Jurnal Penelitian Politik, Volume 21 No.1 Tahun 2024
journal homepage: https://ejournal.brin.go.id/jpp
DOI: 10.14203/jpp.v21i1.1688

RISING SEAS, RISING STAKES: CLIMATE ADAPTATION IN BANYUWANGI'S COASTAL COMMUNITIES AND ITS IMPACT ON INDONESIA'S RESILIENCE AND ASEAN'S SECURITY

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Accepted: 3 Januari 2025; Revised: 30 Januari 2025; Approved: 30 Januari 2025

Abstract

The rising seas caused by climate change present significant challenges to coastal communities worldwide, particularly in vulnerable regions like Banyuwangi, Indonesia. This paper examines the intersection of climate change adaptation strategies and their socio-economic and environmental impacts in Banyuwangi's coastal zones. By analysing government policies, community initiatives, the study highlights the region's effort to address sea-level rise, coastal erosion, and biodiversity loss. It further explores how these localised contributed to Indonesia's broader resilience and ASEAN frameworks against climate change. The findings emphasise the importance of community engagement, innovative policies, and multi-sectoral collaboration to mitigate the risks posed by rising seas, ensuring the sustainability of coastal livelihoods and ecosystems. This study contributes to the growing body of literature on climate adaptation, offering actionable insights for policymakers and stakeholders in similar place across the Southeast Asia region.

Keywords*: Climate change, resilience, maritime, Banyuwangi, Indonesia, ASEAN.*

Introduction

Climate change is posing impacts on coastal areas globally and presenting significant threats to ecosystems, economies, and human populations. Rising sea levels, driven by the melting of polar ice and the thermal expansion of seawater, are among the common pressing challenges (Oliver-Smith, 2009). As sea levels rise, low-lying coastal zones face increased risks of flooding, erosion, and saltwater intrusion, jeopardizing freshwater supplies and agricultural productivity. Many countries are affected by climate changes including Indonesia.

Indonesia is a country that located among the Indian Ocean, Andaman Sea, South China Sea, and the Pacific Ocean. It has an extensive coastline of approximately 173,000 kilometres and is surrounded by significant bodies of water including sea, gulf, and straits (Secretariat, 2006). The country experiences warm and humid climate year-round since it has equatorial location.

Indonesia, as an archipelagic country, is particularly vulnerable, with major coastal area and environment exposed to higher storm surges and extreme weather events. Warmer ocean temperatures and acidification are disrupting marine ecosystems, affecting biodiversity and fisheries that millions of people rely on food and livelihood (Kumari & Garg, 2024). These environmental stressors lead to remote catching (Moegni et al., 2014), with some coastal communities facing displacement and increased vulnerability to poverty (Yokoyama et al., 2023) (Fujii, 2016) (Sato, 2024). The compounded effect of these calls for urgent and comprehensive adaptation strategies, as the repercussions of coastal climate impacts are felt

not only locally but also contribute to broader social and economic instability on a global scale.

Rising sea levels also pose a significant security threat to Indonesia, particularly to its outer islands, many of which are low-lying and vulnerable to submersion. For example, Jakarta in Indonesia, is among the sinking rapidly cities globally, with sea levels rising faster than the city's elevation each year (Hebron, 2024). As global temperatures continue to increase due to climate change, polar ice melts and ocean waters expand, causing sea levels to rise. This puts Indonesia's extensive archipelago, especially its outermost islands as boundaries with 10 neighbouring countries, at risk of sinking or being severely eroded (Apriani et al., 2014). If these islands disappear, it could not only result in the loss of valuable land but also impact the country's maritime boundaries which potentially leading to disputes over territorial waters and resources. The sinking of these islands would have profound social, economic, and environmental consequences, including loss of biodiversity and increased vulnerability to natural disasters.

While Indonesia faces significant challenges from climate changes above, it also holds immense potential to contribute to global climate resilience and environmental security. This country can offer examples in developing and implementing innovative adaptation strategies. Indonesia is rich with natural resources, such as mangroves, coral reefs, and rainforests, serve as critical buffers against climate impacts while also acting as carbon sinks. Through initiatives like ecosystem restoration, sustainable coastal management, and community-driven adaptation projects, Indonesia can strengthen its resilience and security while sharing valuable lessons with other countries facing similar challenges. By leveraging its unique geographic and ecological strengths, Indonesia has the opportunity to not only safeguard its communities and environment but also play a vital role in global fight against climate change. To do so, this paper reviews Banyuwangi in Indonesia as a case study.

