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# Multilevel Governance and Indonesia's Strategy for Climate Change Mitigation and Adaptation

**Ali Muhammad**
Department of International Relations, Universitas Muhammadiyah Yogyakarta, Indonesia
alimuhammad@umy.ac.id
**Lucitania Rizky**
Department of International Relations, Universitas Teknologi Yogyakarta, Indonesia
lucitania.rizky@staff.uty.ac.id
**Ahmad Sahide**
Magister Program of International Relations, Universitas Muhammadiyah Yogyakarta, Indonesia
ahmadsahide@umy.ac.id
**Ilham Agustian Candra**
ASEAN, Peace, and Humanitarian Studies Center, Universitas Muhammadiyah Yogyakarta, Indonesia
ilhamagustiancandra@mail.ugm.ac.id
**Satria Iman Prasetyo**
Department of Governmental Studies, Universitas Muhammadiyah Yogyakarta, Indonesia
satria.iman.fisip18@mail.umy.ac.id
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## Abstrak

*Artikel ini mengkaji secara kritis kebijakan Indonesia dalam upaya mitigasi dan adaptasi perubahan iklim dalam konteks rezim iklim global dan dinamika politik lokal. Dengan menggunakan pendekatan multi-level governance, yang menekankan bahwa kekuasaan tersebar secara vertikal di antara banyak level tata kelola dan secara horizontal di berbagai organisasi dan aktor kuasi-pemerintah dan non-pemerintah, artikel ini menunjukkan bahwa kebijakan perubahan iklim Indonesia melibatkan tata kelola supranasional yang difasilitasi oleh rejim dan lembaga di tingkat global. Pemerintah memainkan peran strategis dalam menyesuaikan diri dengan rezim lingkungan global tersebut dengan mengadopsi dan menerapkan undang-undang dan langkah-langkah kebijakan guna membatasi emisi Gas Rumah Kaca (GRK), mengendalikan laju deforestasi, dan mengatasi degradasi hutan. Pencapaian tugas tatakelola ini melibatkan partisipasi aktif pemerintah daerah dan pemerintah kota serta melibatkan aktor-aktor non-negara, seperti pelaku bisnis serta masyarakat luas.*
*Kata Kunci: multi-level governance; kebijakan Indonesia; perubahan iklim; mitigasi; adaptasi*

## Abstract

*This article critically examined Indonesia's policies to mitigate and adapt to climate change within the global climate regime and local political dynamics. A qualitative method and a multilevel governance approach were utilized, emphasizing the dispersion of power both vertically among various levels of governance and horizontally among different quasi-governmental and non-governmental organizations and actors. The analysis unveiled that Indonesia's climate change policies have involved supranational governance facilitated by global-level regimes and institutions. The government has played a strategic role in aligning itself with these global environmental regimes by implementing laws and policy measures to limit greenhouse gas emissions, control deforestation rates, and address forest degradation. Achieving these governance tasks involved active participation from local governments, municipalities, and non-state actors such as businesses and the community.*
*Keywords: multi-level governance; Indonesian policy; climate change; mitigation; adaptation*

## INTRODUCTION

This article examined Indonesia's strategy for addressing and adapting to climatic change within the global climate regimes and local dynamics. Indonesia, situated in Southeast Asia, is susceptible to the effects of climatic change and fluctuation. Based on data from the World Risk Index 2022, the impact of climate change has brought Indonesia to the list of three countries most

prone to natural disasters (Ruhr University Bochum, 2022). Indonesia has experienced a notable rise in temperature, accompanied by a considerable alteration in the magnitude and distribution of precipitation. Several climate models concur that these patterns are anticipated to persist or maybe intensify in the forthcoming years. The phenomenon of climate change is anticipated to exert a substantial influence on several aspects of social and political existence, hence posing a threat to the sustainability of future developmental endeavors (Risky, Mahdi, Misbahuddin, & Candra, 2021).

Indonesia's strategy on climate change encounters a lot of complicated problems that come from its unique location and social and economic situation. Most of the time, deforestation is a serious problem. Even though Indonesia has a lot of tropical rainforests, its deforestation rates are among the highest in the world. It is mostly caused by logging and the growth of palm oil farms (Harris, Goldman, & Gibbes, 2019). This rapid loss of trees is a significant cause of the country's greenhouse gas emissions. The problem is exacerbated by the inappropriate enforcement of environmental laws and the insufficiency of checks and balances in place, allowing these harmful practices to continue (Pagiola, von Ritter, & Bishop, 2004). Indonesia's high reliance on coal as its main source of energy is also a significant problem when it comes to lowering emissions.

