

UNDERSTANDING AND MAPPING OF CLIMATE FINANCE INSTRUMENTS IN THE SOUTHEAST ASIA



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**ROSA
LUXEMBURG
STIFTUNG**
SOUTHEAST ASIA
MANILA OFFICE

**(CASE STUDIES OF INDONESIA,
MALAYSIA AND THE PHILIPPINES)**

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**Understanding and Mapping of Climate Finance Instruments in the Southeast Asia
(Experience of Indonesia, Malaysia and Philippines)**

is published by Rosa-Luxemburg-Stiftung

4th Floor Dusit Thani Manila, Ayala Center, 1223 Makati City, Philippines

www.rosaluxmanila.org

Editorial deadline: September 2022

Editing/Proofreading: Marjohara Tucay

Layout/Design: Nonie G. Florenda

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SUMMARY

In 2021, Southeast Asia faced significant natural disasters, including Hurricane Odette and Typhoon Rai in the Philippines, resulting in over 200 deaths, and major floods in eight Malaysian states. Indonesia is grappling with extreme heat waves forecasted until 2052, leading to increased forest fires and the risk of drought, impacting agricultural production. Additionally, Indonesia faces a 19-37% increase in sea level rise and coastal flooding from 2000 to 2030, highlighting the severe impacts of climate change that threatens development progress and could exacerbate global inequality.

Addressing this, climate finance becomes crucial for developing countries to adapt and mitigate climate change effects. Over a decade ago, developed nations pledged \$100 billion annually by 2020 for this purpose, as part of the Paris Agreement. However, by COP 26 in November 2021, this goal appeared unmet, with rich countries projected to allocate only between \$93 billion and \$95 billion annually by 2025. The shortfall forces vulnerable countries to rely on loans for climate resilience, increasing their debt burden and complicating transformative climate action. Most climate finance to Least Developed Countries (LDCs) and Small Island Developing States (SIDS) during 2017-2018 was in loans, not grants.

The report emphasizes that developing nations should not bear the debt to offset excess emissions from wealthier countries. It calls for fulfilling the \$100 billion climate finance commitment and improving the finance mechanisms for fairness, effectiveness, transparency, and accountability, crucial for enabling poor countries to reduce emissions and undertake significant climate actions.

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According to the United Nations Environment Program Finance Initiative (UNEP), the cost of adapting to climate change in developing countries is projected to be USD 140-300 billion annually by 2030, escalating to USD 280-500 billion by 2050. This underscores a significant funding disparity between developed nations and least developed countries, with the latter also bearing the brunt of environmental degradation historically caused by the former.

CHAPTER I

INTRODUCTION

Southeast Asia, an archipelago with 170,000 kilometers of coastline housing around 600 million inhabitants, faces significant climate change threats. Approximately 80% of its population resides within 100 km of the coast, areas increasingly prone to flooding due to the sea level rising by 1 to 3 millimeters annually, projected to reach 70 centimeters by 2100. This region, heavily reliant on agriculture with nearly 43% of its populace engaged in farming, can witness up to a 50% reduction in agricultural yields attributed to a potential increase in air temperature up to 4.8°C by 2100. This climatic shift threatens to transform forest areas into savannas, exacerbating the vulnerability of Southeast Asia to climate change.

The economic toll on Southeast Asia is substantial, with the McKinsey Global Institute estimating climate change mitigation costs to reach 6%-7% of the region's Gross Domestic Product (GDP). Specifically, Indonesia, Malaysia, and the Philippines could see expenses ranging between 8% and 13% of GDP by 2050. The financial strain is compounded for countries categorized as Least Developed Countries (LDCs) within the region, lacking adequate resources to address climate challenges effectively.

According to the United Nations Environment Program Finance Initiative (UNEP), the cost of adapting to climate change in developing countries is projected to be USD 140-300 billion annually by 2030, escalating to USD 280-500 billion by 2050. This underscores a significant funding disparity between developed nations and LDCs, with the latter also bearing the brunt of environmental degradation historically caused by the former. The 26th Climate Change Conference (COP 26) in Glasgow, Scotland, in November 2021 highlighted the urgent need for developed countries to fulfill their unmet financial commitment of providing USD 100 billion per year since 2020 to LDCs. The failure to secure adequate climate finance from developed countries has impeded the ability of nations like Indonesia, Malaysia, and the Philippines to meet their respective emissions reduction targets.

1. OBJECTIVES

This report examines the complex issue of climate finance, focusing on the unmet commitments by developed countries to poor and developing nations in Southeast Asia, specifically Indonesia, Malaysia, and the Philippines. It aims to:

1. Analyze the impact of unfulfilled climate finance commitments on Indonesia, Malaysia, and the Philippines.
2. Review climate finance strategies and policies in these countries following the shortfall of promised funds.
3. Outline the climate finance instruments framework in Indonesia, Malaysia, and the Philippines.
4. Examine the consequences of debt-increasing climate finance schemes for developing countries.

The report targets civil society, governments of developed countries and LDCs, and academics, highlighting the importance of understanding, evaluating, and supplementing climate finance strategies and policies.

2. DATA AND METHODOLOGY

This study investigates climate finance dynamics and emissions trading in Southeast Asia, focusing on Indonesia, the Philippines, and Malaysia, using a descriptive-analytic method with a qualitative approach. It is a literature study based on secondary data from research publications, laws and regulations, planning documents, media articles, and more. An analysis matrix was created from the data, leading to descriptive analysis aligned with the research questions. The study's validation was through peer reviews from knowledgeable and experienced individuals.