Banyuwangi, a district with strategic maritime significance due its location along shipping routes and tourism destiny, serves as a microcosm for understanding how climate adaptation community-based can contribute into broader security program. Climate-induced risks, namely rising seas, erosion, and extreme weather events, disrupt local livelihoods and strain resources are factors that collectively fuel social instability. Given Indonesia's vast coastline and reliance on coastal resources, Banyuwangi's experience serves as a pressing example of the need for integrated policies that bolster resilience against climate impacts. Strengthening Banyuwangi's climate adaptation efforts can contributes to Indonesia's national security by reducing vulnerabilities, enhancing resource management, and maintaining stability in one of Southeast Asia's most strategically positioned regions.

This paper is addressing two important questions, 1) What are the adaptation strategies employed by the people of Banyuwangi in response to the impacts of climate change that have enhanced Indonesia resilience? 2) How do these community-driven efforts contribute to ASEAN's endeavours in achieving environmental security? In addressing these two questions, the paper divided into five parts. First part explores literature review to explore existing literature about the topic. Second part explains impact of Climate Change on Banyuwangi's Coastal Regions. Third part reviews community-based adaptation strategies in Banyuwangi. Fourth part explains relation between local and Indonesia's climate resilience. Then, last part explores ASEAN frameworks addressing environmental security.

Literature Review

This study of climate change adaptation in Banyuwangi's coastal areas is crucial, as it highlights the interconnectedness of environmental issues and national security concerns for Indonesia. Existing studies on climate change reveal that rising sea levels and intensified coastal impacts are among the most significant threats to coastal regions globally. Research consistently shows that the primary drivers of sea level rise pose severe risks to

low-lying coastal areas (Dawson et al., 2018). Studies by the Intergovernmental panel on Climate Change (IPCC) highlight that as sea levels rise, coastlines experience increased flooding, erosion, and salinization of fresh water resources, affecting agriculture, drinking water supplies, and infrastructure (Oppenheimer & Glavovic, 2022).

In Southeast Asia and pacific, where many coastal communities rely on the ocean for their livelihoods, leading to economic, social, and ecological challenges. Studies point to a positive feedback loop: as ecosystems such as mangroves and coral reefs, which buffer coastlines from storms and erosion, are degraded by climate change, coastal vulnerability is further intensified (Trégarot et al., 2024). Localized studies in countries like Indonesia show that rural and urban communities alike are already facing resource scarcity, with adaptation efforts lagging the accelerating pace of environmental change (Rejekiningrum, 2014). Together, these findings underscore the urgent need for region-specific adaptation strategies that address both immediate and long-term coastal vulnerabilities.

The concept of climate change as a security threat has gained increasing attention in recent year (Boyer & Oculi, 2019). Theories linking climate change to security emphasize that environmental stressors such as extreme weather events, rising sea levels, and resource scarcity can destabilize societies by exacerbating economic disparities and intensive coastal competition. In Indonesia, a nation with thousands of islands and extensive coastal populations, climate-related security risks are particularly critical. Rising seas threaten to displace coastal communities, which may lead to mass migrations and tensions in urban areas unprepared for such demographic shifts. Saltwater intrusion and flooding undermine agricultural productivity and freshwater availability, posing risks to food and water security. Security experts argue that climate-driven impacts can strain government resources, weaken institutional capacity, and heighten vulnerabilities to conflict and organized crime in affected areas. The ASEAN region, where many countries share maritime borders, is also sensitive to these cascading risks, as disruptions in one area can affect trade, migration, and political stability across the region (Boas, 2015). Indonesia's experience underscores the need for regional, multi-level response to climate security that includes stronger climate adaptation, disaster preparedness and resource management policies to mitigate the destabilizing effects of climate change (Indonesia's Government, 2021).

Several scholars discussed the impact of climate change on security in Southeast Asia region. Caballero-Anthony et.al (2023) explore how climate change exacerbates environmental, economic, and security challenges in the region, with a focus on resource conflict, climate-induced migration, and coastal areas. Caballero-Anthony et.al highlights the need for stronger regional cooperation and integrated strategies to mitigate climate risks and safeguard peace and stability in ASEAN. While it may provide an overview the human security threat posed by climate change, the book lacks a detailed examination of localized impacts on specific coastal communities in Southeast Asia. There is a need to understand how different coastal areas, depending on geography, socio-economic conditions, and governance structures, experience varying levels of vulnerability to climate-related threats.