Moreover, Indonesia is progressively susceptible to the ramifications of climatic change, exemplified by the escalating sea levels that pose a significant threat to its numerous coastal villages and regions (Adger, Agrawala, & Mirza, 2007). The international community has paid attention to and put pressure on Indonesia because of its many problems. It is especially true in light of Indonesia's commitments under the Paris Agreement—a legally binding international treaty on climate change, of which the goal is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels." It illustrates how urgently Indonesia needs comprehensive and effective policy changes (UNFCCC, 2015).

In order to examine Indonesia's approach to addressing climatic change, it is crucial to consider the findings of the Climate Action Tracker (2021). This study has validated a critical evaluation, indicating that Indonesia has a "highly insufficient" performance in several aspects of climate change governance. Indonesia was deemed "highly insufficient" because of its continual high greenhouse gas emissions, high rates of deforestation, and reliance on fossil fuels. Despite global climate agreements, Indonesia's inadequate targets, governance issues, and the country's sluggish progress in switching to cleaner energy sources are the causes of this poor grade, emphasizing the urgent need for a more thorough and efficient climate policy.

Since Indonesia has proactively issued numerous mitigation and adaptation policy measures, it is crucial to examine the policy to develop a more effective strategy for addressing these multidimensional problems. Governance of climate change policy is predominantly determined by political commitment, institutional framework, policy issuance procedure, and stakeholder participation. This condition has become an opportunity to review the previous policies adopted by the central, provincial, and municipal governments, as well as community responses to collective and adaptive climate change action.

Indonesia's strategy on climatic change has been the subject of extensive investigation and analysis. Previous researchers have explored various facets of Indonesia's climate policy, ranging from international commitments to domestic implementation, deforestation mitigation, and adaptation strategies. Previous studies have proven that climate change adaptation policy is a process that requires contributions from multiple actors in terms of providing knowledge, planning, coordination, and long-term planning (Andriani & Setyowati, 2016; Fankhauser, 2017; Nasiritousi, Hjerpe, & Linnér, 2016). Collaborative action at the global level in the institutional field is required, such as the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement, and the Kyoto Protocols, reflecting world concern for environmental governance (Leggett, 2020). However, equity and

legitimacy at the domestic level are crucial, as they are the ones that regulate public action and its relation to sustainable development (Adger, Arnell, & Tompkins, 2005). The subsequent section will first elaborate on previous studies' methods and continue with results and analysis,

## LITERATURE REVIEW

Previously, Wicaksana (2015) examined the obstacles in implementing Indonesia's climate change policies, originating from both the domestic and international levels. At the international level, the high economic necessity and political domination of the major partner countries entice them to ignore the norms of environmental preservation. Meanwhile, the actions at the domestic level are caused by the lack of harmony in the regional and central government, especially the complexity of the people who are still conservative in showing their indifference to climate change.

In providing an outlook of how climate change adaptation works in Indonesia, Kawanishi, Preston, and Ridwan (2016) assessed the efficacy of Indonesia's climate change adaptation strategy—the National Action Plan for Climate Change Adaptation (RAN-API). This study demonstrates the existence of a disparity between the implementation of RAN-API and the perspectives of policymakers, which can be attributed to deficiencies in information and expertise. This study is also consistent with the idea of research of Morizane et al. (2016), arguing that Indonesia needs to develop climate change adaptation actions that prioritize institutional arrangements.

Moreover, Triyant et al. (2021) also conducted an analysis of the economic and social conditions in relation to climatic change. It is useful for understanding how society perceives and responds to climate change. It has been observed that in Indonesia, there exists a necessity for a significant focus on climate change adaptation that places importance on modifying economic and social factors, including welfare levels, health conditions, educational opportunities, participation rates, technological advancements, and the development of social capital.

This research narrows down several essential references previously mentioned to offer climate change adaptation policies that focus on capacity building as an effort to build environmental governance using a multilevel governance (MLG) approach. This approach was developed by Hooghe and Marks (2001) with the objective of gaining a comprehensive understanding of the political mechanisms involved in the formation of supranational organizations. Additionally, it seeks to facilitate the examination of decentralized decision-making, wherein sub-national governments and civil society have gained significant influence. The term "multilevel" denotes the existence of diverse state and non-state entities positioned at discrete levels, encompassing the sub-national, national, and supranational levels. The matter recognized by scholars in the realm of multilevel governance (MLG) pertains to the imperative of harmonizing many levels of government to assist the attainment of common goals (Bache & Flinders, 2004).

