identify and address environmental corruption as a critical step toward realizing the right to a healthy environment.

Keywords: environmental corruption, right to a healthy environment, illegal mining, deforestation, climate change, ASEAN.

[16] Visiting Research Fellow, Department of Transboundary Legal Studies, Faculty of Law, University of Groningen. Assistant Professor, Department of International Law, Faculty of Law, Universitas Atma Jaya Yogyakarta. Email addresses: r.juwita@rug.nl and ratna.juwita@uajy.ac.id

1. Introduction

Corruption kills wild animals, burns forests, and contaminates water with dangerous substances (UNODC 2023b, p. xiii; Koyuncu and Yilmaz 2009). Despite years of anti-corruption efforts, combating corruption remains a major challenge. In Indonesia, the 2024 murder of Adjunct Commissioner Ryanto Ulil Ahsar by his colleague Dadang Iskandar shocked the nation (Neski 2024). The cold-blooded killing was reportedly motivated by Ulil's law enforcement efforts against illegal mining. According to police investigations, Iskandar had a history of protecting companies engaged in illegal mining in South Solok.

Another notable case is the conviction of Harvey Moeis and his accomplices for corruption related to illegal tin mining and trading in Bangka Belitung (Martiar 2025; CAN 2024; Birtles 2024). Prosecutors claim the state suffered losses of Rp 300 trillion (approximately USD 18 billion). In a separate case in 2023, the Supreme Court sentenced businessman Surya Darmadi for corruption in the forestry sector which caused state losses amounting to USD 9 billion (Lestari 2024). These two mega corruption cases, along with Ulil's murder, demonstrate the devastating impact of environmental corruption on human rights.

In 2021, the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) emphasized the urgent need for stronger action to prevent the rise in global temperatures (UN Climate Change 2021). This decision reflects the growing international concern about the adverse impacts of climate change and the need to develop both adaptation and mitigation strategies. Earlier, in 2018, the Inter-American Court of Human Rights, in Advisory Opinion No. 23 on Human Rights and the Environment, recognized the interrelationship between human rights and environmental protection and addressed the consequences of environmental degradation on the right to a healthy environment (Inter-American Court of Human Rights 2017).

Following this global trend, the Association of Southeast Asian Nations (ASEAN) began drafting the ASEAN Declaration on the Environment in 2022. The right to a healthy environment is increasingly relevant in the context of climate change, especially in shaping effective adaptation and mitigation policies.

The right to a healthy environment is recognized as part of economic, social, and cultural rights under Article 12 of the International Covenant on Economic, Social and Cultural Rights (United Nations General Assembly 1966). This right was further clarified and affirmed in United Nations General Assembly Resolution 76/300, which emphasized the right to a clean, healthy, and sustainable environment and highlighted its indivisibility and interdependence with other human rights (United Nations 2022).

The right to a healthy environment continues to evolve alongside the legal corpus of climate change. The 28th Conference of the Parties (COP28) review of the Paris Agreement, one of the most recent international forums addressing global mitigation and adaptation efforts, played a pivotal role in advancing the content and implementation of this right (United Nations Climate Change 2023). The development of international

law has also been reinforced by strategic climate change litigation in several countries. In 2019 in the Netherlands, the Supreme Court upheld a landmark decision requiring the State to reduce greenhouse gas emissions by at least 25 percent by 2020. The ruling was grounded in the State's obligation to protect the rights to life and to private and family life of its residents as guaranteed under human rights law (Hoge Raad der Nederlanden 2019).

This research aims to bridge the trajectories of human rights and anti-corruption by analyzing the connection between corruption and the realization of the right to a healthy environment in ASEAN. Corruption in the environmental sector has devastating impacts on communities and ecosystems. In 2021, the United Nations General Assembly adopted a political declaration reaffirming Member States' commitment to addressing corruption challenges, implementing preventive measures, combating corruption, and strengthening international cooperation (United Nations General Assembly 2021).

The Sustainable Development Goals (SDGs), particularly Goal 16, rely on global efforts to mainstream transparency and anti-corruption as cross-cutting enablers for the broader development agenda (Reid 2020). Corruption diverts critical resources that should be used to fulfill the right to a healthy environment.

ASEAN participates in the global fight against corruption through the ratification of the United Nations Convention against Transnational Organized Crime and the United Nations Convention against Corruption (United Nations 2000; United Nations 2003). The region has also demonstrated a collective commitment to protecting the environment from the adverse impacts of climate change. This is reflected in the ratification of the Paris Agreement and ASEAN's regular participation in the Conferences of the Parties under the UNFCCC.

ASEAN's obligation to protect the environment is further reinforced in Article 1(9) of the ASEAN Charter (ASEAN 2007) as well as Articles 28(f), 35, and 36 of the ASEAN Human Rights Declaration (ASEAN 2012). In 2021, ASEAN released its Joint Statement on Climate Change acknowledging the harmful impacts of climate change on essential human needs such as food, water, and health.

Section 2 discusses the importance of climate finance and how corruption poses a threat to effective climate change financing. Section 3 describes the constitutional foundations of the right to a healthy environment in ASEAN. Section 4 addresses anti-corruption laws and the Corruption Perceptions Index (CPI) of ASEAN member states. Section 5 analyses the Concluding Observations of international human rights institutions regarding corruption and the right to a healthy environment in ASEAN member states. Section 6 presents a case study from Indonesia to illustrate environmental corruption in practice. Finally, Section 7 concludes the research by emphasizing the deep interconnection between anti-corruption efforts and the realization of the right to a healthy environment and advocates the formulation of integrated laws and policies linking these two trajectories.

2. Financing Climate Action in ASEAN: The Threat of Corruption in the Environmental Sector

2.1. Climate Finance in ASEAN

The availability and accessibility of adequate funding are crucial to achieving climate action. It is estimated that developing countries will require around USD 6 trillion to meet their climate goals. However, current global efforts have mobilized just over USD 100 billion annually in climate finance for these countries (United Nations Climate Change 2024; Alayza and Larsen 2025). This stark gap highlights the urgent need to strengthen efforts to mobilize and safeguard climate finance.

Under the United Nations Framework Convention on Climate Change (UNFCCC), climate finance refers to the financial resources mobilized and provided to support actions that mitigate, adapt to, and address the impacts of climate change (Watson et al. 2025). Such finance must be mobilized and allocated in line with the principle of common but differentiated responsibilities and respective capabilities, as enshrined in Article 3(1) of the UNFCCC and Article 2(2) of the Paris Agreement (United Nations 1992; Paris Agreement 2015).

In ASEAN, climate finance remains a critical challenge. Although it is one of the regions most vulnerable to climate change, ASEAN has not yet received the full amount of the promised climate funding. This issue is further complicated by estimates showing that climate change caused approximately USD 97.3 billion in economic losses in the region between 2009 and 2022. ASEAN continues to urge developed countries to fulfill their commitment to provide USD 100 billion annually to support mitigation and adaptation measures (ASEAN 2024).

In response, ASEAN has introduced several initiatives such as promoting sustainable forest management and enhancing cooperation across sectors in the areas of sustainable finance and disaster management (Alyaza and Larsen 2025; UNFCCC Secretariat 2024). However, the scale of planned programs and the current funding shortfall raise serious concerns.

In addition to the lack of funding, efforts to mitigate and adapt to climate change also face another serious challenge: corruption.

2.2 Devastating Impacts of Corruption in Environmental Sector

Corruption in the environmental sector takes many forms, ranging from illegal mining to wildlife trafficking. Corrupt actors often bribe public officials and professional licensing boards to obtain permits and licenses that undermine wildlife protection and violate environmental regulations. These officials may also engage in money laundering to conceal the origins of bribes, enriching themselves at the expense of ecological sustainability (UNODC 2023a).

Thompson argues that corruption acts as a facilitator of environmental crime and identifies four stages where corruption and environmental crime converge: acquiring access, extraction, transport, and consumption or disposal (Thompson 2023). This framework illustrates how corruption risks are present throughout the entire business operation in the environmental sector.

Hwang et al. show that corruption contributes to increased CO_2 emissions while also indirectly reducing emissions by hindering economic growth. However, their overall conclusion is that higher levels of corruption correlate with poorer environmental quality (Hwang et al. 2023). In contrast, Asif et al. (2023) find that corruption has a positive and significant long-term impact on both carbon and ecological footprints.

The United Nations Office on Drugs and Crime (UNODC) has also highlighted that the links between illegal wildlife trade, biodiversity loss, and climate change remain under-researched and poorly understood (UNODC 2022). Therefore, policymakers must integrate these three issues into policy frameworks to ensure a more comprehensive approach.

Regarding the devastating impact of corruption on forests, UNODC argues that the severity of the impact depends on the type of forest affected. In particular, the consequences of corruption in primary forests differ significantly from those in plantation forests. According to UNODC, the damage to primary forests can be irreversible due to the destruction or degradation of their natural ecological systems (UNODC 2023b).

Wang et al. (2024) argue that reducing corruption can significantly lower CO_2 emissions resulting from income inequality. Their study finds that corruption contributes to rising income inequality, which in turn may lead to increased CO_2 emissions. Environmental corruption is therefore one of the key drivers of environmental degradation, with devastating consequences for the right to a healthy environment.