UNDP Policy Brief on the climate security nexus explores the connection between climate change and violent extremism, identifying climate changes as a significant "risk multiplier" in fragile regions (Wong et al., 2020). This linkage operates through several mechanisms which climate change depletes resources and destabilises livelihoods, it can exacerbate grievances, weaken governance, and fuel conflict over scarce resources.

For some countries, environment and maritime domain can be seen as trigger for conflict and competition specifically for controlling over valuable resources and strategic territories. Disputes over fishing grounds, claimed waters, artificial islands, and the exploitation of marine resources can

elevate tensions and confrontations between countries (González Levaggi, 2023). However, environment and maritime domain also can produce cooperation among nations (Nagy, 2024).

Climate change is classified as non-traditional security which basically a positive sum game that motivates countries in Southeast Asia to cooperate (Prayoga, 2022). Shared environmental threats, such as pollution, climate change and protecting of marine biodiversity, demand collective actions not only among countries but also public. Environmental degradation can lead several threats to national survival and human security (Ali & Shah, 2023). By working together on environmental sustainability of marine resources, countries can build trust, strengthen diplomatic ties, and create frameworks for peaceful coexistence. Therefore, while environmental and maritime domain may lead to competition, both also offer opportunities for countries to address common challenges and potential conflicts into areas for cooperation on environmental security.

Other scholar focuses on environmental security and highlights some approaches such as focusing on environmental management (Peou, 2021). Environmental management has gained increasing attention as regional institutions like the Association of Southeast Asian Nations (ASEAN) take on a more active role in addressing global environmental problems which reflected in Socio Cultural Community (ASCC). By participating in global initiatives, ASEAN not only contributes to the global dialogue on sustainability but also enhances its member states' capacities to mitigate climate change. This collective approach allows ASEAN to implement more comprehensive strategies that address both unique environmental concerns of the region and global challenges. Through collaborative efforts, including sharing best practices on mitigation and adaption, conducting joint research, and cultivating regional partnership, ASEAN underscores the importance in achieving economic growth, social development, and environmental sustainability.

Impact of Climate Change on Banyuwangi's Coastal Regions

Banyuwangi, located on the eastern part of Java Island, Indonesia, is highly vulnerable to impacts of climate change due to its extensive coastline 175.8 km and proximity to the Indian Ocean (Umilia & Mahendra, 2022)(Regency Official Website, n.d.). This coastal district faces increasing risks from sea level rise, coastal erosion, and more frequent extreme weather events, including intense rainfall and storms (Saksono, 2024). As sea levels rise, low-lying areas in Banyuwangi are prone to regular flooding, threatening homes, agricultural lands, and vital infrastructure. Also, saltwater intrusion into freshwater sources compromises water quality and agricultural productivity, endangering local food security and livelihoods, particularly for fishing and farming communities (Muchamad et al., 2017). Banyuwangi's geographic position, coupled with limited adaptive resources, heightens its vulnerability, making it susceptible not only to environmental degradation but also to economic and social instability. The combination of these challenges underscores the urgent need for comprehensive climate adaptation measures to safeguard Banyuwangi's natural resources, economy, and residents.

The coastal region of Banyuwangi faces significant challenges from both current and projected sea-level rise, driven by the accelerating impacts of climate change. Rising seas have led to increased flooding, coastal erosion, and saltwater intrusion, threatening vital agricultural lands and freshwater resources. Communities along the coast are already experiencing disruptions to their livelihoods, particularly in fisheries and tourism, which are essential economic for the region (Zulianto et al., 2020). Projections indicate that if sea levels continue to rise at the current rate, low-lying areas in Banyuwangi could face permanent inundation, displacing thousands of residents, and endangering critical infrastructure (Erwanto et al., 2021a). These changes also pose a threat to the region's unique ecosystems, including pine tree, mangroves, and coral reefs, which act as natural barriers against storm surges. Addressing

these challenges requires urgent and coordinated efforts to implement adaptive measure that protect both human and environment systems in Banyuwangi's coastal zones.