Based on the MLG theory, the traditional notion of states having exclusive authority over policymaking has become increasingly uncertain, hence diminishing their role as the key or essential actors in this sphere. However, the influence of the government's power is progressively molded by and distributed among various actors functioning at several tiers. As a consequence of this development, "the role of the state is being transformed as state actors develop new strategies of coordination, steering and networking that may protect and, in some cases, enhance state autonomy" (Bache & Flinders, 2004). The fundamental premise of MLG theory posits that, currently, there is a sequence of transformations in the dynamics and patterns of engagement between states and other tiers of governance. It presents the problem of delineating novel methods of control and responsibility among these governmental entities.

According to Hooghe and Marks (2001), MLG can be categorized into two basic categories. However, the focus of this study mostly aligns with the first category, known as MLG, which denotes a form of governance characterized by a well-defined structure and a hierarchical arrangement wherein decision-making authority is concentrated within a select group of

individuals (Fairbrass & Jordan, 2004). The primary focus of this analysis centers on the interplay between several tiers of governance within the context of MLG and the resultant implications for policy decisions.

According to this perspective, national states continue to maintain a pivotal role in determining common objectives. However, it is perceived that local governments and non-state actors have the potential to circumvent national-level decision-making by framing issues in local contexts. Alternatively, they may establish efficacious partnerships on a global scale, thereby circumventing engagement at the national level. Nevertheless, despite the inherent flexibility, the effectiveness of these governance levels is contingent upon the presence of national-level governance structures. It is the governmental frameworks established by nation-states that can facilitate the potential to circumvent national-level decision-making processes, either through localization or globalization (Betsill & Bulkeley, 2003).

This study discloses the complex interplay between global and local processes and highlights Indonesia's multilevel governance approach as a strategy to deal with climate change. It illustrates how Indonesia's climate change policy is not limited to the actions of supranational governance through the International Environmental Agreements (IEAs). It is a profound connection between the central government and the participation of the subnational level and several non-state actors. Indonesia's determination to combat climate change globally is demonstrated by its support of a series of IEAs, including UNFCCC, the Kyoto Protocol, the Paris Agreement, and the REDD+ Program. The real power of these efforts, however, comes from the coordinated efforts of local and municipal governments, as depicted by the case studies such as Padang, Jakarta, Semarang, Kapuas Hulu, and Jayapura, together with the participation of business actors and the communities. Indonesia needs a more effective combination of international obligations with localized efforts to transition from a global to a local approach and boost its capacity to deal with the problems posed by climate change.

## RESEARCH METHOD

This article utilized a qualitative research method (Patton, 2014) with a case study approach (Flyvbjerg, 2011; Yin, 2014). Qualitative research refers to a methodological approach that entails the analysis and interpretation of textual data as well as observations to identify significant patterns that describe a specific event. Policy research encompasses various approaches, including descriptive, analytical, and causal analyses. It necessitates the examination of existing policy programs, the description of exemplary practices, the measurement of social change, and the development of projections.

## RESULT AND ANALYSIS

### GLOBAL CLIMATE REGIME: FROM KYOTO TO PARIS

The core tenets of the global climate change regime, as delineated by the UN Framework Convention on Climate Change (UNFCCC) in 1992, encompass a range of dimensions, including international collaboration, endeavors to mitigate greenhouse gas emissions, strategies for adapting to evolving climate conditions, financial backing for climate-related initiatives, and the equitable allocation of obligations among governing bodies. The primary focus of the treaty, known as the Paris Agreement, is to define objectives designed to mitigate global warming and improve adaptation on a global scale (UNFCCC, 2015).

To conduct a study of Indonesia's climate policy, it is essential to begin by examining the global climate regimes. The Kyoto Protocol, founded in 1997 and implemented in 2005, signifies the first internationally binding accord designed to deal with the issue of global climatic change. The accord mandated that developed nations reduce their emissions by an average of 5% below the levels documented in 1990. Furthermore, a comprehensive monitoring system was implemented to effectively monitor the progress achieved by each participating country. Nevertheless, the pact did not enforce a requirement for economically disadvantaged nations to implement measures. However, the Paris Agreement, widely regarded as the preeminent global climate agreement to date, requires all countries to adopt

commitments aimed at mitigating emissions. Governments set forth objectives, known as Nationally Determined Contributions (NDCs), with the aim of preventing the global average temperature from surpassing a 2°C (3.6°F) rise above pre-industrial levels and actively working toward keeping it below a 1.5°C (2.7°F) limit. Furthermore, the primary aim of this endeavor is to attain a state of global net-zero emissions by the latter portion of the century, wherein the quantity of greenhouse gases emitted into the Earth's atmosphere is equal to the amount removed from it (Turner-Walker et al., 2021).