3. GUIDELINE OF WRITING OF REPORT

This study aims to provide an overview of the climate finance framework within Southeast Asia, systematically arranged into four comprehensive chapters.

The initial chapter delves into the multifaceted impacts of climate change and the finance mechanisms addressing these challenges in Southeast Asia. It broadens the discussion to encompass the global climate finance architecture, highlighting the fiscal frameworks to combat climate change worldwide.

The subsequent section pivots to the specifics of climate finance within Southeast Asia, focusing on the experiences of Indonesia, Malaysia, and the Philippines. It provides a synthesis of the evolution of climate finance and outlines the regional framework, detailing the diverse sources of funding, both public and non-public, across these nations.

In the third chapter, the study critiques the current trajectory of climate change finance development, spotlighting issues such as the exacerbation of debt burdens, the pitfalls of counterfeit carbon offset solutions, and the imbalance favoring mitigation finance over adaptation finance.

The report concludes by underscoring the policy implications and future directives essential for bolstering climate finance in the region. It advocates for enhancing governmental roles, strategically allocating public funds, and dynamically mobilizing non-public resources. Emphasizing the need for optimizing public funds and tapping into the vast potential of non-public funding, the study envisions a more robust framework for climate finance, integral to green budgeting agendas and supportive regulations for fund mobilization.

The results of this study aim to present an updated and coherent picture of the current status and progress in climate change funding within Indonesia, Malaysia, and the Philippines, calling for more concerted efforts to evolve a sustainable and effective climate finance framework.

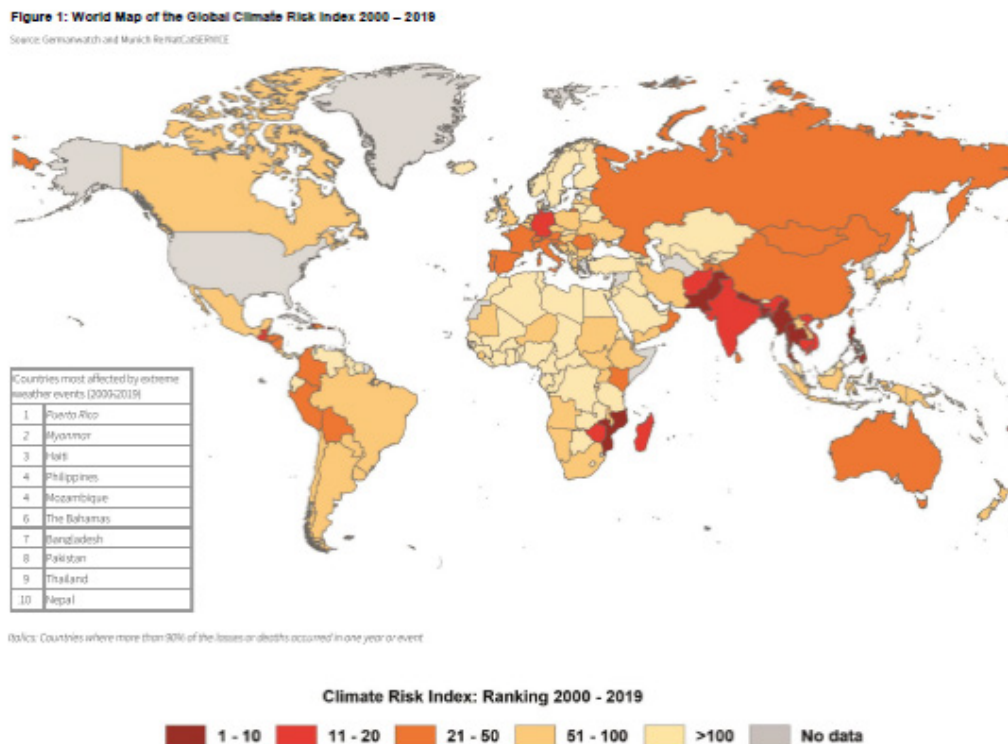
CHAPTER II

IMPACT OF CLIMATE CHANGE IN SOUTHEAST ASIA

Southeast Asia's vulnerability to climate change is significant, with increasing temperature, decreasing rainfall, and rising sea levels observed from 1951 to 2000. Indonesia, the Philippines, Thailand, and Vietnam face drier conditions and a potential 50% decline in rice yields by 2100, alongside a transformation of forests into tropical savanna with limited carbon sequestration capabilities (Asian Development Bank, 2009, p. xxii).

The climate change vulnerability index highlights the region's susceptibility to extreme weather events (Yusuf, A. and Francisco, H, 2009, p. 6). Economic impacts are severe, with estimated GDP losses by 2100 for Indonesia, the Philippines, Thailand, and Vietnam at 6.7%, and broader Southeast Asia facing 8%-13% GDP losses by 2050 due to heat and humidity (Asian Development Bank, 2009, p. xxii; McKinsey, 2020, p. 12).

Figure 2.1: World Map of the Global Climate Risk 2000-2019



Source: *Global Climate Risk Index (2021)*

Historical data from 2000-2019 shows substantial GDP losses per unit due to climate change and varying impacts across countries (Beirne, Renzhi, & Volz, 2021, pp. 4-5). The Global Climate Risk Index 2021 ranks countries based on their loss per unit of GDP, highlighting the differential impacts within the region (Eckstein, Kunzel, & Schafer, 2021, pp. 42-47). These findings underscore the urgent need for targeted climate action to mitigate these risks.