The socio-economic consequences of climate change for coastal communities in Banyuwangi are profound, affecting livelihoods, health, and overall well-being. The region's dependence on fisheries and agriculture has made these communities particularly vulnerable to disruptions caused by rising seas and erratic weather patterns. Coastal erosion and saltwater intrusion have reduced agricultural productivity, threatening food security and income for farmers. Meanwhile, declining fish stocks due to warming seas and habitat degradation have impacted the livelihoods of fisherfolk (Badjeck et al., 2010), forcing some to seek alternative, often less stable, sources of income (Fatimah, 2014). Tourism, another vital economic sector, has also been affected as beach erosion and environmental degradation reduce the region's appeal to visitors (Phillips & Jones, 2006). Some coastal areas in Banyuwangi, including Camara Beach, are affected by beach erosion (Erwanto et al., 2021b). Beyond economic losses, these changes exacerbate social inequality, as marginalised groups often lack the resources to adapt or recover. Without effective intervention, those socio-economic challenges could deepen poverty and force migration, further straining the resilience of coastal communities in Banyuwangi.

Environmental degradation and biodiversity loss in Banyuwangi's coastal zones are significant consequences of climate change and human activities. These ecosystems, which provide critical habitats for marine and terrestrial species, are being degraded at an alarming rate, leading to the loss of biodiversity, and disrupting ecological balance. The destruction of mangroves, for instance, not only reduces biodiversity but also weakens natural coastal defences against storms and flooding. Coral bleaching, driven by warming seas and pollution, has diminished fish population, threatening marine food chains and the livelihoods of local fishing communities. Furthermore, the expansion of urban and industrial activities along the coast has intensified habitat destruction and waste accumulation. This environmental degradation compromises the region's natural resilience, highlighting the urgent need for conversation and sustainable management efforts to protect Banyuwangi's rich biodiversity.

Adaptation Strategies in Banyuwangi

The local government in Banyuwangi has implemented several policies aimed at adapting to climate change and mitigating its impact on the coastal zone. Strategic spatial planning and zoning regulations have been introduced to restrict development in high-risk areas prone to flooding and erosion. Infrastructure projects, such as wave barriers and embankments, have been prioritised to protect coastal settlements and critical facilities (Manunggal, 2023). In several places in Banyuwangi, TetraPOT are applying for coral reef conservation (Abdurrahman et al., 2020). The government has promoted the integration of climate-resilient designs in urban development, ensuring that buildings and infrastructure can withstand extreme weather events. Public awareness campaigns and community engagement initiatives have also been launched to educate residents on the importance of sustainable land use and disaster preparedness. These proactive measures demonstrate the local government's commitment to balancing economic growth with environmental conservation.

Banyuwangi's communities have taken a leading role in climate adaptation through grassroots initiatives that address both environmental and economic challenges. One notable effort is the restoration of pine tree forest along the Camara Beach, which serves as natural barriers against strong winds and sea-level rise while also reducing erosion. Another successful initiative is Bangsring Underwater, a community-driven marine conservation program aimed at restoring coral reef and promoting sustainable tourism (Setiawan et al., 2022). Local fisherfolk have transformed damaged coral ecosystems into

vibrant underwater parks, attracting eco-tourists and divers while protecting marine biodiversity. Eco-tourism projects across Banyuwangi have further encouraged the preservation of natural resources, providing alternative income streams for residents, and fostering a sense of environmental stewardship. These initiatives showcase the power of community action in creating innovative, sustainable solutions to climate challenges.

Collaboration between the public and business has played a critical role in advancing Banyuwangi's climate adaptation strategies. State-owned companies (Pertamina and PLN) , in partnership with the local government, have invested in green infrastructure projects, such as renewable energy installations and eco-friendly tourism facilities (Rimawati, 2024) (Hidayatullah, 2024). These partnerships have not only enhanced the region's resilience to climate impacts but have also supported economic growth through job creation and sustainable business opportunities. Moreover, private sector, such as PT. BSI, involvement in mangrove restoration and reforestation efforts has provided funding and expertise to scale up these projects (Rinanda, 2024). Corporate social responsibility (CSR) programs have also been instrumental in raising awareness and mobilizing resources for climate adaptation at the community level. By leveraging the strengths of both sectors, Banyuwangi has demonstrated the importance of inclusive and collaborative approaches to building resilience in the face of climate change.

Banyuwangi's climate adaptation strategies present a mix of strengths, weaknesses, opportunities, and threats. Among its strengths are the community-driven initiatives which showcase the power of grassroots engagement in creating sustainable solutions. The local government's commitment to integrating environmental conservation with economic development further strengthens its approach. However, weaknesses remain, including limited financial resources and the uneven enforcement of zoning and environmental policies. Opportunities for Banyuwangi lie in scaling up eco-tourism and leveraging public-private partnerships to attract further investment. On the other hand, threats such as rapid urbanization, environmental degradation, and the intensifying effects of climate change pose significant challenges. Addressing these weaknesses and threats will be crucial for the long-term success of Banyuwangi's adaptation efforts.