The Paris Agreement established adaptation as a worldwide objective, aiming to improve a capacity for climate change adaptation, bolster resilience, and decrease susceptibility to its impacts. This objective is intended to support sustainable development and provide an appropriate response to adaptation needs. The obligation of developed countries to offer aid for mitigation and adaptation in underdeveloped countries is outlined in Articles 3.1 and 4.4. The 21st Conference of Parties (COP) convened within the framework of the UNFCCC in Paris in 2015, when significant climate funding goals were set. Moreover, Scoville-Simonds (2016) restated previous pledges to allocate an annual sum of USD 100 billion for global climate finance. The pledged climate funding of at least USD 100 billion by industrialized nations to support developing nations was distributed between initiatives aimed at mitigating climate change and those focused on adapting to its impacts (Scoville-Simonds, 2016). The justification for the allocation of adaptation funding is grounded in moral and legal principles.

In 2010, the Conference of Parties (CoP) ratified the Cancun Agreement, which underscored the equitable significance of addressing both mitigation and adaptation in endeavors to combat climatic change. Furthermore, the accord stipulated the allocation of additional financial resources to assist underdeveloped nations, thereby establishing the groundwork for the following Paris Climate Accord. The discourse surrounding the financing of adaptation primarily focused on highlighting the notion of collective accountability within the framework of global policy structures pertaining to adaptation. The Bali Action Plan developed in 2007 and the Copenhagen Accord founded in 2009 have significantly contributed to the advancement of international policy discussions on adaptation (Michaelowa & Stadelmann, 2018).

In 2007, the Conference of Parties (COP) officially approved the "Bali Action Plan," which marked the beginning of a comprehensive undertaking designed to facilitate the complete, effective, and sustainable implementation of the regime through the utilization of long-term collaborative strategies. The origins of the allocation of adaptation resources can be attributed to the UNFCCC. According to this agreement, parties achieving a higher level of development are obligated to offer assistance to developing parties, particularly those most vulnerable to the adverse effects of climate change. This assistance aims to aid their endeavors in addressing the financial burdens associated with implementing adaptation measures (Turner-Walker et al., 2021).

Since then, the rate of global adaptation finance has steadily risen in terms of project support, overall pledges, and aid designated for adaptation (Scoville-Simonds, 2016). Climate finance is predicted to be of the same magnitude as development aid in the future (Scoville-Simonds, 2016). At present, a significant portion of financial resources allocated for adaptation initiatives has been transferred from developed countries to less affluent nations in the form of official development assistance (ODA). This ODA specifically targets adaptation efforts or activities connected to adaptation (Scoville-Simonds, 2016). The yearly allocation of adaptation ODA has exceeded USD 10 billion, establishing it as the most substantial source of funding for adaptation initiatives (Scoville-Simonds, 2016).

The international community ratified the Paris Agreement in 2015 as a means to mitigate global greenhouse gas (GHG) emissions. Each nation, including Indonesia, established its objective for reducing GHG emissions, which was then outlined in their respective NDC declaration. Indonesia has established a goal of achieving a 29% reduction in emissions through domestic initiatives while also aiming for a 41%

reduction with the assistance of international help. The climate ambition was bolstered in the updated NDC through the reinforcement of commitments, operationalized through various programs, strategies, and actions in the domains of mitigation, adaptation, transparency framework, and other complementary implementation instruments.

## IMPLEMENTING GLOBAL CLIMATE REGIME TO THE NATIONAL LAW AND POLICY

Ranked as the third-largest tropical rainforest globally (Shahbandeh, 2022), Indonesia has the huge potential to reduce global carbon emissions while also protecting the integrity of existing resources. As a developing country and an archipelagic nation heavily dependent on natural resources, Indonesia's decision to comply with international norms and ratify policies related to global climate change is an appropriate action. Human activities such as urbanization, deforestation, and industrialization in Indonesia are responsible for most of the effects of climate change (Juslimin, 2013). Climate change significantly affects economic, social, and political factors. Indonesia responds to the complexity of this issue by adhering to various steps and policies related to climate change mitigation and adaptation based on a series of International Environmental Agreements (IEAs).