Table 2.1: Impacts of Climate-Related Natural Disasters in ASEAN Countries, 2000-2019

Country	Total Deaths (Average 2000-2019)	Total People Affected (Average 2000-2019)	Total Losses in Million US\$ (Average 2000-2019)	Total Losses as Share of GDP in % (Average 2000-2019)*	Number of Events (Total 2000-2019)
Cambodia	42	646,601	54.46	0.44	24
Indonesia	30	37,010	44.78	0.01	189
Loa PDR	14	177,989	22.85	0.27	20
Malaysia	4	65,377	30.19	0.01	47
Myanmar	3,489	158,644	104.62	0.27	40
Pilippines	83	522,994	76.23	0.04	273
Thailand	31	941,647	574,33	0.19	82
Vietnam	34	268,182	135.4	0.11	142

Source: John Beirne, Nuobu Renzhi dan Ulrich Volz (2021)

Note: No events were reported for Brunei Darussalam or Singapore between 2000 and 2019. Numbers for total deaths and people affected are rounded. *These numbers are not weighted by GDP/year but by the average of total losses in a million US\$ by the GDP average between 200 and 2019.

Meanwhile, in terms of the ranking of losses per unit of GDP. The Global Climate Risk Index in 2021 places Thailand at 17th, Myanmar at 19th, Cambodia at 28th, the Philippines at 31st, Laos at 38th, Vietnam at 47th, Malaysia at 104th, Indonesia at 115th, then Singapore at 177th and Brunei Darussalam at 179th.(Eckstein, Kunzel, & Schafer, 2021, pp. 42-47).

Table 2.2: Climate Risk Index for 2000 to 2019

Country	CRI Rank	CRI Score	Average Fatalities 2000-2019 (Rank)	Average Fatalities per 100.000 Inhabitants 2000-2019 (Rank)	Average Losses in million US\$ (PPP) 2000-2019 (Rank)	Average Losses per unit GDP in % 2000-2019 (Rank)
Myanmar	2	10,00	1	1	19	19
Philippines	4	18,17	7	16	8	31
Thailand	9	29,83	22	60	3	17
Vietnam	13	35,67	15	47	11	47
Cambodia	14	36,17	38	35	53	28
Laos	52	60,50	82	66	73	38
Indonesia	72	74,00	14	91	18	115
Malaysia	116	105,67	64	108	66	104

Country	CRI Rank	CRI Score	Average Fatalities 2000-2019 (Rank)	Average Fatalities per 100.000 Inhabitants 2000-2019 (Rank)	Average Losses in million US\$ (PPP) 2000-2019 (Rank)	Average Losses per unit GDP in % 2000-2019 (Rank)
Brunei D	176	130,17	167	151	178	179
Singapore	179	172,00	172	172	162	177

Source: Global Climate Risk Index (2021)

2.1. ECONOMIC IMPACT

The economic toll of climate change has led Southeast Asian nations to set ambitious emission reduction targets for 2050: Indonesia aims for a 29% reduction independently and 41% with global support; Malaysia targets a 45% reduction, with 35% from domestic efforts and 10% reliant on international aid; and the Philippines commits to a 75% reduction from 2020 to 2030, with only 2.71% expected to be achieved through domestic efforts. Achieving these targets necessitates substantial funding, which is challenging without global cooperation, as underscored by The Kyoto Protocol and The Paris Agreement, which advocate for wealthy nations to support economically disadvantaged and vulnerable countries.

Despite a collective pledge by developed countries to provide \$100 billion annually in climate finance from 2020 to 2025, the actual support has fallen short, with the OECD reporting only \$79.6 billion in 2019 and Oxfam estimating a potential annual contribution of \$93 billion to \$95 billion until 2025.

This funding shortfall compels Southeast Asian countries to rely heavily on domestic finance, jeopardizing their climate change responsiveness and raising concerns over potential debt traps. Indonesia, needing \$322.86 billion by 2030 for climate finance, reports that 66% of this is covered by the government budget, with the remainder from international public funding, predominantly in loans. Malaysia identified a need for RM33.5 billion to meet its emission reduction goal, but the government could only allocate RM7.24 billion. The Philippines, requiring \$5.59 billion for climate resilience until 2030, had allocated \$1.576 billion between 2004 and 2009, with minimal international support.

From 2015 to 2019, Indonesia spent \$55.01 billion on climate finance, mainly from its budget and minor contributions from foreign grants through the UNFCCC mechanisms such as the Adaptation Fund, GEF, and GCF. Loans from Japan, IBRD, and ADB constitute the major part of its climate funding. Indonesia has also explored financial instruments like green sharia bonds, issuing \$1.25 billion in 2018 and \$750 million in 2019, alongside a \$2.5 billion global sharia bond in 2020 and €500 million in SDG bonds in 2021.

Malaysia, facing a substantial financing gap in its renewable energy sector, which requires RM33.5 billion by 2025 but only has RM7.24 billion allocated by the government, has turned to innovative funding sources. Policies such as the Capital Market Masterplan 2, the Sustainable

and Responsible Investment Sharia Bond Framework, and the Sustainable and Responsible Investment Roadmap (2019-2025) have been introduced to bridge this gap.