Coastal communities, based on the strength side, and local actors in Banyuwangi have played a pivotal role in driving climate adaptation efforts. By leveraging traditional knowledge and fostering a sense of ownership, these communities have successfully implemented initiatives like mangrove restoration and sustainable fishing practices. Local leaders and community-based organizations have also been instrumental in raising awareness about climate risks and mobilizing collective action. Programs such as Bangsring Underwater have demonstrated how local actors can transform environmental challenges into opportunities for economic growth, such as through eco-tourism. The involvement of local stakeholders ensures that adaptation strategies are contextually relevant, socially inclusive, and more likely to be sustained over time.

To scale and replicate Banyuwangi's successful climate adaptation strategies, several key recommendations can be made. First, creating knowledge-sharing platforms can help disseminate lessons learned and best practices to other coastal regions in Indonesia. This could include workshops, conferences, and digital tools that connect local governments and communities. Second, securing financial support through national and international funding mechanisms is essential for expanding programs like mangrove restoration and coral reef conservation. Third, fostering multi-stakeholder collaboration that includes government, private sector, and local communities can enhance resource mobilization and implementation capacity. Lastly, integrating climate adaptation into broader regional and national development plans will ensure that successful strategies are institutionalized and scaled effectively. These recommendations can help amplify the impact of Banyuwangi's initiatives and strengthen Indonesia's overall climate resilience.

Impacts on Indonesia's Climate Resilience

Banyuwangi's efforts in addressing climate change contribute to Indonesia's national adaptation goals, particularly in enhancing coastal resilience and sustainable development. By implementing innovative policies and community-driven initiatives, Banyuwangi serves as a model for integrating environmental conservation with socio-economic growth. The restoration of mangroves, coral reefs, and coastal ecosystems aligns with Indonesia's commitment to climate resilience under its Nationally Determined Contributions (NDCs) to the Paris Agreement. Moreover, Banyuwangi's success in promoting eco-tourism and sustainable fisheries demonstrates how local adaptation strategies can support broader national objectives, such as reducing greenhouse gas emissions and improving livelihoods. These achievements underline the importance of localised actions in achieving Indonesia's overarching climate adaptation goals.

The experiences and outcomes of climate change adaptation strategies in Banyuwangi offer valuable lessons for other regions across Indonesia. On key takeaway is the importance of community engagement in developing and implementing sustainable solutions. The people of Banyuwangi have employed a range of adaptation strategies that address both the environmental and socio-economic impacts of climate change.

Key initiatives include the restoration of mangrove forests, the implementation of sustainable fishing practices, and the development of eco-tourism projects like Bangsring Underwater. Mangrove restoration projects not only act as natural barriers against coastal erosion and storm surges but also serve as carbon sinks, contributing to climate mitigation efforts. Sustainable fishing practices have helped rebuild fish stocks and ensure food security, while eco-tourism has created alternative livelihoods, reducing dependence on traditional, climate-sensitive industries.

Community-driven pine tree restoration along coastal areas, including Cemara Beach, has mitigated the effects of strong winds and reduced soil erosion and protecting agricultural lands. Local zoning policies and disaster preparedness training have also enhanced the community's capacity to respond to extreme weather events. These strategies collectively contribute to Indonesia's resilience by safeguarding vulnerable coastal areas, reducing poverty through diversified income sources, and fostering environmental stewardship among local populations. Banyuwangi's success exemplifies how localised actions can align with national adaptation goals and strengthen Indonesia's ability to withstand and recover from climate impacts.

Grassroots initiatives, such as Bangsring Underwater and Camara Beach, highlight the role of local communities as active agents of change, rather than passive recipients of aid. Besides, Banyuwangi demonstrates the effectiveness of combining traditional ecological knowledge with modern technology to address complex climate challenges. Regions facing similar risks can adopt Banyuwangi's approaches, tailoring them to their unique environmental and socio-economic contexts. Sharing these best practices through inter-regional collaboration can strengthen Indonesia's overall capacity to adapt to climate change.