Indonesia's climate change law and policy evolved as a result of the country's compliance with global environmental norms, which are consistent with national interests related to the sustainability of Indonesia's natural environment and the constitution (Faiz, 2016). As stated in Article 28H, paragraph 1 of the Indonesian constitution, "Everyone has the right to live in physical and spiritual prosperity, to have a place to live, and to have a good and healthy environment...". It is emphasized that every Indonesian citizen has the right to acquire constitutional protections for a good and healthy environment to live. Furthermore, Article 33, paragraph 3 of the constitution also declares: "The national economy is organized based on economic democracy, with the principles of unity, fair efficiency, sustainability, environmental consciousness, independence, and by maintaining a balance between progress and national economic unity." This article demonstrates that national development in Indonesia will be meaningless if environmental considerations are not considered. These articles comprise the essence of the fundamental mandate for the implementation of sustainable development-related national development policies and programs in Indonesia.

The implementation of an international climate regime that results in an agreement to ratify the UNFCCC as an organization and convention that actively addresses climate change issues is the first step in Indonesia's strategic contribution to address environmental issues. It can be proven by the implementation of Law No. 6 of 1994. The process and consideration for ratification of the convention demonstrate Indonesia's concern in stabilizing the concentration of greenhouse gases (GHG) as a mandatory action for the implementation of sustainable development, playing an active role in maintaining and controlling the management of natural resources that comprise a single unit climatically oriented system. Then, Indonesia demonstrates its commitment to the UNFCCC by ratifying the Kyoto Protocol as a follow-up of the third session of the conference of the parties. This convention represents the development of the international regime that recognizes the need for modifications and readjustments. In this instance, the Kyoto Protocol has been ratified by Indonesia via Act No. 17 of 2004. Essentially, the Kyoto Protocol has three mechanisms (UNFCCC, 2023): (1) emission trading (carbon market), (2) a clean development mechanism, and (3) joint implementation. At the time, the CDM was the only mechanism in which developing countries could participate. In response, Indonesia arranged renewable energy-based industrial development and transportation (UNFCCC, 2023).

The issue of emissions resulting from forest conversion for oil palm plantations on peatlands is a perennial topic of discussion in IEA reports. Indeed, the rapid growth of oil palm plantations is a result of their high economic value, with crude palm oil (CPO) sales contributing to foreign exchange, income, and large-scale employment. In contrast, the development of the

expansion of oil palm plantations must be a national concern because a decline in tropical rainforest cover accompanies it (Wibowo, 2010). Then, an agenda that began to focus on discussing the problem of deforestation emerged in Montreal, Canada, in 2005. It is a COP-11 of the UNFCC, which considers a document entitled "Reducing Emission from Deforestation in Developing Countries: Approaches to Stimulate Action" – later becoming formulation of the REDD – submitted by Papua New Guinea and Costa Rica, in the name of the Coalition for Rainforest Nations (UNFCCC, 2005). Many parties responded positively to this document, raising the challenge of how national circumstances could be accommodated fairly and equitably considering the way forestry issues were being addressed under the climate convention (Maryani et al., 2012). Indonesia has successfully facilitated discussions, coordination, and consultations pertaining to Reducing Emissions from Deforestation and Forest Degradation (REDD) matters following a prolonged two-year debate on the subject.

To begin preparations for the COP-13 meeting held in Bali in 2007, Indonesia has previously issued Presidential Regulation No. 6 of 2007 regarding forest regulation and planning. This regulation defines layout planning for forest destruction control and rules governing the use of forests as objects whose natural resources must be preserved. Indonesia has demonstrated its commitment through the Ministry of Environment and Forestry, which set up the Indonesian Forest Climate Alliance (IFCA) and subsequently produced a study on REDD+ and a framework for reducing emissions from deforestation and forest degradation (Noordwijk et al., 2008).

Soon after the COP, Indonesia enacted Law No. 31 of 2009 to specifically regulate climate change mitigation and adaptation initiatives (Auli, 2022). The Indonesian government has implemented a mitigation strategy known as the National Action Plan to reduce GHG emissions (RAN GRK) to address GHG emissions. This plan is governed by Presidential Regulation No. 61 of 2011, which specifically addresses RAN GRK, and its inventory management is overseen by Presidential Regulation No. 71 of 2011, which pertains to the national greenhouse gas inventory. Indonesia's National Planning Agency (BAPPENAS) has also committed to enhancing economic resilience, social resilience, livelihoods, and ecosystem resilience as part of its adaptation endeavors. Notably, Indonesia has demonstrated substantial dedication toward formulating and executing the National Climatic Change Adaptation Plan (RAN-API) since 2014. This plan encompasses a coordinated and integrated framework for national adaptation, which effectively prioritizes development objectives (Fauzia & Ruhaeni, 2019).