3. The Right to A Healthy Environment in ASEAN: Constitutional Foundations

The ultimate guarantee of the right to a healthy environment lies in a country's constitution. This section examines whether the constitutions of ASEAN Member States explicitly recognize this right.

Surprisingly, not all ASEAN Member States include clear provisions on the right to a healthy environment in their constitutions. However, countries such as Indonesia, the Philippines, and Vietnam do recognize this right.

In Indonesia, Article 28H (1) of the Constitution affirms that every person has the right to live in physical and spiritual prosperity, to have a home, and to enjoy a good and healthy environment, as well as the right to receive medical care (Indonesia 2000). This provision is often interpreted as a constitutional guarantee of the right to health.

Similarly, Article 43 of Vietnam's Constitution states that everyone has the right to live in a clean environment and the duty to protect it (Socialist Republic of Vietnam 2013).

Although the Constitution of Cambodia (Kingdom of Cambodia 1999) does not explicitly recognize the right to a healthy environment, it assigns responsibility for environmental protection to the government. Article 59 stipulates that the Government of Cambodia has a duty to protect the environment.

Thailand's Constitution contains a similar provision regarding environmental protection, but unlike Cambodia, it places this duty on the people. While the Constitution of Thailand does not expressly guarantee the right to a healthy environment, Section 50(8) states that citizens have a duty to cooperate in conserving and protecting the environment, natural resources, biodiversity, and cultural heritage (Constitution of Thailand 2017).

The Constitution of the Philippines also does not explicitly mention the right to a healthy environment. However, Article II Section 16 declares that the State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature (Government of the Republic of the Philippines 1987).

The constitutions of Brunei Darussalam, Singapore, and Myanmar do not recognize the right to a healthy environment. Similarly, the Constitution of Lao PDR does not explicitly guarantee this right. However, Article 25 affirms the State's responsibility to improve and expand public health services, thereby supporting the right to health (Lao People's Democratic Republic 1991).

Although the Malaysian Constitution lacks an explicit provision on the right to a healthy environment, state practice indicates that this right is interpreted as part of the broader constitutional guarantee of the right to life and people's health (Tan Tek Seng v. Suruhanjaya Perkhidmatan Pendidikan).

Constitutional protection of the right to a healthy environment in ASEAN can therefore be considered uneven. While some ASEAN Member States explicitly recognize this right in their constitutions, others incorporate it indirectly within the framework of other constitutionally protected human rights, particularly the right to life.

4. Corruption and the Right to a Healthy Environment in ASEAN: A Review of Corruption Perception Index Rankings and Concluding Observations of the Committee on Economic, Social and Cultural Rights and the Committee on the Rights of the Child

4.1. CPI Comparison among ASEAN Member States

This sub-section analyses the Corruption Perception Index (CPI) rankings of ASEAN Member States. Examining these rankings helps assess the effectiveness of a country's general anti-corruption mechanisms. The CPI is designed to measure perceptions of corruption in a country. Although it does not reflect the exact level of corruption, it provides an estimate of how well anti-corruption mechanisms are functioning (Transparency International 2025; Søreide 2006).

ASEAN Member States	CPI Year	CPI Rank
Brunei Darussalam[17]	-	-
Cambodia	2024	158
Indonesia	2024	99
Lao PDR	2024	114
Malaysia	2024	57
Philippines	2024	114
Singapore	2024	3
Thailand	2024	107
Vietnam	2024	88
Myanmar	2024	168

Table 1. CPI Comparison ASEAN Member States in 2024.

Table 1 shows a significant difference in CPI rankings among ASEAN Member States. In 2023, Singapore achieved the highest ranking at third place, while Myanmar ranked the lowest at 168th. Lao PDR and the Philippines shared the same ranking, although the Philippines' score declined from 34 in 2023 to 33, whereas Lao PDR's score increased from 28 to 33 (Transparency International 2025). Overall, ASEAN Member States have diverse characteristics, circumstances, and anti-corruption mechanisms, which contribute to the wide variation in their CPI rankings.

Unfortunately, Transparency International does not provide a specific CPI ranking for different governance sectors, such as the perception of corruption in the environmental sector. Therefore, to gain deeper insights into environmental corruption, this research utilizes data from the Concluding Observations (COs) on ASEAN Member States issued by the Committee on Economic, Social and Cultural Rights (Comm ESCR) in the next sub-section.

4.2. Corruption and the Right to a Healthy Environment: How the Committee on Economic, Social, and Cultural Rights and the Committee on the Rights of the Child Connect the Issues in ASEAN Member States

Concluding Observations (COs) issued by international human rights institutions are key catalysts in the development of international human rights law. Despite their soft normative force, they possess the power to influence and shape state behavior. COs also serve as authoritative interpretations that further elaborate the scope and content of human rights.

[17] There is currently no National Chapter of Transparency International in Brunei Darussalam, therefore no CPI has been calculated for Brunei since 2020. See Transparency International, 2025b.

This sub-section analyses the COs on ASEAN Member States issued by the Committee on Economic, Social and Cultural Rights (Comm ESCR) and the Committee on the Rights of the Child (Comm CRC) to understand how these Committees conceptualize the link between corruption and the right to a healthy environment.

The Comm ESCR in 2014 raised concerns about corruption in its CO on Indonesia's initial report to the Committee (United Nations Economic and Social Council 2014). The Committee expressed alarm over the pervasive corruption at all levels of the State party's administration, emphasizing that it had led to human rights violations in several sectors, including the extractive industry.

This concern was raised alongside two related issues stemming from systemic corruption: the reduction of resources available for the realization of economic, social, and cultural rights, and the obstruction of redress for victims. The Comm ESCR urged Indonesia to intensify its efforts to combat corruption and to raise public awareness about the economic and social costs associated with it.

The Committee also dedicated specific paragraphs to the mining and plantation sectors, expressing concern over human rights violations in these areas. It recommended that Indonesia review its legislation, regulations, and practices in these sectors to ensure compliance with international human rights standards.

The Comm ESCR raised similar concerns regarding corruption in its CO on the Philippines. As the CO on the Philippines is more recent, the Committee provided more detailed recommendations, including references to specific laws forming the basis of the country's anti-corruption mechanisms. The Comm ESCR welcomed the adoption of Presidential Executive Order No. 2 of 2016 on the right to information, the Sandiganbayan Reform Act of 2015, and the role of the Office of the Ombudsman in enforcing anti-graft and corrupt practices laws (United Nations Economic and Social Council 2016).

Meanwhile, although the Comm CRC did not explicitly mention corruption in its CO on the Philippines, it addressed environmental health concerns, particularly air and water pollution and their serious consequences for children's health and development (United Nations Committee on the Rights of the Child 2005).

The Comm ESCR also addressed corruption in a specific paragraph of its CO on Thailand, emphasizing that Thailand must ensure protection for victims of violations of economic, social, and cultural rights caused by corruption. However, the Committee did not elaborate on the specific types of corruption that would qualify as such violations.

Although the Comm ESCR did not explicitly refer to the right to a healthy environment, it touched on related issues such as pollution and healthcare. The Committee expressed concern over shortcomings in the effective implementation of regulations on environmental quality and industrial activity (United Nations Economic and Social Council 2015).

The CO of the Comm CRC on Lao PDR did not mention corruption or the right to a healthy environment explicitly. However, it addressed environmental health by recommending that Lao PDR take necessary measures to ensure children's access to safe drinking water, curb deforestation, and restrict dam construction based on a child-rights impact assessment (United Nations Committee on the Rights of the Child 2018).

The Committee also encouraged involving children in discussions on these matters. While the Comm CRC did not explicitly use the term "right to a healthy environment," it emphasized the importance of environmental protection, particularly curbing deforestation, as essential to upholding children's rights.

The Comm CRC did not mention corruption or the right to a healthy environment in its COs on Brunei Darussalam, Malaysia, and Singapore (United Nations Committee on the Rights of the Child 2012; 2016; 2019). In a broader overview, four COs issued by the Comm ESCR - those concerning Thailand, the Philippines, and Indonesia — addressed corruption. The Comm CRC referred to corruption only in its CO on Myanmar.

Among these, the most detailed discussion of corruption appears in the Comm ESCR CO on Indonesia. A comparison between the COs of the Comm ESCR and the Comm CRC reveals the need for a more coherent and consistent approach. Both Committees should strive to provide more detailed and actionable recommendations, enabling States to implement and periodically assess progress.

Given the Committees' authority and the influential role of COs, they should place greater emphasis on the link between corruption and the impediment it poses to the realization of the right to a healthy environment. The COs collectively reveal a missed opportunity for both the Comm ESCR and the Comm CRC to offer clear and concrete guidance to ASEAN Member States on how combating corruption can support the realization of the right to a healthy environment.

5. Environmental Corruption in Practice: Illegal Mining and Logging in Indonesia

This section presents concrete cases of environmental sector corruption in the mining and forestry industries in Indonesia. It highlights four cases: two involving the mining sector and two involving the forestry sector. The mining cases are the dispute between Churchill Mining PLC and Planet Mining Pty Ltd v. Indonesia at the International Centre for Settlement of Investment Disputes (ICSID), and the case of Harvey Moeis and PT Timah Tbk. The forestry cases include the case involving Akil Mochtar, Hambit Bintih, and Cornelis Nalau Atun, and the case of Surya Darmadi.