An ADB study warns that ignoring climate change could cost the Philippines 6% of its GDP annually by 2100, highlighting the critical need for investment in climate resilience.

CHAPTER III

GLOBAL CLIMATE FIANNCE ARCHITECTURE

The Southeast Asian region’s significant losses due to climate change underscore the necessity for substantial funding, which is challenging to secure through solely local and national sources. International cooperation is essential, as outlined by The Kyoto Protocol and The Paris Agreement. These agreements emphasize the responsibility of developed countries to support poorer and developing nations by mobilizing climate finance from diverse sources, aiming for a progressive increase beyond previous efforts. Specifically, The Paris Agreement and a subsequent COP decision aim to elevate funding from a baseline of USD 100 billion annually by 2020, focusing on addressing the needs of developing countries (UNFCCC, 2015; UNFCCC, 2016a, p. 8).

The global climate finance structure, as analyzed by Charlene Watson and Liyane Schalatek, outlines various channels for climate finance, including multilateral climate funds. Additionally, many developing countries have established regional and national funds to facilitate the receipt of climate finance. By December 2020, notable contributions came from three sub-national governments and cities, totaling USD 70 million in pledges to the Green Climate Fund (GCF) and Adaptation Fund (AF), highlighting the diversity of finance mechanisms ranging from grants to private equity (Watson & Schalatek, 2021, p. 3).

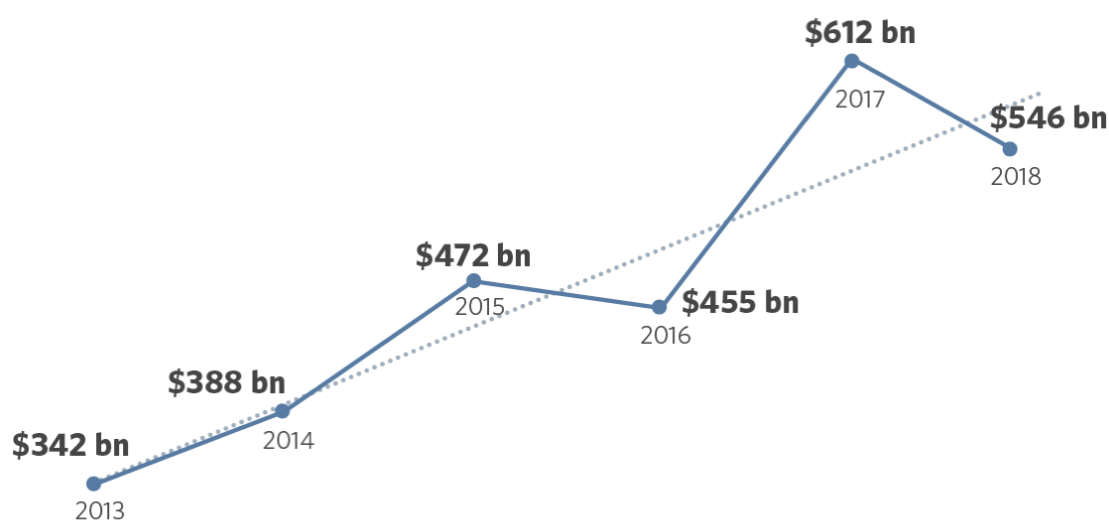
Figure 3.1: Global Climate Finance Architecture



Source: ODI (2017) www.climatefundsupdate.org

The Climate Policy Initiative (CPI) revealed that climate finance surpassed the USD half-trillion mark in 2017 and 2018, hitting annual averages of USD 579 billion, marking a 25% increase (or USD 116 billion) from the previous 2015/2016 period. A peak of USD 612 billion in 2017 was attributed to renewable energy investments in China, the U.S., and India, alongside enhanced public backing for land use and energy efficiency. However, 2018 saw an 11% decline to USD 546 billion, influenced by regulatory changes in the East Asia & Pacific region, a global economic slowdown, and falling renewables costs, which dampened investment in low-carbon transport and private renewable energy sectors (Buchner et al., 2019, p. 2).

Figure 3.2: Total global climate finance flows, 2013-2018



Source: Climate Policy Initiative (2019)

3.1. GLOBAL CLIMATE CHANGE FISCAL FRAMEWORK

The United Nations Framework Convention on Climate Change (UNFCCC) employs financial mechanisms to provide climate finance to developing countries through entities like the Global Environment Facility (GEF), Adaptation Fund (AF), and Green Climate Fund (GCF). The GEF has been a key financial mechanism since 1991, managing the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). Established under the Kyoto Protocol in 2001, the Adaptation Fund supports climate adaptation efforts. In 2010, the UNFCCC initiated the Green Climate Fund at COP-16.

3.1.1. GLOBAL ENVIRONMENT FACILITY (GEF)

GEF, a multilateral funding mechanism, offers incremental financing to catalyze existing programs for global environmental benefits. Its climate change mitigation funding under GEF-6 supports developing countries' transition to low-emission development, focusing on innovation, technology transfer, and broad-impact environmental strategies. GEF's adaptation funding aims to enhance resilience in developing countries through comprehensive adaptation

measures. Projects funded by GEF align with national policies, fall within GEF's focal strategies, and receive approval from the GEF Operational Focal Point. GEF's project modalities include Full-sized Projects (FSP), Medium-sized Projects (MSP), Supporting Activities, Programmatic Approach, and Small Grants Program.