Indonesia has certainly taken progressive action to address climate change issues at the national level. It is due to participation in ratifying numerous conventions and implementing applicable international norms and regimes concerning the significance of mitigating and adapting to climate change. Moreover, when the Kyoto Protocol had to be ended due to a lack of commitment, the major countries holding the world's industry failed to achieve the world's emission reduction target. It was later updated with COP-21, which resulted in Decision 1/CP.21 on the adoption of the Paris Agreement in 2015—Indonesia has to comply with the outcomes of this international norm by ratifying it via Law No. 16 of 2016 (Windyswara, 2018). In this regard, the Paris Agreement has high specificity in its principle as a norm (Streck et al., 2016), notably related to the implementation, which is based on the ability of each participating nation, formally known as a nationally determined contribution (NDC).

In pursuant to the fact that this NDC policy enables Indonesia to readjust to domestic issues, the solutions for implementing adaptation and mitigation will generate various commitments from each nation. In relation to the issues, Indonesia has also set a target to decrease its GHG emissions by 29% unconditionally and up to 41% conditionally with international assistance by the year 2030, in comparison to a scenario where no action is taken (Falah, 2017). This NDC policy was subsequently implemented by Indonesia by establishing the Climate Change Directorate General of the Ministry of Environment and Forestry with the following responsibilities (Miranti et al., 2018): (1) raising the effectiveness of climate change mitigation and

adaptation, (2) decreasing the area of forest and land fires, and (3) expanding areas with climate change adaptation capacity and facilitating programs and processes related to climate change the various government sectors and stakeholders have implemented.

Through its RAN GRK and RAN API, BAPPENAS initiated the NDC implementation by devising nine implementation strategies (Falah, 2017; Fauzia & Ruhaeni, 2019): (1) building ownership and commitment; (2) capacity building; (3) enabling environment; (4) developing framework and network; (5) one GHG-Data policy; (6) developing policies, planning and international program; (7) developing guidance on NDC implementation; (8) NDC implementations; and (9) monitoring and review of NDC. The fulfillment of the Paris Agreement and the NDC aligns with the implementation of the universalism principle in relation to the sustainable development agenda. This principle is also incorporated as one of the national development missions of the BAPPENAS.

**Table 1.** Stakeholders and Their Roles and Responsibilities in Achieving NDC Objectives

| **Stakeholder** | **Roles and responsibilities in NDC scope of work** | |
|---|---|---|
| | **Mitigation** | **Adaptation** |
| Coordinating Minister for Maritime and Investment Affairs and other relevant ministers and government institutions related to NDC | - Arranging GHG emission baselines at the national level<br>- Implementing an inventory of GHG emissions at the national level<br>- Arranging and examining national-level climate change mitigation targets and actions determined by the minister and outlined in the NDC document<br>- National monitoring and evaluation of climate change mitigation | - Coordinating to determine the sectors for climate change adaptation implementation<br>- Arranging baselines and climate resilience targets prior to implementation<br>- National monitoring and evaluation of climate change adaptation |
| Governor | - Arranging GHG emission baselines in accordance with ministerial decrees while considering district or city-level results.<br>- Implementing and reporting the results of provincial GHG emission inventories<br>- Identifying objectives and implementing mitigation actions in accordance with ministerial decrees | - Arranging a climate change adaptation plan referring to the national level climate change action plan, the Provincial Medium-Term Development Plan (RPJMD), and the Provincial Environmental Protection and Management Plan (RPPLH)<br>- Evaluating and monitoring climate change adaptation at the provincial level |

| | | |
|---|---|---|
| | - Monitoring and evaluating climate change mitigation at the provincial level | |
| Regent or Mayor | - Implementing and reporting an inventory of GHG emissions at the regency or city level<br>- Contributing to the reduction of GHG emissions at the sector and subsector levels | - Arranging climate change adaptation plans referring to provincial-level climate change action plans, Regency or City Medium-Term Development Plan (RPJMD), and Regency or City Environmental Protection and Management Plan (RPPLH)<br>- Evaluating and monitoring climate change adaptation at the regency or city level |
| Business actors and communities | - Contributing to the reduction of GHG emissions at the sector and subsector levels<br>- Implementing and reporting an inventory of the business's GHG emissions | - Contributing to enhancing climate resilience as part of the implementation of climate change adaptation actions |

*Source:* Drawn From the Presidential Regulation No. 98 of 2021

## PRACTICES OF LOCAL AND MUNICIPAL GOVERNMENTS

Considering Indonesia's climatic change strategy, this research incorporates a representative selection of local or municipal governments experiencing climatic change. The inclusion of these areas has been conducted with great attention to detail. Five local or municipal governments were selected as the sample of representations, i.e., Padang, West Sumatra; Jakarta, Special Capital Territory; Semarang, Central Java; Kapuas Hulu, West Kalimantan; and Jaya Pura, West Papua. These regions experienced the same pattern of climate change impact within flood, sea level rise, and dry areas, impacting the society the most. UNDP claimed that decentralization would benefit Indonesia the most by providing suitable administration policies for each region (Djalante & Thomalla, 2012).