The case of Churchill Mining and Planet Mining v. Indonesia drew national attention when it was revealed that the mining licenses held by Churchill Mining were obtained through corrupt and fraudulent conduct (Taylor 2011; Office of Assistant to Deputy Cabinet Secretary for State Documents & Translation of Indonesia 2024; Yasmin 2019). Churchill Mining brought the case to ICSID in 2012 (International Centre for Settlement of Investment Disputes 2016). ICSID ruled that investments acquired

through corruption, fraud, or deceitful practices are not entitled to protection under international investment law (International Centre for Settlement of Investment Disputes 2016). The tribunal also emphasized that companies must exercise due diligence when operating extraterritorially, as the risk of corruption during business activities is foreseeable (International Centre for Settlement of Investment Disputes 2016). Although the primary issue in this case was document forgery rather than direct environmental harm caused by mining operations, it illustrates how corruption can undermine corporate investments when companies fail to properly vet their local business partners, in this instance, the Ridlatama Group. Furthermore, the case highlights the ease with which corruption can occur during the process of acquiring mining permits in Indonesia.

The second case involves Harvey Moeis and PT Timah Tbk and concerns corruption in the governance of tin mining in Bangka Belitung (District Court of Central Jakarta 2024). Mochtar Riza Pahlevi Tabrani, who served as Director of PT Timah Tbk from 2016 to 2021, collaborated with Harvey Moeis and the owners of private tin smelters by establishing a corrupt partnership. Under this scheme, PT Timah Tbk received tin ore from private smelters that sourced it through illegal mining activities conducted within the licensed areas of other private companies. Harvey Moeis was also convicted of money laundering along with Helena Lim (District Court of Central Jakarta 2024). He disguised payments ranging from $500 to $750 per metric ton from private smelters as corporate social responsibility (CSR) contributions, when in fact the funds were used for personal expenditures, among other things (District Court of Central Jakarta 2024).

This case reflects deeper structural problems in the tin mining sector, including PT Timah Tbk's inability to meet production targets and the greed of both its directors and private smelter owners. Rather than reforming mechanisms to increase legitimate production or engaging in fair competition, the parties chose to collude and disregard existing laws and policies. Environmental concerns were treated as a distant priority, further exacerbating the damage caused by corrupt practices in the sector.

An environmental expert testified in court that laboratory tests and soil analyses confirmed significant soil degradation at the mining sites (District Court of Central Jakarta 2024). The estimated value of the soil and environmental damage was approximately Rp 271,069,688,018,700 ($16,130,011,842.62) (District Court of Central Jakarta 2024). The expert attributed this degradation to illegal tin mining activities (District Court of Central Jakarta 2024). One of the most alarming consequences of such activities is that the cost of environmental restoration must be borne by the State, and the recovery process will take a considerable amount of time (District Court of Central Jakarta 2024). The expert further noted that in some cases in developed countries, ecosystem recovery can take hundreds of years and involves extremely high costs (Another environmental expert testimony cited in District Court of Central Jakarta 2024). In this case, the total financial loss to the State was estimated at Rp 300,003,263,938,131.14 ($17,851,705,351.18) (District Court of Central Jakarta 2023).

The following case involves the bribery of the Head of the Constitutional Court, which is linked to deforestation in Gunung Mas district, Borneo. Under Law Number 23 of 2014 on Regional Government, the Regent/Bupati has the authority to adopt local regulations and manage governance within their jurisdiction. In the forestry sector, Regents have the power to lease land to developers as they see fit. However, when the checks and balances system fails, this centralized authority can lead to abuse of power.

In 2013, the UNODC reported that Hambit Bintih, the Regent of Gunung Mas (2008–2013), granted licenses to five companies chosen by his campaign treasurer (UNODC 2023). Bintih later sold these companies to a Malaysian palm oil firm for $9.2 million. A portion of this payment was used to bribe Akil Mochtar, the Head of the Constitutional Court at the time, to influence the election in Bintih's favor. During his tenure, Bintih was notorious for granting forest licenses and permits, contributing to significant deforestation and environmental damage (The Gecko Project, Earthsight & Mongabay 2017). Had Bintih been re-elected through this bribery scheme, the ecosystem and indigenous communities in Gunung Mas would have continued to suffer from soil degradation and land loss.

The final case involves Surya Darmadi, a palm oil tycoon convicted of corruption in 2023 (District Court of Central Jakarta 2023; Transparency International 2023; Jong 2023; Llewellyn 2023). Darmadi conspired with Raja Thamsir Rachman, the Regent of Indragiri Hulu, Riau (1999–2004 and 2005–2008), to illegally convert over 36,000 hectares of protected forest into palm oil plantations (District Court of Central Jakarta 2023). In 2014, Darmadi also bribed Annas Maamun, the Governor of Riau (February 2014 to September 2014), to facilitate the conversion of over 18,000 hectares of protected forest for his company, PT Duta Palma Group (Supreme Court of Indonesia 2016). Darmadi was convicted of corruption and money laundering and sentenced to 15 years of imprisonment (District Court of Central Jakarta 2023).

The judges concluded that Darmadi's companies, namely PT Banyu Bening Utama, PT Panca Agro Lestari, PT Kencana Amal Tani, PT Palma Satu, and PT Seberida Subur, had caused irreversible physical changes to the forest area, transforming it into palm oil plantations, with no remaining natural forest trees. Several witnesses testified that in 2003, before the companies began operations, local communities were still able to utilize the forest for resources like wood, rattan, and resin, and fish from the river. However, after the companies started operations, these resources became inaccessible to the local communities. Witnesses also testified that until around 2022, wild animals such as Sumatran tigers, bears, pangolins, porcupines, elephants, and other wild birds were commonly seen, but these animals disappeared after the companies converted the forests into palm oil plantations. One witness even testified that during the land clearing in 1997, PT Kencana Amal Tani killed twelve elephants and was fined Rp 14 billion by the District Court of Indragiri Hulu. These testimonies demonstrate how corruption indirectly leads to environmental destruction and the killing of wildlife.

The fact that the Chief of the Constitutional Court, Akil Mochtar, received a significant bribe reveals that corruption in Indonesia is systemic, structural, and widespread. It does not end with the initial administrative process of obtaining licenses and

permits, but extends to the law enforcement and judicial systems. Corruption in extractive industries, such as mining and forestry, can infiltrate the judiciary, as seen when Hambit Bintih sought to win re-election and maintain power as the Regent of Gunung Mas. Corrupt companies also relied on support from the Regent to protect their business interests. This cycle of corruption would have continued unchecked if law enforcement had failed to investigate and arrest Mochtar. It would have been deeply unfortunate for the people of Gunung Mas, who had hoped to stop deforestation by electing a new Regent, if Hambit and Mochtar had not been stopped by the authorities.

Governors, regents, the Chief Justice, and private sector actors, all subjects in the cases above, face significant temptation to engage in corruption due to the authority vested in their positions, compounded by the high cost of being elected or re-elected. Indonesia is notorious for its costly political landscape. Aspinall and Berenschot argue that a striking feature of Indonesia's democracy is that its winners are elites who derive power, prestige, and wealth through political engagement (Aspinall and Berenschot 2019). One interviewee stated, "An income of 3 million rupiah [about USD 265 per month] is not enough to cover the costs [of an election campaign]." Supporting this, the Cost of Politics project by the Westminster Foundation for Democracy found that in the 2024 elections, candidates spent an average of Rp5 billion (approximately $315,000), nearly eight times the annual salary of a legislator (Cost of Politics 2025). This is exemplified by Hambit Bintih's attempt to secure re-election by selling forest land in Gunung Mas to palm oil companies and using the proceeds to bribe Akil Mochtar. A similar pattern occurred in the case of Surya Darmadi, who bribed Annas Maamun, Governor of Riau in 2014 (Kuipers and Warburton 2024). The high cost of politics is a major structural driver of corruption. Unless this underlying problem is addressed, it will be difficult to effectively combat corruption in any sector in Indonesia (Supreme Court of Indonesia 2016; Juwita 2023; Juwita 2023b).

The link between environmental corruption and the realization of the right to a healthy environment is demonstrated in the cases discussed. The transformation of natural forests into palm oil plantations not only kills wildlife but also gradually degrades soil and water quality. Local communities bear the heaviest burden of this transformation, as they lose not only sources of income but also access to food and clean water. In the mining sector, illegal operations can lead to serious accidents when mining sites are not managed according to safety and environmental standards. The testimonies of environmental experts in the corruption case of Harvey Moeis revealed that restoring damaged ecosystems will take years and require a significant amount of money (District Court of Central Jakarta 2024). For species that have been rendered extinct due to deforestation and habitat loss, no recovery is possible. This represents a great loss for both humanity and biodiversity.

These four cases enrich the understanding of the nexus between corruption in the environmental sector and the right to a healthy environment. Most ASEAN Member States have enshrined this right in their Constitutions. However, mere recognition is insufficient to protect the environment from corruption. As the Indonesian case studies illustrate, corrupt actors aggressively find and create opportunities, driven by complex underlying

motivations. One such motivation, as highlighted in the case studies, is the high cost of politics, which incentivizes corrupt behavior to finance political ambitions.