1. Adaptation Fund (AF)

The Adaptation Fund (AF) emphasizes climate adaptation activities sourced from 2% of Clean Development Mechanism (CDM) carbon transaction proceeds. Under the Kyoto Protocol, the CDM facilitates GHG emission reduction projects in developing countries, promoting sustainable development and climate change mitigation. The AF is accessible through accredited Implementing Entities: National (NIE), Regional (RIE), and Multilateral (MIE).

2. Green Climate Fund (GCF)

With significant commitment values, the GCF supports climate mitigation and adaptation activities in developing countries. Funding is evenly distributed between mitigation and adaptation, focusing on low-emission development and climate resilience improvements in vulnerable communities.

The mechanism for determining priority programs and funding eligibility criteria in the GCF is set by the Conference of the Parties (COP), with the Standing Committee on Finance (SCF) playing a crucial role in financial mechanisms. The UNFCCC's 2015 Paris Conference expanded the SCF's responsibilities to include implementing the Paris Agreement and enhancing engagement with climate finance stakeholders both within and outside the UNFCCC framework.

The SCF's responsibilities are fourfold: (1) aiding the COP in enhancing the coherence and coordination of climate finance delivery; (2) helping to streamline the UNFCCC's financial mechanism; (3) supporting financial resource mobilization for climate finance; and (4) aiding in the measurement, reporting, and verification of support to developing nations. Additionally, the SCF organizes an annual climate finance forum, advises on financial mechanisms, contributes expert input on financial mechanism reviews, and prepares biennial climate finance assessments.

Key actors in the GCF framework include the National Designated Authority (NDA), Accredited Entities (AE), and Executing Entities (EE), with the NDA acting as the country's representative and liaison with the GCF.

The GCF aims to catalyze climate finance for low-emission and climate-resilient development, seeking a paradigm shift in the global climate response. By 2020, the GCF targeted an allocation of USD 100 billion. It had mobilized USD 10.3 billion from 43 governments by January 2018 and, by May 2018, supported 76 projects worth USD 12.6 billion, estimated to reduce CO₂ emissions by 1.3 billion tonnes and enhance climate resilience for 217 million people (Sesotyaningtyas et al., 2021, p. 20). The mechanism for determining priority programs and funding eligibility criteria in the GCF is determined by the Conference of the Parties (COP),

assisted by the Standing Committee on Finance (SCF) in carrying out its functions related to financial mechanisms.

At the 2015 Paris Conference, the UNFCCC decided that the SCF would also implement the Paris Agreement and thus promote and improve relations and coordination with stakeholders related to climate finance both inside and outside the UNFCCC.

The SCF has four functions, namely: (1) assisting the COP in improving coherence and coordination in the delivery of climate change finance; (2) assisting the COP in rationalizing the UNFCCC financial mechanism; (3) support the COP in mobilizing financial resources for climate finance; (4) and support the COP in the measurement, reporting, and verification of support provided to developing countries.

In addition, the SCF also has the task of convening an annual forum on climate finance, providing guidance and designs for existing funding mechanisms in operation to the COP, providing expert input on periodic reviews of financial mechanisms, and preparing biennial assessments of climate finance overviews.

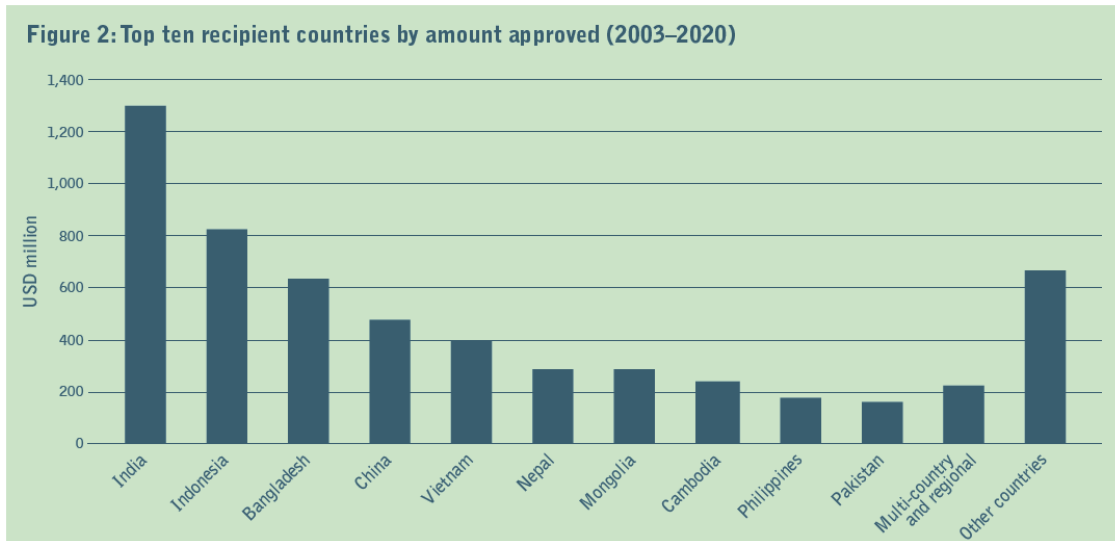
Three main actors have key roles in interacting with the GCF, namely the National Designated Authority (NDA), Accredited Entities (AE), and Executing Entities (EE). The NDA is the country representative who determines the program that will operate in that country and acts as a liaison between the proposer and the GCF.