Banyuwangi's adaptation strategies underscore the need for integrated coastal management policies that balance environmental conservation with economic development. Policymakers must prioritise the protection and restoration of natural ecosystems, such as mangroves and coral reefs, which provide critical services to coastal communities. Zoning regulations and spatial planning should consider the long-term impacts of sea-level rise, ensuring that infrastructure and settlements are designed to withstand future risks. Moreover, Banyuwangi's success highlights the importance of fostering public-private partnerships to mobilise resources and expertise for sustainable development. National and

local governments can draw on Banyuwangi's experience to create comprehensive policies that address the interconnected challenges of climate adaptation, economic resilience, and social equity in Indonesia's coastal regions.

ASEAN Frameworks Addressing Environmental Security

Banyuwangi's community-driven climate adaptation efforts strongly align with ASEAN's commitment to a people-centred and people-oriented community, particularly in achieving environmental security. At the core of ASEAN's people-centred approach is the belief that solutions to regional challenges, such as climate change, must prioritize the needs, aspirations, and active participation of local communities. Banyuwangi exemplifies this by placing communities at the forefront of its adaptation strategies, empowering them to be agents of change in addressing environmental challenges.

For example, initiatives like mangrove restoration and Bangsring Underwater demonstrate how local people can contribute directly to environmental security while improving their own livelihoods. These projects emphasize community participation in decision-making, implementation, and benefit-sharing, ensuring that the strategies are sustainable and rooted in local needs. By creating alternative income sources such as eco-tourism, Banyuwangi provides economic stability while reducing environmental degradation, addressing two critical pillars of ASEAN's vision for sustainable development.

Furthermore, Banyuwangi's success showcases how empowering local actors fosters resilience and strengthens social cohesion—essential elements of a people-centred ASEAN. When local communities are directly involved in solving climate-related issues, they become stakeholders in preserving environmental security not only for their region but for the broader ASEAN community. This approach aligns with ASEAN's Blueprint 2025, which emphasises inclusive regional growth and sustainable development driven by active citizen participation. The lessons from Banyuwangi provide a replicable model for other ASEAN nations to adopt, reinforcing the principle that a people-centred approach is key to achieving long-term environmental security and stability across Southeast Asia.

With Banyumas, Banyuwangi Regency has been recognised as participant in the Smart Green Cities (SGAC) development program (Kenzu, 2023). This initiative, supported by the United Nations Capital Development Fund (UNCDF), aims to promote sustainable and environmentally friendly urban development across the ASEAN region. As part of this program, Banyuwangi has the opportunity to showcase its commitment to sustainability and innovation, further solidifying its position as a leader in climate adaptation and green development.

Since Southeast Asia people live in many islands, it is crucial for the grouping to have response to the climate change impacts maritime sectors such as fishing activities, tourism, and living space in the coastal area. The capture fisheries sector is quite vulnerable to the change of habitat and temperature. Furthermore, coastal communities in Southeast Asia already experiencing direct climate change impacts from changes in temperature, sea-level rise, ocean warming, and extreme weather conditions. This community is vulnerable due to their livelihood are influenced by climate change.

According to Secretariat, ASEAN member states (AMS) continue to balance among economic growth, environmental sustainability, and social development. AMS agreed to improve their capacities in promoting conservation and sustainable management and utilisation of marine and coastal ecosystem. These commitments can be seen at Declaration on ASEAN post-2015 Environmental Sustainability and Climate Change Agenda. Regional climate-related commitment is in line with global agenda on Paris Agreement to respond to climate change based on differentiation of national conditions. Paris Agreement acknowledged that economic growth, social development, poverty eradication, and environmental protection are essential for Southeast Asia countries (UNCC).

ASEAN countries are diverse in their levels of economic development, which affects their capacity to invest in climate change mitigation and adaptation plans (Lestari et al., 2024). Wealthier country within the grouping like Singapore can access more sophisticated and costly technologies to implement advanced and often expensive climate solutions. Such country can afford to adopt cutting-edge technologies for reducing carbon emissions, improving energy efficiency, and enhancing resilience to climate impact. On the other hand, less developed AMS such as Laos and Myanmar face greater challenges. These countries are often focused on addressing immediate response namely fulfilling basic infrastructure needs, ensuring access to clean water and electricity, improving healthcare services, and upgrading education systems. Their limited financial capabilities make it difficult to prioritise large-scale climate initiatives, even though they also vulnerable to the impacts of climate change. As a result, these nations may rely more on international aid, regional cooperation, and technology transfer to support their climate efforts.