The Comm ESCR and the Comm RC should delve more deeply into specific cases to uncover patterns and risks associated with environmental corruption. Through in-depth studies and investigations, these bodies can contribute to preventing and combating corruption while strengthening the protection of the right to a healthy environment. sending a clear message that the connection between environmental corruption and the realization of the right to a healthy environment is both real and urgent.

6. Conclusion

Environmental corruption is one of the greatest threats to reversing the adverse impacts of climate change. Unfortunately, the literature on this topic remains limited, though it is gradually growing. Climate change mitigation and adaptation are responsibilities shared by all States, each facing unique challenges based on their specific circumstances. ASEAN Member States have united to speak with one voice at the Conferences of the Parties (COPs) and have shown a collective commitment to climate action. Building on this spirit, this research highlights the need to strengthen the connection between anti-corruption and human rights, particularly the right to a healthy environment. The normative outputs of international human rights institutions have not yet fully articulated the nexus between environmental corruption and this right. However, such outputs can serve as important catalysts for raising awareness and deepening understanding. Therefore, it is essential to formulate concrete, precise, and concise COs that explicitly address the link between environmental corruption and the right to a healthy environment.

ASEAN Member States, particularly Indonesia, must take action to establish a clear connection between environmental corruption and the right to a healthy environment by fostering research and advocacy on these issues. It is recommended that ASEAN, through the Working Group on Climate Change, initiate case studies on environmental corruption across its Member States. The data gathered from these studies will be pivotal in providing an overview of corruption in the environmental sector. Moreover, this data can be processed to develop a typology of environmental corruption, which is essential for identifying patterns and designing solutions tailored to address them. Lastly, a strong political will to protect both the environment and institutional integrity must be enhanced. With such commitment, ASEAN can tackle two pressing issues simultaneously, protecting the environment and combating corruption, thereby helping to reverse the adverse impacts of climate change.

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CHAPTER 7

Unheard Local Champion: Indigenous Women and Ancestral Land Protection Against Lower Sesan II Hydropower Dam

Bunly Seoung, Svay Rieng University

Abstract

The Lower Sesan II hydropower dam, the largest hydropower project in Cambodia, is a 400 MW reservoir project financed by the China Huaneng Group, the Royal Group of Cambodia, and Electricity Vietnam (Hensengerth 2017b). Construction began in 2014 in Stung Treng Province in northeastern Cambodia, and operations officially commenced in December 2018 (Business & Human Rights Resource Centre 2021). The reservoir flooded approximately 34,000 hectares of forest and ancestral land, including around 7,000 hectares of farmland, forcing the displacement of nearly 5,000 people, most of whom belong to Indigenous Bunong and other ethnic minority communities (Carlo 2024; Forsyth 2017). In addition, the dam blocked migratory fish routes along the Sesan and Srepok rivers, disrupting fisheries relied upon by an estimated 78,000 people downstream (Forsyth 2017).

For the Bunong people, ancestral lands and forests are inseparable from their cultural identity, spirituality, and livelihoods. These landscapes serve as sites for rituals, traditional medicine gathering, burial grounds, and subsistence farming practices (Mahanty, Chann, and Suong 2023). However, the dam development process has been widely criticized for failing to meet the principle of free, prior, and informed consent (FPIC), with very limited meaningful consultation conducted with affected Indigenous communities (Bunly Soeung 2022a). Compensation arrangements were also widely considered inadequate. Many displaced households were offered cash payments or relocation houses on infertile land, while the cultural, social, and environmental losses suffered by communities remained largely unaddressed (Hul 2017; Bunly Soeung 2022b).

Methodology

The discussion and analysis of this chapter are primarily based on both primary and secondary data that are critically inseparable. A thorough desk review was conducted to collect secondary data from books, news reports, scholarly journals, and policy papers from internet-based websites, while primary data was gathered from 2023 to 2025 through online

and in-person semi-structured interviews with affected community residents, prominent environmental activists, representatives of Indigenous community-based organizations, independent academics and the local authorities.

1. Lower Sesan II Hydropower Dam

The Lower Sesan II hydropower dam, the biggest dam project in Cambodia, is a 400 MW reservoir project financed by the China Huaneng Group, the Royal Group of Cambodia, and Electricity Vietnam (Hensengerth 2017b). Construction started in 2014 in Stung Treng Province in northeast Cambodia, and operations officially began in December 2018 (Business & Human Rights Resource Centre 2021). The reservoir flooded approximately 34,000 hectares of forest and ancestral land, including around 7,000 hectares of farmland, forcing the relocation of nearly 5,000 people, most of whom belong to Indigenous Bunong and other ethnic minority communities (Carlo 2024; Forsyth 2017). The dam also blocked migratory routes along the Sesan and Srepok rivers, disrupting fisheries relied upon by an estimated 78,000 people downstream (Forsyth 2017; Hensengerth 2017a).

The Bunong regard their ancestral lands and forests as inseparable from their culture, spirituality, and way of life. These landscapes serve as sites for rituals, traditional medicine gathering, burial grounds, and subsistence livelihoods (Mahanty, Chann, and Suong 2023). However, the dam development process did not follow the principle of free, prior, and informed consent (FPIC), and affected communities experienced very limited meaningful consultation (Bunly Soeung 2022a). Compensation schemes were also widely criticized as inadequate, as displaced households were offered either cash compensation or relocation houses on infertile land, leaving many cultural, social, and environmental losses unresolved (Hul 2017; Bunly Soeung 2022b).

Timeline of Community-Led Resistance in Kbal Romeas (2013–2025)

2013–2014: Before the flood

As plans for the Lower Sesan II dam progressed, Bunong communities expected to be affected, including Kbal Romeas village, began raising serious concerns regarding the project. Indigenous leaders such as Dam Samnang and Choeun Sreymom warned about the destruction of ancestral burial grounds and community lands and requested consultations with authorities (Forsyth 2017; Bunly Soeung 2022a). Community members repeatedly rejected the proposed resettlement arrangements, which included relocation and compensation packages considered insufficient for sustaining their traditional livelihoods (Hul 2017).

Mid-2017: Reservoir filling

Between July and September 2017, the closure of the dam gates led to rapid flooding of surrounding villages. By mid-October, Srekor village was completely submerged,

while Kbal Romeas experienced flooding with water levels reaching approximately 1.3 meters (Carlo 2024; Hul 2017). Around 58 families in Kbal Romeas refused relocation and remained in partially flooded homes, using boats to move within the village.

Late 2017: Public defiance

Community resistance intensified as villagers began openly defying relocation pressure. Houses belonging to families who accepted relocation were marked with red paint, while houses belonging to families resisting relocation were marked in blue with slogans such as "No LS2 Dam" or "We will fight till we die." Community patrols also attempted to stop logging activities related to dam development, and both men and women participated in acts of resistance despite intimidation and pressure from authorities (Forsyth 2017; Bunly Soeung 2022b).

Early 2018: Formal petitions

In March 2018, community representatives, including leaders such as Dam Samnang, filed formal complaints with provincial authorities. Their demands included compensation for flooded rice fields at approximately USD 3,000 per hectare, recognition of community forest areas, and protection of ancestral land rights (Business & Human Rights Resource Centre 2021).

December 2018: Start of dam operations

Despite the official start of electricity generation in December 2018, resistance continued among affected communities. Approximately 146 families in Srekor and Kbal Romeas remained in the area despite rising water levels, refusing to leave their ancestral burial grounds and communal lands (Carlo 2024; Hul 2017).

2019–2021: Cultural claims and institutional efforts

Following the initial flooding, community leaders such as Srang Lanh, the deputy village chief of Kbal Romeas, began efforts to obtain collective land titles under Cambodia's communal land titling framework (Koem 2022). Community members carried out land mapping exercises and submitted petitions covering approximately 7,000 hectares of communal land, although the requested area was later reduced due to administrative pressure. During the same period, a Bunong Cultural Center was established to preserve cultural practices and strengthen community cohesion.

2022–2024: Persistent holdouts

By mid-2024, around 62 families continued living in higher areas of Kbal Romeas without formal relocation support. They continued to submit legal claims seeking

recognition of between 2,000 and 3,000 hectares of communal land and protection against encroachment by economic land concessions linked to private companies such as the Huayue Group (Bunly Soeung 2022b; Koem 2022). Community patrols also attempted to prevent logging and plantation expansion in remaining forest areas.

June 2025: Ongoing compensation claims

As of June 2025, holdout families continued filing petitions and organizing public advocacy activities, including campaigns marking World Environment Day to demand reparations for destroyed ancestral burial grounds and lost livelihoods. However, authorities indicated that compensation offers were no longer available (Business & Human Rights Resource Centre 2021).

The Indigenous rights movement in Cambodia

The Indigenous rights movement in Cambodia began gaining momentum in the late 1990s as rural and ethnic minority communities mobilized against land grabbing and large-scale economic land concessions granted to agro-industrial investors (Bunly Soeung 2022b). By the early 2000s, grassroots resistance movements increasingly collaborated with civil society organizations such as the NGO Forum on Cambodia, which helped coordinate advocacy for Indigenous land and forest rights at both local and national levels (Koem 2022).