The GCF catalyzes climate finance flows to invest in low-emissions and climate-resilient development, driving a paradigm shift in the global response to climate change. By 2020, the GCF has a planned allocation of USD 100 billion. As of January 2018, the GCF has raised USD 10.3 billion from 43 governments, mostly developed and some developing countries. As of May 2018, the GCF portfolio consists of 76 projects worldwide with a value of USD 12.6 billion, an estimated reduction of CO₂ emissions of approximately 1.3 billion tonnes, and increased climate resilience for 217 million people. (Sesotyaningtyas, et al., 2021, p. 20)

3.2. CLIMATE FINANCE IN SOUTHEAST ASIA

In 2020, 17 Asian countries received USD 5.7 billion for climate mitigation from multilateral schemes, covering 530 projects. A significant 86% of these funds were allocated to India and Indonesia, leaving countries like Sri Lanka with only USD 681 million despite their high vulnerability to climate change effects (Watson & Schalatek, 2021, pp. 1-3). Bilateral climate finance – such as the Indonesia-Norway REDD+ cooperation that aimed to reduce emissions from deforestation – has faced challenges, exemplified by Indonesia terminating the agreement on 10 September 2021 due to unmet Result Based Payment (RBP) obligations by Norway for Indonesia's 11.2 million tons CO₂eq emission reduction in 2016/2017 (Kementerian Luar Negeri, 2021).

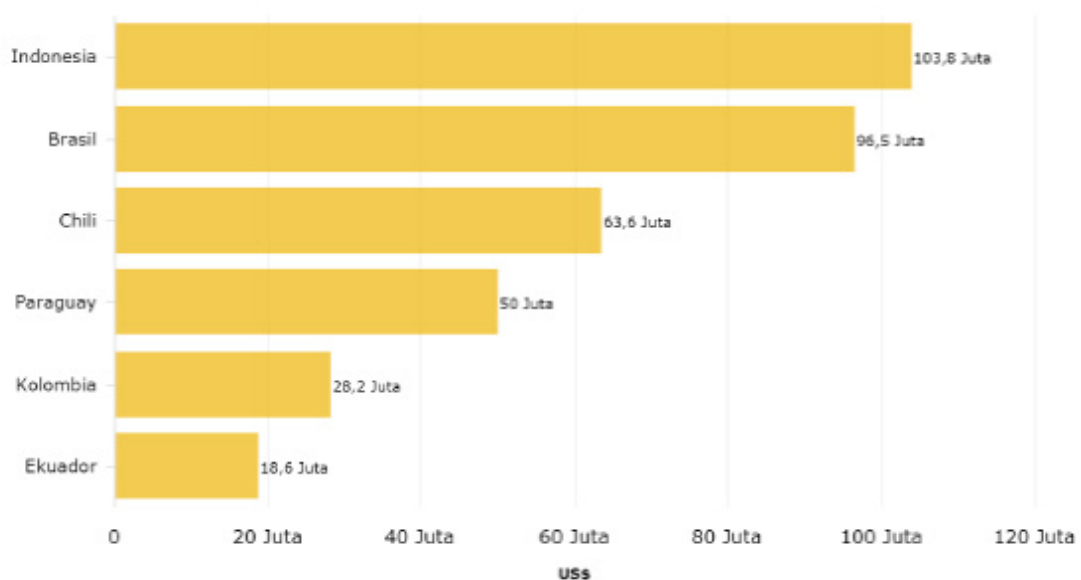
Figure 3.3: Top ten recipient countries by amount approved (2003-2020)



Source: Charlene Watson and Liane Schalatek (2021)

REDD+ financially incentivizes countries to conserve forests, targeting deforestation-prone nations like Indonesia and Brazil. Following its 26% greenhouse gas emission reduction commitment by 2020, Indonesia was to receive RBP funds from Norway at US\$ 5 per tonne of CO₂, amounting to US\$ 56 million for the 11.2 million tons reduced in 2016/2017. However, Norway had not paid these funds by the end of 2020. Despite this, Indonesia remains the top beneficiary of the GCF through REDD+, receiving USD 103.8 million for reducing emissions by 20.3 million tons in the 2014-2016 period, outpacing Brazil, Chile, and Paraguay (Maesaroh, 2021).

Figure 3.4: Funding from a Payments Scheme based on REDD+ Results



Source: Katadata.co.id (2020)

Climate resilience in Southeast Asia can be financed from various sources, including government budgets, climate funds, and green bonds. International agreements like the Kyoto Protocol and the Paris Agreement encourage support from wealthier nations to more vulnerable countries. The ASEAN Green Bond Standards (AGBS), based on the ICMA Green Bond principles, guide the issuance of green bonds in the region, promoting transparency and excluding fossil fuel projects.

CHAPTER IV

CLIMATE CHANGE FINANCE FRAMEWORK IN SOUTHEAST ASIA (Indonesia, Malaysia, and Philippines)

Southeast Asia, with a population of half a billion and a GDP of USD 3 trillion, faces potential economic losses due to climate change. A Deloitte report cited by CNBC.com predicts a loss of \$28 trillion over 50 years if carbon emissions are not significantly reduced, potentially decreasing annual GDP growth by 7.5%. Critical sectors, including services, manufacturing, and retail, could see declines, with these sectors making up 83% of the region's economic output (Jacob, 2021).