The economic development gap among AMS plays significant role in shaping national priorities, often leading to decisions that do not fully align with regional climate agendas (Asian Development Bank, 2023). For many countries as well as AMS, the pursuit of economic growth, poverty alleviation, and political stability in many cases win over environmental protection as they can provide the immediate needs for their populations. The focus tends to be on using economic opportunities and improving living standards since large portions of the population may still struggle with poverty and lack access to basic service. The government will prioritise industrial development, infrastructure expansion, and natural resource exploitation over environmental sustainability. For example, a country heavily dependent on natural resources might utilise mining or logging to boost economic growth even though such agenda can contribute to climate change and lead to environmental degradation. Compared with wealthier ASEAN nations with more developed economies might have the capacity to integrate environmental considerations into their growth strategies.

Several ASEAN member states have economies that are heavily reliant on fossil fuels, both for domestic energy consumptions and as significant export product (Liu, Sheng, & Azhgaliyeva, 2019). Reliance on fossil fuels has been a driving force behind economic growth in these countries, providing affordable energy to power industries, support transportation, and meet the needs of rapidly urbanising populations. However, this dependence presents challenges when it comes to transitioning towards cleaner energy sources. Shifting to renewable energy sources is technically, economically, and politically challenging especially post COVID-19 pandemic. This natural disaster has drawn national budgets, increased debt levels, and enhanced economic recovery, thus making it difficult for governments to develop more advance renewable energy infrastructure. Moreover, the fossil industry is often deeply entranced in the political and economic landscape of these countries, with powerful stakeholders who may resist changes that could endangered their interests. Indeed, this creates a complex situation where the push for sustainable energy solutions must head-to-head with the immediate need to revive economies that were hit hard by the COVID-19 pandemic. Additionally, for countries that rely on fossil fuels as a major export product, the shift to renewables poses the risk of destabilising income from export, which are crucial for maintaining economic stability and funding social programs. Furthermore, these problems get more complicated by the global dynamics of fluctuating energy prices and the need to remain competitive in the international market. As a result, while there is growing recognition of the importance of renewable energy to combat climate change but the path to achieve this transition is fraught with economic obstacles.

In addition to economic challenges, the diverse political systems and governance structure chain effective regional coordination on climate change (Caballero-Anthony, 2011). The grouping is characterised by a wide spectrum of political regimes, ranging from

democracies to authoritarian states, each with its own decision-making processes, priorities, and government capabilities. It is obvious a challenge to implement unified policies or strategies for climate change among AMS. While ASEAN as a regional organisation promotes cooperation and collective action, the varying levels of political will, institutional capacity, and governance frameworks among its member states can interrupt the effectiveness of these effort. However, without strong regional coordination and alignment of national policies, these common responses risk creating fragmentation rather than synergy in ASEAN's overall climate strategy. The complex interplay of economic and political factors thus makes it clear that achieving a cohesive and effective regional approach to climate change requires not only economic adaptation but also significant political and institutional coordination.

At public level, the lack of awareness and engagement on environmental protection and climate change issues is a common challenge across Banyuwangi District. This lack of awareness is often rooted in a variety of factors, including limited access to education, poor media coverage, and the prioritisation of more immediate economic and social concerns over environmental issues. When the research team interviewed several respondents in Pangandaran and Banyuwangi Districts, especially in coastal areas, daily survival and economic stability are more worrying than abstract or long-term threats like climate change. People may not fully understand the impacts of environmental degradation or the urgency in environmental initiatives. The challenge is not just about raising awareness but also about fostering a sense of responsibility and empowering individuals and communities to act. Without significant improvements in public education and engagement, efforts to address environmental challenges in the region may fall short, as widespread public support and participation are crucial for the successful implementation of climate policies and the transition to a more sustainable future.

This is a crucial point to address when it became evident that daily survival and economic stability often overshadow concerns about long-term or abstract threats such as climate change. Many individuals lacked a full understanding of the impacts of environmental degradation or the urgency of environmental initiatives. This insight highlights a critical challenge for ASEAN's climate adaptation and resilience programs: the need to bridge the gap between immediate livelihood priorities and long-term environmental goals. ASEAN's people -centred approach to climate resilience should enhanced focus on raising awareness into prioritised fostering a sense of responsibility and empowering communities to take actionable steps. By aligning adaptation strategies with local socio-economic needs, such as creating sustainable livelihood opportunities or integrating environmental education into economic initiatives. ASEAN can ensure that climate resilience efforts resonate with ad benefit local populations while achieving regional sustainability objectives.