The Indigenous Minorities' Rights (IMR) Project under the NGO Forum began working with community groups and non-governmental organizations addressing Indigenous issues between 2003 and 2004. This effort later led to the establishment of the Indigenous People NGO Network (IPNN) in September 2004. In 2005, another advocacy platform known as Indigenous Rights Active Members (IRAM) was formed to amplify Indigenous voices in national and international policy discussions, including participation in United Nations forums (Koem 2022).

In 2012, the Indigenous Peoples and Forestry Network (IPFN) was created through the merger of earlier networks such as the Forest Livelihoods and Plantations Network and the IPNN. Hosted by the NGO Forum on Cambodia, the IPFN became a major coordination platform for organizations working on communal land titling and forestry rights, facilitating policy dialogue, advocacy coordination, and capacity building (Koem 2022).

Through these networks, Indigenous leaders—including many women—developed strategies for securing communal land titles, promoting FPIC, and resisting encroachments by large-scale development projects. This networked advocacy structure has supported contemporary Indigenous-led mobilization across Cambodia, including resistance movements against hydropower projects such as the Lower Sesan II dam (Bunly Soeung 2022a).

Training in Kbal Romeas

Following the social, economic, and cultural impacts of the Lower Sesan II dam between 2013 and 2017, Bunong Indigenous women in Kbal Romeas emerged as key leaders in organizing peaceful resistance to the project. Many women refused relocation and demanded recognition of their land rights. At the local level, however, there were no formal institutions specifically addressing women's concerns in either Kbal Romeas Chas or Kbal Romeas Thmey.

In response, a local civil society organization known as the Cambodian Indigenous Women's Working Group (CIWWG) played an important role in supporting women's participation in community advocacy. The organization promoted women's participation in capacity-building activities, ensuring that at least 40 percent of participants in training programs were women. These programs focused on skills such as filing formal complaints, negotiating with provincial authorities, and conducting basic surveys to document community living conditions. Such capacity-building initiatives strengthened women's leadership roles in community resistance and collective action (Loek and Cambodia Indigenous Peoples' Organization 2021).

2. Legal Framework

Several national laws in Cambodia recognize the collective land rights of Indigenous communities. The 2001 Land Law provides that shifting cultivation and traditional fallow are valid bases for communal land titling (Arts. 23–25) (Koem 2022). Sub-Decree No. 83, also known as Sub-Decree 83/2009, further clarified the communal land registration process in 2009. The procedure involves three main steps: recognition of the Indigenous community by the Ministry of Rural Development, registration of the community as a legal entity through the Ministry of Interior, and land surveying and final titling by the Ministry of Land Management, Urban Planning and Construction (Koem 2022).

The 2003 Forestry Law (now partly integrated into the 2023 Environment and Natural Resources Code) also recognizes the rights of Indigenous communities to collect forest products for subsistence and traditional use (Schulte 2014). Similarly, the 2008 Protected Areas Law requires conservation policies to respect Indigenous cultural practices and allow access to traditional areas under certain conditions (Schulte 2014). In addition, Environmental Impact Assessment (EIA) regulations and the recently adopted Environmental Code require project developers to consider cultural heritage, ethnic minority communities, and gender impacts when assessing development projects (Schulte 2014; Suong 2023). These frameworks also increasingly refer to the principle of free, prior, and informed consent (FPIC), which aims to ensure that Indigenous communities are properly consulted before projects affecting their lands are implemented (Suong 2023). However, the 2023 Environment and Natural Resources Code does not explicitly refer to "Indigenous peoples," despite their recognition in earlier legal provisions (Suong 2023).

Although Cambodia's legal framework appears robust on paper, its implementation remains significantly limited. By 2024, only 43 out of approximately 455 Indigenous communities had successfully obtained communal land titles (Koem 2022). In many cases, the areas formally titled were significantly smaller than those traditionally claimed by communities. Experts have estimated that at the current pace, it could take close to a century to complete the communal land titling process nationwide (Koem 2022). The process is widely regarded as slow, technically complex, costly, and fragmented across multiple ministries, making it difficult for communities to successfully secure legal recognition of their lands.

At the same time, the expansion of Economic Land Concessions (ELCs), often granted to politically connected elites and large agribusiness investors, continues to encroach on Indigenous territories (Bunly Soeung 2022b). In practice, this creates tensions between formal legal protections and development policies that prioritize large-scale economic concessions, weakening the effectiveness of communal land titles.

The Environmental Impact Assessment system also remains weak. Limited public access to EIA and Initial Environmental Examination (IEE) reports, unclear consultation procedures, and insufficient communication in local languages continue to restrict meaningful public participation in development decision-making processes (Schulte 2014). Although the current draft EIA law includes provisions referencing FPIC, it lacks clear enforcement mechanisms, and project developers often fail to adequately address community concerns, particularly those raised by Indigenous women and ethnic minority groups (Suong 2023).

Furthermore, the new Environment and Natural Resources Code does not explicitly protect Indigenous peoples as a distinct category of rights holders. This omission raises concerns that Indigenous communities may face increased exclusion from land governance decisions and may even be subject to criminalization under protected-area regimes (Suong 2023).

In summary, while Cambodia's legal framework formally recognizes certain Indigenous land and cultural rights, significant gaps remain between legal recognition and practical implementation. Bureaucratic obstacles, political patronage, weak enforcement, and institutional fragmentation continue to make it extremely difficult for Indigenous communities to secure communal land tenure or ensure the effective application of FPIC, particularly for women and other marginalized groups.

3. Challenges Faced by Indigenous Women-Led Protests against the Lower Sesan II Dam in Kbal Romeas

The Lower Sesan II Hydropower Dam in northeastern Cambodia has had profound social and environmental impacts on Indigenous communities, particularly the Bunong people of Kbal Romeas in Stung Treng Province. The project displaced thousands of residents and flooded large areas of ancestral land traditionally used for farming, forest gathering, and spiritual practices (Forsyth 2017; Carlo 2024). At the same time, the dam

also sparked one of Cambodia's most visible grassroots resistance movements, in which Indigenous women played leading roles in defending their lands and cultural identity (Bunly Soeung 2022a; Loek and Cambodia Indigenous Peoples' Organization 2021). However, women involved in these movements have faced numerous challenges, including legal intimidation, institutional repression, cultural loss, and social isolation. Their struggle reflects not only their determination to protect their ancestral territories but also the structural violence and marginalization experienced by Indigenous communities affected by large-scale development projects (Mahanty, Chann, and Suong 2023).

The case of Choeun Sreymom, her mother Koeng Ban, and her brother Dam Samnang illustrates the criminalization faced by community leaders involved in anti-dam protests. In August 2017, they were charged with criminal offences after participating in peaceful protests opposing the Lower Sesan II dam (Bunly Soeung 2022b; Hul 2017). Following the protest, provincial prosecutors summoned them on charges of "incitement to commit crimes." Choeun Sreymom chose not to appear in court out of fear of arrest, which she believed would weaken the morale and unity of the community. The case demonstrates how legal mechanisms have been used as tools of intimidation against Indigenous activists. At the time of writing, the legal case against her remains unresolved (Bunly Soeung 2022b).

Authorities also used coercive institutional strategies to pressure holdout communities into relocation. One such measure involved closing the local school and dismissing teachers, effectively cutting off access to education for children in the village (Hul 2017). This decision placed additional burdens on families, particularly on women who were primarily responsible for childcare and household management. The closure of the school not only disrupted children's education but also functioned as a psychological strategy aimed at making life in the village increasingly difficult and encouraging families to accept relocation.

In addition to these pressures, authorities introduced measures of surveillance and isolation. Checkpoints were established to restrict access to Kbal Romeas, limiting the movement of villagers and preventing journalists, human rights organizations, and international observers from entering the area (Forsyth 2017; Bunly Soeung 2022b). These restrictions effectively reduced external monitoring and support for the community while allowing authorities greater control over the narrative surrounding the dam and the ongoing resistance.

For Bunong women, these pressures intensified already existing social and environmental challenges. The flooding of forests, burial grounds, and sacred areas disrupted livelihoods and spiritual practices closely tied to the land (Mahanty, Chann, and Suong 2023). Women, who traditionally depend on forest resources and fisheries for subsistence and income, lost critical sources of food and economic security. As environmental conditions deteriorated, women also assumed greater responsibilities within the household, caring for children and elderly family members under increasingly precarious circumstances.

The cultural impact of displacement has also been significant. The flooding of ancestral lands destroyed important spiritual sites and weakened the community's connection to traditional landscapes (Mahanty, Chann, and Suong 2023). Women, who have traditionally served as custodians of oral histories, rituals, and cultural knowledge, faced the difficult task of preserving these traditions despite the physical loss of sacred spaces. At the same time, Indigenous women were largely excluded from formal environmental decision-making processes, including national environmental impact assessments related to the dam project. The lack of meaningful consultation and the failure to implement genuine FPIC procedures further marginalized women and their communities from decisions affecting their ancestral lands (Schulte 2014; Suong 2023).