Deloitte suggests that proactive climate action in Southeast Asia could result in economic gains of \$12.5 trillion and an average GDP growth of 3.5% annually over the next 50 years. The Climate Change Performance Index (CCPI) 2022, by German Watch and others, evaluates countries' climate efforts, including greenhouse gas emissions reduction and renewable energy use. The CCPI 2022 ranked the Philippines, Indonesia, Thailand, Vietnam, and Malaysia, showing varied progress and challenges in their climate policies (Burck, Uhlich, Bals, Höhne, & Nascimento, 2022, p. 7).

Climate resilience in Southeast Asia can be financed from various sources, including government budgets, climate funds, and green bonds. International agreements like the Kyoto Protocol and the Paris Agreement encourage support from wealthier nations to more vulnerable countries. The ASEAN Green Bond Standards (AGBS), based on the ICMA Green Bond principles, guide the issuance of green bonds in the region, promoting transparency and excluding fossil fuel projects.

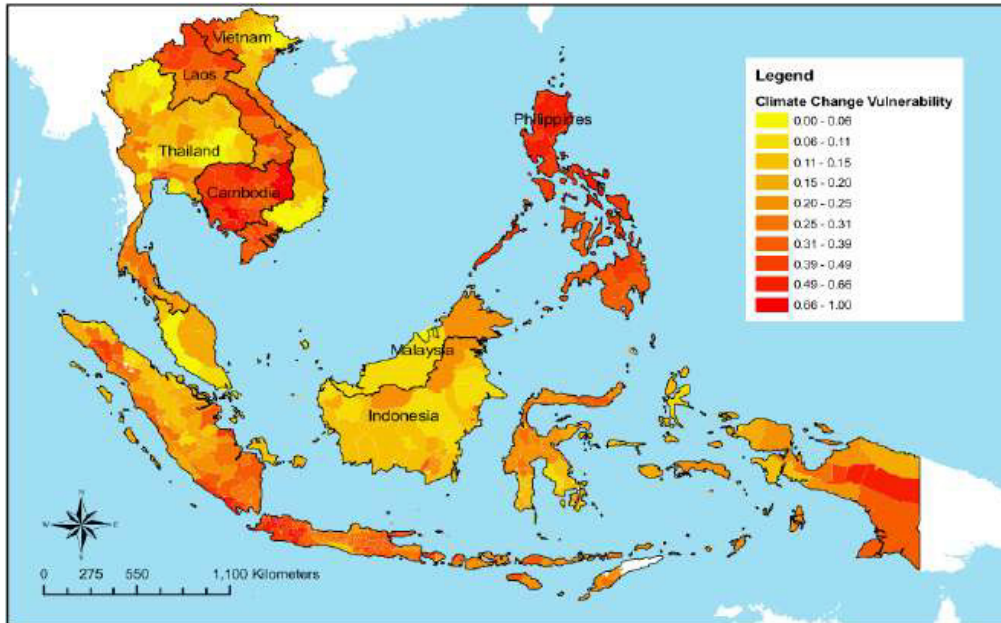
This chapter will review the sources, mechanisms for accessing, and the allocation of climate resilience funding in three Southeast Asian countries, namely Indonesia, Malaysia, and the Philippines. All parties must assess and understand how climate finance can be optimally mobilized in these three countries.

4.1. INDONESIA

Funding for climate resilience in countries like Indonesia can be sourced domestically through taxes and bond issuances or internationally via grants and loans. Indonesia's environmental degradation underscores its vulnerability to climate change, manifesting in shifts in temperature and rainfall patterns. Predictions indicate an increase in rainfall intensity (2-7%) and frequency (3-23%) by 2050, alongside more frequent heatwaves, glacier loss in Papua, delayed monsoons by up to 30 days, a slightly longer dry season, and a sea level rise of 150-450 mm by 2056 (USAID, 2017, pp. 2-3).

According to Yusuf and Francisco's climate change vulnerability index, Indonesia is highly susceptible to natural disasters like tropical cyclones, landslides, floods, droughts, and sea level rise, more so than other Southeast Asian nations (Yusuf & Francisco, 2009, p. 6).