### Padang, West Sumatera

West Sumatra has been impacted by climatic change, as evidenced by the changes occurring in Singkarak over the past 30 to 40 years. The transformation has been gradual, with previously fertile areas now becoming arid. This case is a notable illustration of the pronounced shifts happening in certain regions of West Sumatra. Consequently, local communities have had to adapt their agricultural practices due to the vulnerability caused by these shifts in the local climate (Febriamansyah, 2017; Mutiara et al., 2020). Furthermore, it is just one example of the phenomenon that has made West Sumatra increasingly aware of policies related to climate change mitigation, given the significant reliance of the local population on various aspects impacted by climate change. The government conducted a review in 2014, mobilizing a team of researchers to focus on three priority

impacts of climate change: (1) increased CO2 emissions due to the conversion of forest land into developed land; (2) increased N2O and NH4 emissions due to the conversion of rice fields and wetlands into developed land; and (3) altered patterns of rainfall and extreme temperature events (Hermon & Ratna, 2014).

Padang is the sub-national model for climate change in Indonesia because Pithas has a high renewable-energy generation potential. West Sumatra has made a significant contribution to the completion of the REDD+ program through its active participation in the Indonesia 11 program, designating it as one of ten cities participating in climate change mitigation (The Ministry of Environment and Forestry of the Republic of Indonesia, 2018), considering the significance of local factors in the REDD+ fulfillment standard (Apriwan & Afriani, 2015). The strategy focuses on community-based forest management (CBFM) and preventing forest and land fires. CBFM is a forest management strategy provided to the surrounding rural community as the primary actor. It consists of several components: village forests, community forests, community plantation forests, and partnerships (The Ministry of Environment and Forestry of the Republic of Indonesia, 2018).

### Jakarta, DKI Jakarta

The initiation of relocating Indonesia's capital to Kalimantan is undoubtedly a response driven by the consideration of the ongoing impact of climatic change affecting Jakarta for a prolonged period. International news coverage has extensively spotlighted this issue, offering professional analyses of the situation faced by Jakarta, the capital of Indonesia. Jakarta has experienced significantly low air quality due to pollution, and several areas along the coastal regions have been gradually being inundated (Al Jazeera, 2022). Thus, relocating the capital of Indonesia from Jakarta to Kalimantan is deemed a critical step in protecting the populace. However, according to a study conducted by BRIN, without aggressive action to combat climate change by 2050, the city of Jakarta could shrink by as much as 25 %. Recent research conducted by the Institut Pertanian Bogor (IPB) disclosed that several areas in Jakarta might experience annual rainfall ranging from 1.8 cm to 10.7 cm beginning in 2019 (Aldrian, 2021). Moreover, considering the large population, the Jakarta government is also unable to meet the demand for clean water supply for its ten million residents and an additional 15 million commuters and workers who come there daily (Aldrian, 2021). Consequently, the insufficient supply of clean water becomes a crucial reason for addressing the impacts of climate change.

In addition to the efforts of relocating Indonesia's capital away from Jakarta, collaborative initiatives between the Netherlands and Indonesia in 2011 also aimed at addressing the issues. It led to the initiation of the construction of a sea barrier along the Jakarta Port and the expansion of the bay to facilitate pumping floodwaters into the sea. This ambitious project is known as the Giant Sea Wall, as outlined in the Governor Decree No. 1685 of 2015. Furthermore, the management of water absorption channels has been a central focus for the Jakarta government. They have been working on improving and constructing river reservoirs to enhance canal flow and increase canal pathways. Recognizing the urgency of addressing the impacts of climate change, the government also issued Governor Decree No. 96 of 2020 to establish a climate change task force. It demonstrates the concern and the need for swift action in dealing with the challenges posed by climate change (Rahmayanti, 2021).