The challenges faced by protesters also extended beyond the village itself. Groups of Kbal Romeas residents travelled to Phnom Penh to petition government ministries and lawmakers in search of solutions to issues such as forced displacement, lack of access to public services, and damage to local infrastructure (Bunly Soeung 2022b). However, their appeals were frequently ignored, and in some cases authorities responded by increasing restrictions on mobility and surveillance of the community.

Criminalization remained a recurring strategy used to suppress dissent. In March 2017, seven Indigenous Lao villagers from nearby Srekor village were also charged after opposing forest clearing activities linked to the dam project (Hul 2017). Later that year, Choeun Sreymom and members of her family were again summoned to court. These legal actions illustrate how judicial mechanisms have been used to discourage community resistance and limit the ability of affected residents to seek accountability (Bunly Soeung 2022b).

Taken together, these events reflect broader patterns of systemic exclusion affecting Indigenous communities in Cambodia. Community members who travelled to the capital to advocate for their rights often encountered institutional barriers, media marginalization, and limited political support. At both local and national levels, legal intimidation, restricted access to information, and weak accountability mechanisms have made it difficult for Indigenous communities to obtain justice or influence development decisions affecting their territories (Koem 2022; Suong 2023).

Despite these challenges, the Indigenous women of Kbal Romeas have continued to play central roles in resisting displacement and defending their ancestral lands. Their activism has involved confronting legal threats, cultural loss, and political marginalization while sustaining community solidarity and cultural continuity. Their resistance represents not only a struggle to protect a village but also a broader effort to defend Indigenous knowledge systems, spiritual traditions, and relationships with the land that large-scale development projects often threaten to erase (Mahanty, Chann, and Suong 2023).

The experience of the women of Kbal Romeas demonstrates that resistance can also be a form of survival. In contexts where Indigenous voices are frequently marginalized in the name of economic development, their struggle highlights the importance of recognizing Indigenous leadership, protecting cultural rights, and ensuring that development processes respect the dignity and consent of affected communities.

4. Leading Roles of Indigenous Women

The Lower Sesan II Dam has created a vast reservoir that flooded ancestral burial grounds, destroyed sacred forests, and fundamentally altered the livelihoods and cultural landscape of Indigenous communities in northeastern Cambodia (Forsyth 2017; Mahanty, Chann, and Suong 2023). As the waters rose and ancestral lands were submerged, several Indigenous women emerged as prominent leaders defending their communities, culture, and land rights. Among them were Srang Lanh, the deputy village head of Kbal Romeas, and Choeun Sreymom, the head of the Cambodian Indigenous Women's Working Group (CIWWG). Their leadership illustrates the intersection of environmental protection, Indigenous rights advocacy, and women-led grassroots activism in Cambodia (Loek and Cambodia Indigenous Peoples' Organization 2021).

Srang Lanh: Protector of Land, Memory, and Culture

Srang Lanh's leadership is deeply rooted in lived experience and collective memory. Prior to the flooding caused by the reservoir, communities in Kbal Romeas relied heavily on river fisheries and forest resources for food security and cultural practices (Forsyth 2017; Mahanty, Chann, and Suong 2023). However, the dam dramatically altered these ecosystems, submerging ancestral lands and burial grounds that had long served as cultural and spiritual anchors for the Bunong people.

Reflecting on these losses, Srang Lanh reportedly stated "I go there a few times a year to let my son know I haven't forgotten him." While many villagers eventually accepted government compensation and relocated, Srang Lanh and approximately 52 Bunong families refused to leave their ancestral territories. Instead, they resettled on higher ground overlooking the flooded areas of their former village, maintaining proximity to their ancestral lands (Carlo 2024; Hul 2017). In doing so, they rebuilt homes, revived community life, and began pursuing communal land titling as a strategy to legally protect their remaining territories (Koem 2022).

Efforts to secure collective land titles became a key component of defending their cultural survival. However, these efforts faced numerous obstacles, including competing claims from agribusiness interests, bureaucratic delays, and government officials who argued that the affected lands would eventually be fully submerged by the reservoir (Koem 2022; Bunly Soeung 2022b).

Srang Lanh's leadership also took the form of everyday acts of resistance. She organized community patrols to protect sacred forests from illegal logging and land encroachment, helped map culturally significant sites, and encouraged the revival of rituals and land stewardship practices. These actions reinforced community solidarity while linking environmental protection to cultural preservation (Mahanty, Chann, and Suong 2023).

Choeun Sreymom: Strategic and Gendered Resistance

While Srang Lanh's leadership remained rooted in village-level activism, Choeun Sreymom expanded Indigenous women's advocacy to the national level. By 2018, women

from eight Cambodian provinces had begun organizing collectively to address land rights violations affecting Indigenous communities. This collaboration led to the establishment of the Cambodian Indigenous Women's Working Group (CIWWG), which later evolved into the Cambodia Indigenous Women Association (CIWA) in 2022 (Loek and Cambodia Indigenous Peoples' Organization 2021).

Under Choeun Sreymom's leadership, CIWWG brought together women from various Indigenous groups—including Bunong, Tampuan, Kreung, Brao, Lao, and Khmer Loeu—to advocate for land rights, cultural protection, and gender equality within Indigenous communities (Loek and Cambodia Indigenous Peoples' Organization 2021).

Their advocacy efforts gained international recognition. In 2020, CIWWG received the Leadership Award from the International Indigenous Women's Forum for its contributions to Indigenous women's mobilization and advocacy for land rights and cultural protection.

Choeun Sreymom played a central role in organizing protests against the Lower Sesan II dam, advocating for more humane resettlement policies, and promoting non-violent, gender-sensitive forms of resistance. Although these efforts did not ultimately stop the construction of the dam, they helped draw national and international attention to the rights of Indigenous communities affected by hydropower development (Bunly Soeung 2022a).

Authorities also attempted to intimidate activists. In 2017, provincial courts summoned Choeun Sreymom, along with her mother and brother, on charges of "incitement," a move widely interpreted as an attempt to silence community leaders opposing the dam (Bunly Soeung 2022b). However, these legal actions also drew wider public attention to the leadership roles played by Indigenous women in defending community rights.

Collective Resistance Amid Rupture

The Lower Sesan II project represents a profound rupture in the relationship between Indigenous communities and their ancestral territories. The dam forced thousands of people to relocate while simultaneously disrupting ecosystems, livelihoods, and cultural traditions tied to the land (Mahanty, Chann, and Suong 2023).

Community members frequently described displacement in deeply emotional terms, recalling submerged homes, sacred pagodas, and spirit forests lost beneath the reservoir. The flooding therefore represented not only a physical transformation of the landscape but also a profound disruption of cultural memory and spiritual relationships with the land (Mahanty, Chann, and Suong 2023).

In response, Srang Lanh focused on rebuilding cultural continuity at the community level through land stewardship and cultural revival. Meanwhile, Choeun Sreymom transformed localized resistance into broader advocacy networks connecting grassroots activism with national and international human rights discussions (Loek and Cambodia Indigenous Peoples' Organization 2021).

Humanity, Resilience, and Enduring Legacy

The experiences of Srang Lanh and Choeun Sreymom demonstrate the resilience and transformative leadership of Indigenous women confronting large-scale development projects. Srang Lanh embodied place-based resilience through efforts such as cultural mapping, communal land titling, and ritual preservation, ensuring that cultural traditions remained rooted in the land even after displacement (Koem 2022; Mahanty, Chann, and Suong 2023).

Meanwhile, Choeun Sreymom helped build a broader Indigenous women's movement that reshaped national conversations on environmental justice, cultural rights, and gender equality within Indigenous communities (Loek and Cambodia Indigenous Peoples' Organization 2021).

Together, their activism challenges dominant development narratives that treat economic progress as incompatible with Indigenous cultural survival. In Kbal Romeas, the flooded landscape is not merely a lost village but a living site of memory, resistance, and cultural continuity. The women of the community continue to act as both protectors and organizers, sustaining their cultural legacy even as their ancestral lands remain partially submerged.

As the Lower Sesan II dam reservoir expanded, Indigenous communities including the Bunong, Phnong, and Kuy peoples in Stung Treng Province developed diverse strategies of resistance rooted in cultural traditions and collective identity. Indigenous women played central roles in these efforts, combining spiritual practices, collective memory, and symbolic resistance as forms of community-based activism (Mahanty, Chann, and Suong 2023; Loek and Cambodia Indigenous Peoples' Organization 2021). Their leadership illustrates how cultural traditions and environmental defense became closely intertwined in local resistance to the dam project (Bunly Soeung 2022a).

1. Protest through Spiritual Ceremonies

On 28 February 2015, hundreds of villagers gathered near the Lower Sesan II dam construction site to conduct a spiritual ceremony intended to "curse" the developer. Participants prayed and made offerings to ancestral spirits, asking them to stop the dam construction and protect their lands and rivers (Forsyth 2017; Bunly Soeung 2022a). The ceremony represented more than a symbolic ritual. Rooted in Indigenous cosmology, it also served as a form of political protest challenging both state authority and corporate power.

Beginning in 2015, events such as the International Day of Action for Rivers became important moments for community mobilization. Phnong and Bunong women led rituals, traditional dances, and prayers calling on water spirits to protect their rivers and oppose the Lower Sesan II project (Dialogue Earth 2021; Mahanty, Chann, and Suong 2023). These ceremonies transformed cultural practices into public acts of resistance, demonstrating how Indigenous spiritual traditions could function as political expressions in environmental struggles.