To effectively address the environmental challenges facing the region, ASEAN needs to enhance regional cooperation, improve capacity-building, coordinating national and regional policies, and secure adequate funding and technology support. By strengthening regional cooperation, ASEAN can facilitate the sharing of resources, expertise, and best practices, enabling countries to address these problems more effectively and efficiently. Improving capacity-building is also crucial, as it empowers member states to develop the technical and institutional capabilities needed to implement and enforce environmental policies. This includes training government officials, raising public awareness, and encouraging research and innovation in sustainable technologies. Furthermore, coordinating national and regional policies is crucial to ensure that AMS contribute to the grouping goals and creating a cohesive strategy that increases impact. As many ASEAN countries may lack the financial resources or access to advance technologies needed to address environmental challenges. International partnerships, investments, and technology transfers can play a vital role in bridging these gaps.

ASEAN have agreement in implementing people-centred and people-oriented approaches which provides the importance of environmental and human security framework. This framework, guided by principle of "no one leaves behind," emphasises the need to consider the most vulnerable populations in climate actions and environmental protection efforts, ensuring that all segments of society benefit from sustainable development. By integrating these strategies, ASEAN can strengthen its collective resilience against environmental threats and work towards a future where environment, human well-being, and economic are safeguarded across the region. With all these condition and reasons, as the only organisation that successfully securing challenges from super powers competition, it is time for ASEAN to conduct a comprehensive action tackling climate change.

ASEAN has been actively engaging in cooperation on climate change, recognizing the region's vulnerability to its impacts and the need for collective action. At the 26th ASEAN Summit in Kuala Lumpur in 2015, leaders of ASEAN committed to build a community that resilient to disaster and climate change. On the Socio-Cultural Community 2025, ASEAN highlights several crucial points cooperation in terms of climate change mitigation and adaption. ASEAN is promoting cooperation to protect, restore, and sustainably use coastal and marine environments. This includes addressing pollution risks and threats to marine ecosystems and coastal areas, especially those that are ecologically sensitive. The organisation advocates for adaption of good management practices and the strengthening of policies to mitigate the impact of development projects on coastal and international waters, as well as transboundary environmental issues like pollution and the illegal movement and disposal of hazardous substances and waste. ASEAN encourages the use of existing regional and international institutions and agreements for these purposes. It also focuses on enhancing policy and capacity development, as well as best practices, to conserve, develop, and sustainably manage marine environments, wetlands, peatlands, biodiversity, and land and water resources.

Conclusion

Banyuwangi's community-driven adaptation strategies provide a compelling example of how localized, people-centered initiatives can effectively address the complex challenges posed by climate change while contributing to broader resilience and security goals. By empowering communities to lead efforts in mangrove restoration, sustainable fishing, and eco-tourism, Banyuwangi has demonstrated how grassroots innovation and inclusive participation can align with Indonesia and ASEAN priorities. These initiatives not only strengthen Indonesia's climate resilience but also advance ASEAN's vision of environmental security by promoting sustainable development, enhancing regional biodiversity, and fostering social cohesion.

Furthermore, Banyuwangi's emphasis on empowering local actors aligns with ASEAN's commitment to a people-centered community, where citizens actively contribute to shaping solutions that address shared environmental challenges. This approach underscores the importance of integrating local knowledge, inclusive decision-making, and sustainable livelihoods into climate adaptation strategies, ensuring their effectiveness and scalability. As a model for Indonesia and ASEAN, Banyuwangi's experience highlights the transformative potential of empowering communities to lead in achieving environmental security and resilience across the region.

Banyuwangi's experience in addressing climate change and its associated challenges underscores the critical need for integrated environmental and security policies in Indonesia and the broader ASEAN region. Rising sea levels, coastal erosion, and biodiversity loss threaten not only the ecological and socio-economic stability of local communities but also regional security. Banyuwangi's approach demonstrates that effective adaptation requires a combination of local innovation, government leadership, and multi-sectoral collaboration. By prioritizing ecosystem restoration, community empowerment, and sustainable development, Banyuwangi has set an example for managing climate risks while enhancing resilience. This

experience highlights the interconnectedness of environmental sustainability and security, emphasizing the urgency of addressing these issues holistically to protect both local livelihoods and regional stability.

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