### Semarang, Central Java

Semarang has experienced climate change pressures as a result of having a lengthy coastline. This city is vulnerable to climate change as population concentration and economic activity have been rising along the length of the coastline. This city itself has experienced many consequences from climate change, including flooding, typhoons, and others. According to data resulting from internal climate change, there is a rise in surface water temperature, an increase in the intensity of downpours, a rise in the water level of the ocean, and a change in the pattern of its waves (Mulyana et al., 2013).

Semarang has taken the initiative to lead the charge against climate change in Indonesia. The city has partnered with the "Asian Cities Climate Change

Resilience Network" and has been actively engaging in discussions to establish a task force focused on adapting to climate change. Additionally, Semarang is diligently assessing and overseeing the city's resilience in facing the impacts of climatic change. The city has also undertaken a pilot project encompassing various areas, such as constructing seawalls, planting mangroves, renovating housing through microcredits, implementing measures to mitigate landslides, and establishing a drought warning system (Jacobson, 2014).

### Kapuas Hulu, West Kalimantan

According to the National Agency for Disaster Management (BNPB), Kapuas Hulu is one of the West Kalimantan regions predicted to experience mass land clearance and unusual inundation. It was the beginning of land opening in Kapuas Hulu in the 1970s, and land opening activity has escalated steadily since the introduction of the Logging Concession (HPH) and the Forest Plantation Wood Production Permit (IUPHHK-HA) (Bhwana, 2021). During the reign of President Suharto, forestry activities in Kapuas Hulu rose, whether carried out by private companies or the government, illegally or legally, and in all forms. In 2005, Kapuas Hulu began to experience this activity, deteriorating the condition of the land in the area. It is in contrast to other regions that have long experienced their land being used for logging (Chakib, 2014).

Kapuas Hulu collaborated with the German Federal Government through *Deutsche Gesellschaft Fur Internationale Zusammenarbeit* (GIZ), supporting (Forest and Climate Change Programme, 2019): (1) the designation of biosphere reserve by giving the workshop and training, including the local government to create management body of the biosphere reserve; (2) district-wide mapping peat areas and high carbon stock to protect essential ecosystem zone (EEZ); and (3) the start of business engagement in the palm oil sector with full traceability. In addition, WWF also plays a significant role in approaching social communities in Kapuas Hulu using an andragogi approach to engage and educate them about climate change (Lorens et al., 2013). It is believed to be the most expedient method for rehabilitating forests through the efforts of the local community.

### Jayapura, Papua

The city of Jayapura remains untouched by mining activities, deforestation, land clearing for palm oil cultivation, and sea-level rise, largely due to the presence of democratic freedoms in the region (Ullal & Germano, 2021). However, it does not mean that Jayapura is exempt from the impacts of climate change. It is documented that Jayapura is a coastal city, making it highly vulnerable to sea-level rise resulting from climate change. As sea levels rise, coastal erosion, saltwater intrusion into freshwater sources, and flooding become more frequent and severe. Low-lying areas of the city may be particularly susceptible to inundation, leading to damage to infrastructure, displacement of communities, and loss of property.

The measures implemented in Jayapura to mitigate the effects of climate change are comparatively less comprehensive than those in certain other areas, mostly due to constraints in executing experimental initiatives and strategies. Nevertheless, the indigenous population of Jayapura has engaged in cultural practices for a long time to depict changes in their surrounding landscapes. They create maps by hand directly onto rolls of paper to illustrate the transformations in the area (Carvalho, 2023). Addressing these challenges requires a combination of mitigation and adaptation strategies, including efforts to reduce greenhouse gas emissions, improve infrastructure resilience, enhance disaster preparedness and response mechanisms, and promote sustainable development practices. Collaboration among government agencies, communities, civil society organizations, and international partners will be essential to effectively address the impacts of climate change in Jayapura (Chumbler, 2021).

## CONCLUSION

This study has unveiled the complex interplay between global and local processes and highlighted Indonesia's multilevel governance approach as a strategy to deal with climate change. It depicts how Indonesia's climate change policy is not limited to the actions of supranational governance through the International Environmental Agreements (IEAs). It is a profound

connection between the central government and the participation of the subnational level and several non-state actors.

Indonesia's determination to combat climate change globally has been demonstrated by its support of a series of IEAs, including UNFCCC, the Kyoto Protocol, the Paris Agreement, and the REDD+ Program. The real power of these efforts, however, came from the coordinated efforts of local and municipal governments, as illustrated by the case studies such as Padang, Jakarta, Semarang, Kapuas Hulu, and Jayapura, together with the participation of business actors and the communities. Indonesia needs a more effective combination of international obligations with localized efforts to transition from a global to a local approach and boost its capacity to deal with the problems posed by climate change.

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