2. Women as Protectors of Cultural Continuity

Among the Bunong and Phnong peoples, ancestral spirits are believed to inhabit forests, rivers, and burial grounds, forming an essential part of community well-being and spiritual life (Mahanty, Chann, and Suong 2023). Indigenous women traditionally play important roles as custodians of these spiritual practices. In the context of the dam conflict, women organized rituals at threatened sacred sites, documented traditional stories, and maintained ceremonial practices despite the flooding of ancestral territories (Loek and Cambodia Indigenous Peoples' Organization 2021).

By placing cultural and spiritual practices at the center of their resistance, Indigenous women reframed the struggle against the dam as not only a land rights issue but also a defense of cultural survival. Rituals, ceremonies, and oral traditions became ways of asserting identity and belonging in landscapes undergoing rapid transformation (Mahanty, Chann, and Suong 2023).

3. Leading the Way in Public Protest

Indigenous women also played visible roles in public demonstrations and community mobilization. They organized marches, participated in protests, and spoke publicly about the social and environmental impacts of the dam (Bunly Soeung 2022a). Their presence helped communicate that the survival of Kbal Romeas depended not only on economic resources but also on the preservation of cultural and spiritual relationships with the land.

In many cases, women's participation reshaped the public image of the resistance movement. Their leadership highlighted the gendered dimensions of environmental justice, demonstrating how women's experiences of displacement, livelihood loss, and cultural disruption were central to the community's struggle (Loek and Cambodia Indigenous Peoples' Organization 2021).

4. Symbolic Resistance

Beyond demonstrations and rituals, the community also used symbolic forms of protest to express dissent. In several villages, houses were marked with painted slogans such as "NO LS2," transforming everyday spaces into visible symbols of resistance (Forsyth 2017; Bunly Soeung 2022b). Colors also became markers of political stance within the community: blue signified resistance to relocation, while red indicated acceptance of compensation and relocation.

These visual expressions turned homes and public spaces into sites of political storytelling. The aesthetic dimension of protest—often led by women—helped communicate the community's refusal to accept displacement and highlighted the spatial dimensions of cultural erasure caused by the dam (Mahanty, Chann, and Suong 2023).

5. Cultural Anchors in Times of Displacement

As homes and sacred sites were flooded, Indigenous women became central figures in maintaining cultural continuity. They organized rituals at partially submerged pagodas, transmitted songs and oral histories to younger generations, and continued ceremonies at burial grounds even as water levels rose (Mahanty, Chann, and Suong 2023).

Through these acts of remembrance, women helped sustain a sense of collective identity despite physical displacement. Rituals and cultural practices maintained spiritual connections to ancestral territories, allowing the community to preserve cultural continuity even when the landscape itself had been dramatically altered.

In this way, ritual practices became intertwined with political resistance. By framing dam construction as an offense against ancestral spirits and sacred landscapes, villagers challenged the legitimacy of the project not only on environmental grounds but also on moral and spiritual ones (Bunly Soeung 2022a).

Indigenous women therefore acted both as cultural guardians and strategic organizers. Their leadership combined spiritual traditions, community mobilization, and symbolic protest to sustain the movement. These practices illustrate how cultural continuity and environmental resistance can reinforce one another in Indigenous struggles over land and development.

Impact of the Dam Project and Authorities on Each Other: Transition from Resistance to Response

From Quiet to Platforms for Negotiation

As community protests intensified, authorities were increasingly compelled to respond. One outcome was the establishment of the Committee for Solving the Impacts of the Lower Sesan II Dam, which created a formal platform for dialogue among affected communities, developers, and government agencies (NGO Forum on Cambodia 2017).

The March 2017 National Dialogue Forum on Conflict Resolution in Phnom Penh further brought attention to the issue. Representatives from government ministries, civil society organizations, journalists, and affected communities—including women from Kbal Romeas—participated in discussions concerning compensation and resettlement policies (NGO Forum on Cambodia 2017). These platforms emerged largely as a response to sustained grassroots mobilization.

Changing the Design of the Dam

Although the core structure of the dam remained unchanged, authorities approved certain technical adjustments described as "design optimization." These modifications aimed to improve sediment flushing and water release mechanisms during flood periods. Environmental observers and activists had previously raised concerns about these issues,

suggesting that community resistance and public scrutiny influenced some technical reconsiderations (Hensengerth 2017a).

International Funding and Accountability Systems

Community resistance also extended to international accountability mechanisms. Complaints submitted to the International Finance Corporation's Compliance Advisor Ombudsman triggered reviews involving international NGOs and advocacy groups (Business & Human Rights Resource Centre 2021). This process increased international scrutiny of the project and highlighted the broader reputational risks faced by investors associated with the dam.

Legitimacy and Resettlement Commitments

In response to mounting protests, the Cambodian government introduced a revised resettlement package in 2013 valued at approximately USD 39 million. The program included housing, farmland, infrastructure, training programs, and financial allowances for displaced households (Business & Human Rights Resource Centre 2021).

However, around 53 families from Kbal Romeas rejected these resettlement packages, arguing that material compensation could not replace the cultural and spiritual significance of their ancestral lands (Carlo 2024; Hul 2017). As of June 2025, many residents continued to seek compensation for destroyed homes, agricultural land, and ancestral burial sites. Authorities have largely rejected these claims, arguing that residents voluntarily chose to remain in the area and that communal land titles cannot be issued within existing economic land concessions (Koem 2022; Bunly Soeung 2022b).

5. The Achievement of Indigenous Women-Led Protests

Srang Lanh, a Bunong woman and deputy village chief, was one of the main leaders. She spoke out strongly in favor of her community's right to stay on their ancestral land. At the time, the government and project developers offered villagers new homes in a resettlement site that had electricity and access to public services. But for Srang Lanh and dozens of others, these promises couldn't make up for what they were being asked to give up: their identity, traditions, sacred spaces, and connection to the land.

"We don't want electricity. We want to live with nature," she said. This statement became a symbol of the protest's deeper message: that cultural and spiritual survival should not be sacrificed for development.

A total of 52 families, most of them led by women, said they would not move. They rebuilt stilted homes above the waterline and stayed close to the land that had been flooded by the dam's reservoir, even though their original village was flooded. These women were very important for keeping the community's social and spiritual fabric strong. They held ceremonies, kept local knowledge alive, and helped each other get through daily life

even when things were very uncertain. They fought back not only with their bodies but also with the law and politics. These women worked to get petitions to the Cambodian government and worked with NGOs and civil society groups. They wanted fair payment for land that had been lost, rice fields that had been damaged, crops that had been destroyed, and burial grounds that had been flooded. Even though the government kept saying no to their demands, they kept going. They recorded their claims, set up peaceful protests, and talked to journalists and human rights activists.

One of their most important accomplishments has been to speed up the process of giving Indigenous people land titles. The women of Kbal Romeas kept their community together by refusing to move. This is a key requirement for claiming legal land rights under Cambodia's Land Law. They started mapping more than 2,000 hectares of ancestral land, including sacred forests, spiritual sites, and traditional farming areas, with the help of environmental and legal advocacy groups. This legal recognition gives them a way to protect their land from future development or private encroachment for a long time.

While full land titling is still not finished because of political and bureaucratic problems, the fact that people are trying to get it has brought Indigenous land rights to the forefront of national conversation in Cambodia. The women's work has brought attention to the gendered aspects of environmental justice, where women are not only victims of displacement but also powerful agents of change and protectors of cultural survival.

Their actions also had effects that went beyond their own lives. The protest in Kbal Romeas led to similar resistance movements among other Indigenous groups in Cambodia. It made people around the world more aware of how big hydropower projects in the Mekong region affect the environment and society. International human rights groups have used the case as an example in their reports. It also added to the larger discussions about sustainable development, climate resilience, and Indigenous sovereignty.

The women of Kbal Romeas are still an important part of the community's fight today. They teach the younger generation about their culture, run farming activities, and speak up for their people in court and other legal matters. Their leadership counters the usual stories that leave women out of making decisions about politics or the environment.

Their resistance is in many ways not just about land; it is also about their right to exist as an Indigenous people on their own terms, with dignity and identity. They have shown that development shouldn't be forced on people from above; it should include the voices and consent of the people who are most affected.

The protest in Kbal Romeas led by Indigenous women is a strong example of people standing up against unfair development. Even though under a great pressure from the state to leave their homes, these women stood their ground, protecting their cultural heritage, standing up for their legal rights, and demanding justice. Their successes are measured not just by legal victories or media coverage; they are also measured by their unwavering commitment to protecting a way of life that is in harmony with the land.

Their story reminds us that real progress must respect the rights of native people, recognize women's leadership, and put human dignity at the center of everything. In the flooded forests of Cambodia, the women of Kbal Romeas have become quiet revolutionaries, fighting for their village and a vision of justice and sustainability that the world cannot ignore.

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ABOUT THE AUTHORS

Dr. Wengki Ariando

Wengki Ariando is a scholar-activist specializing in political ecology, marine conservation, climate change adaptation, coastal and small island development, and indigenous resource governance, with a focus on sea nomads in Southeast Asia. He is currently a postdoctoral researcher at the Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV). Ariando earned his M.A. and Ph.D. in Environment, Development, and Sustainability from Chulalongkorn University. Post-Ph.D., his extensive background includes fellowships and research roles at Queen's University, Oxford University, Chulalongkorn University, and the Indonesian National Research and Innovation Agency. His scholarly work has been published in journals such as Political Geography, Ecology, Environment and Conservation, Conservation Science and Practice, Shima, International Journal of Conservation Science, and Journal of Marine and Island Cultures. Additionally, he authored the 2024 book, Stringing the Islands: The Bajau in Wakatobi. Dedicated to bridging academia and grassroots activism, he actively collaborates with governments, NGOs, artists, and indigenous movements to champion equitable coastal development and climate adaptation.

Associate Prof. Dr. Ratnaria Wahid

Ratnaria Wahid holds a Bachelor of Laws (LLB) with Honors from the International Islamic University Malaysia (IIUM). Along the way, she obtained the Advocate and Solicitor (Malaya) practicing certificate. She served as a Legal Advisor to CITI College in Taiping, Malaysia, and gained valuable experience as an Advocate and Solicitor in various Malaysian legal firms. She also earned her Master of Laws (LLM) at the Australian National University (ANU) in Canberra, Australia. Subsequently, she pursued her passion for legal scholarship by completing her Ph.D. at the University of East Anglia (UEA) in Norwich, United Kingdom. She further honed her expertise as a Postdoctoral Fellow at the Centre for Law, Technology, and Society at the University of Ottawa, Canada. Currently, she holds the distinguished position of Associate Professor at the Department of International Affairs within the School of International Studies at the College of Law, Government, and International Studies at Universiti Utara Malaysia. She was previously the Editor in Chief for the open-access Scopus-Indexed Journal of International Studies. In her role as an Associate Professor, she imparts her knowledge to students, teaching courses on public international law, human rights, and international environmental law at both the undergraduate and postgraduate levels. Her research interests primarily focus on copyright law, particularly within the context of educational technology. She is equally passionate about human rights and education, as well as public international law and environmental law.

Assoc. Prof. Bunly Soeung

Bunly Soeung is an associate professor at Svay Rieng University in Cambodia and has served as a senior fellow at the Cambodian Center for Regional Studies since 2023. He earned a master of political sciences from Padjadjaran University (Indonesia) and a master of education from the University of Hong Kong (China) in 2010 and 2015, respectively. His interdisciplinary research interests are cultural peace-building, transitional justice, and human rights. From 2019 to 2020, he served as a Member of the Nomination Committee for the Gwangju Prize for Human Rights of the May 18 Memorial Foundation in South Korea. He is a SHAPE-SEA Commissioned Researcher.

Ratna Juwita, PhD.

Ratna Juwita, PhD, has served as an Assistant Professor in the Faculty of Law at Universitas Atma Jaya Yogyakarta since 2015. She successfully defended her PhD dissertation, entitled Conceptualising Corruption as a Violation of Human Rights in Indonesia, on 12 July 2023. She is currently a Visiting Research Fellow in the Department of Transboundary Legal Studies at the University of Groningen.

Her research interests include international law, Indonesian law, anti-corruption, and human rights. Ratna is actively involved in several research communities. She joined the Development of International Law in Asia (DILA) in 2018 and, in 2020, became part of the International Law Association (ILA) Study Group on the Asian State Practice of Domestic Implementation of International Law, where she focuses on economic, social, and cultural rights. She is also affiliated with the Groningen Centre for Health Law (GCHL), the Aletta Jacobs Junior Research Network, and the Development, Security, and Justice research group under the Rudolf Agricola School for Sustainable Development.

Ratna has presented her work with the Interdisciplinary Corruption Research Network (ICRN) since 2021 and is a member of the Netherlands Network of Human Rights Research (NNHRR) and the Royal Netherlands Society of International Law (KNVIR). Since 2023, she has been recognized as an expert by Transparency International and included in its Expert Network. She is also a member of the UNCAC Coalition Working Group on anti-corruption and human rights, and in May 2024, she was appointed to the ILA Committee on Business and Human Rights.

From 2013 to 2017, Ratna was a copy editor for the Groningen Journal of International Law. She has reviewed manuscripts for various journals, including Organization Studies, Journal of Human Rights Practice, Crime, Law and Social Change, Journal of World Investment & Trade, Asia Pacific Journal on Human Rights and the Law, and Cambridge Prisms: Global Mental Health. In Indonesia, she served as Chair of the Law and Society Department at the Faculty of Law, Universitas Atma Jaya Yogyakarta (2018-2019).

Asst. Prof. Dr. Noe John Sacramento

Noe John Sacramento is an Assistant Professor of Public Policy and Political Science at the University of the Philippines (UP) Cebu and a nonresident adjunct faculty member at the School of Public Policy, Chiang Mai University, Thailand, where he earned his PhD. His teaching specialization includes policy analysis and critical policy studies. His research engages critical and interpretive approaches to policy and politics, with particular interest in deliberative policy analysis, narratives, deliberative spaces, informality, dramaturgy, emotions in deliberation, political ecology, critical urbanism, and the technical-participatory nexus in smart city planning. He is also interested in the critical pragmatist logic of policy analysis in contexts of high inequality, the development of critical policy studies in Asia, the interpretive and constructivist turn in public policy across the region, and the ways policy knowledge is contested and challenged in the face of power.

He is the founding convenor of the Philippine Critical Policy Studies Initiative, an affiliate of the Critical Policy Studies Network, and co-coordinator of the Emotions, Policy, and Society Network. He has published in journals such as Journal of Asian Public Policy, Critical Policy Studies, International Review of Public Policy, Public Administration and Policy, and Agrarian South: Journal of Critical Political Economy. He has also contributed book chapters to volumes published by Springer Nature, Palgrave Handbooks, and Edward Elgar Handbooks. Among his recent book projects are Policy Analysis in High Inequalities in Asia: Critical and Pragmatic Perspectives with Routledge (co-authored with Piyapong Boossabong and Pobsook Chamchong) and Policy Analysis in the Philippines with the University of Bristol's Policy Press (co-edited with Kidjie Saguin).

Assoc. Prof. Dr. Norafidah binti Ismail

Norafidah Ismail is an Associate Professor at the School of International Studies, Universiti Utara Malaysia, Kedah. Her areas of specialization are International Relations of the Middle East and International Political Economy. Before joining the faculty at Universiti Utara Malaysia in 2002, Dr. Ismail served as a Lecturer at Akademi INFOTECH MARA in Batu Pahat, Johor, Malaysia. She is co-author, with Tim Niblock, of "An intensifying Sino-Saudi relations." In Shen, S. and Blanchard, J. F. Multidimensional Diplomacy of Contemporary China (Lexington Books, 2010), and has delivered several conference papers on China's growing involvement in the Gulf. Dr. Ismail earned a B.A. from the International Islamic University, Malaysia, an M.A. in International Political Economy from the University of Leeds, and a Ph.D. in Arab and Islamic Studies from the University of Exeter, United Kingdom.

Assoc. Professor. Dr. Lorena Sabino

Dr. Lorena L. Sabino is an Associate Professor at the Department of Social Forestry and Forest Governance, College of Forestry and Natural Resources at the University of the Philippines Los Baños (UPLB). She holds a Ph.D. in Environmental Science with specializations in Social Forestry and Community Development. Her research focuses on the social dimensions of environmental issues, including climate change adaptation, disaster resilience, and sustainable livelihoods. Dr. Sabino's expertise extends to watershed management, agroforestry, and mangrove rehabilitation. Recently, her research has shifted towards examining the social implications of solar geoengineering as a climate change intervention. Dr. Sabino's dedication to climate-proofing, sustainable resource management, and community empowerment makes her an asset in advancing environmental conservation efforts locally and globally.

About SHAPE-SEA

The Strengthening Human Rights and Peace Research and Education in ASEAN/ Southeast Asia (SHAPE-SEA) programme aims to strengthen the knowledge, capacity, and networks of academics and institutions in Southeast Asia in the fields of human rights and peace. The programme seeks to contribute to the promotion and protection of human rights through research, education, and engagement with policymakers and civil society across the region.

SHAPE-SEA is a collaboration between two regional academic networks: the ASEAN University Network – Human Rights Education (AUN-HRE) and the Southeast Asian Human Rights Studies Network (SEAHRN). Through this partnership, SHAPE-SEA works with universities, researchers, and civil society actors to support human rights scholarship and strengthen research capacity in Southeast Asia.

The programme supports a range of initiatives including commissioned research, academic training, policy engagement, and knowledge dissemination. These activities aim to generate evidence-based research, strengthen regional dialogue on human rights issues, and support the development of a new generation of scholars and practitioners working on human rights and peace in Southeast Asia.

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Sweden
Sverige

Institute of Human Rights and Peace Studies
Mahidol University

SHAPE-SEA Secretariat
Room # 310, 3rd Floor
Institute of Human Rights and Peace Studies (IHRP)
Panyaphiphat Building
Mahidol University
999 Phuttamonthon Sai 4 Road
Salaya Nakhon Pathom 73170, Thailand

www.shapesea.com
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