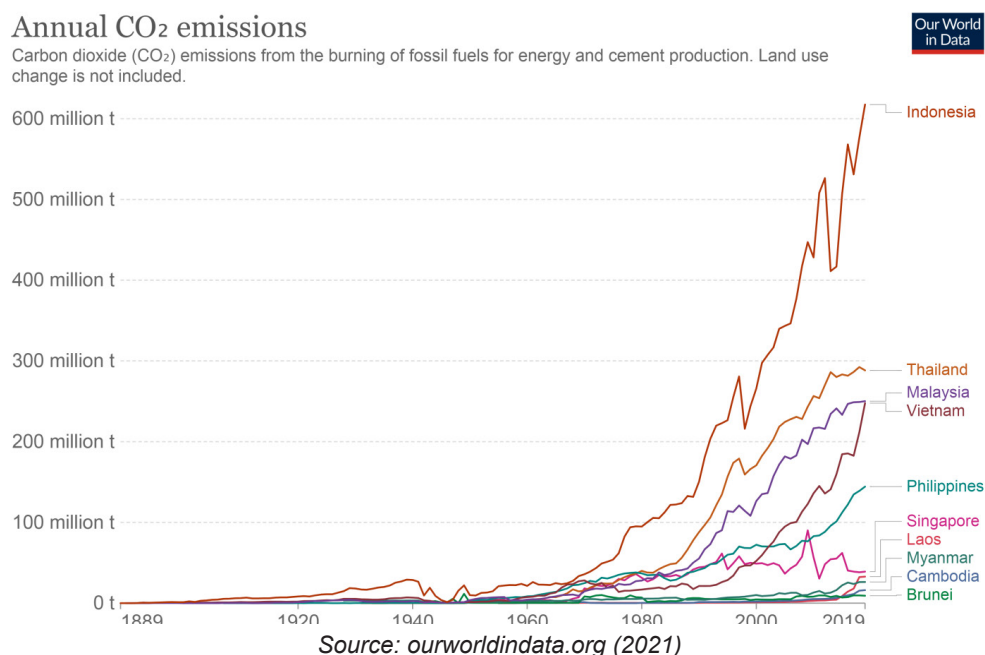
Figure 4.1: Map of Indonesia's Regional Vulnerability to Climate Change



Source: Yusuf & Francisco (2009)

Yusuf and Francisco's research aligns with the Global Climate Risk Index (CRI) findings, indicating an increasing trend in climate risks. The CRI, a quantitative measure of losses from extreme weather, ranked Indonesia 24th in 2021 with a CRI value of 25.83, a significant rise from its 64th position and a score of 68.17 in the previous year (Eckstein, Kunzel, & Schafer, 2021, p. 39; Eckstein, Kunzel, Schäfer, & Wings, 2020, p. 40). This elevation signals a growing impact of extreme weather events on Indonesia, further compounded by its status as Southeast Asia's top carbon dioxide emitter. By 2019, Indonesia's emissions reached 617.51 million tons of CO₂e, surpassing other regional countries (Ritchie & Roser, CO₂ emissions, 2021).

Figure 4.2: Annual CO₂ Emissions



The poor condition of Indonesia is reflected in the mapping of climate change risk to seven main areas conducted by Bappenas (National Development Planning Agency) in 2014. The mapping results state that Java, Bali, and Sumatra are areas with high and very high climate change risk compared to other regions in Indonesia.

Table 4.1: Climate Change Risk Levels by Region in Indonesia

Risk	Sumat- era	Java and Bali	Kali- mantan	Su- lawesi	Nusa Tenggara	Malu- ku	Papua
Decreased wa- ter availability	M,H,VH	H,VH	L,M	H,VH	H,VH	L,M	L
Flood	H,VH	H,VH	L,M,H	L,M,H	L,M,H	L	L,M
Drought	H,VH	H,VH	L	L,M	L,M	L	L
Flooding of sea water on the coast	M,H	M,H,VH	M,H,VH	M,H	M,H	M,H	M,H
Spread of den- gue fever	L,M,H	L,M,H	L,M	L,M	L,M	L,M	L,M,H
Spread of ma- laria	L,M	L,M,H	L,M	L,M,H	L,M,H	M,H	M,H,VH
Spread of diar- rhea	L,M,H	L,M,H	L,M,H	L,M,H	L,M,H	L,M,H	L,M,H,VH
Decreased rice production	H,VH	H,VH	-	-	-	-	-
Forest fires	M,H,VH	H,M	-	-	-	-	-

Source: Bappenas (2014)

Note: L: low M: medium H: High VH: very high

The Indonesian economy faces significant losses due to climate change impacts. Without climate resilience interventions, Bappenas forecasts economic losses could reach IDR 115 trillion by 2024, but with intervention, losses might decrease to IDR 57 trillion (Sesotyaningtyas M. et al., 2021, p. 5). The Asian Development Bank (2009, p. 82) also highlights that climate change could lead to an average economic loss of 2.2% of the National GDP by 2100 in Indonesia.

Indonesia's response includes active participation in climate change mitigation and adaptation efforts, notably through the United Nations Framework Convention on Climate Change Conference of the Parties (UNFCCC COP). The country ratified the Kyoto Protocol through Law No. 17 of 2004 and the Paris Agreement through Law No. 16 of 2016.

Indonesia issued presidential regulation No. 61 of 2011 to demonstrate its commitment further, setting a GHG emission reduction target of 26% by 2020 and 41% by 2030. It also published a Nationally Determined Contribution (NDC) in 2016, aiming for a reduction of 29% (independently) and up to 41% (with international support) by 2030. Updating its NDC commitments, Indonesia aims for long-term emission reductions until 2050, aligning with the Katowice Package from UNFCCC-COP 23 in 2018.

Through these updated NDC commitments, Indonesia anticipates reducing GDP loss in climate hazard-affected sectors by 0.34% in 2020 and 1.15% in 2024 by implementing energy use, waste management, industrial processes, agricultural resilience, and forestry and land use control strategies.

Table 4.2: Project BAU and Emission Reduction from Each Sector Category

Sector	GHG emission Level 2010 (MTon CO ₂ e)	GHG emission Level 2030			GHG Emission Reduction				Annual Average Growth BAU (2010-2030)	Average Growth BAU (2000-2012)
		MTon CO ₂ e			MTon CO ₂ e		% of Total BaU			
		BaU	CM1	CM2	CM1	CM2	CM1	CM2		
Energy*	453.2	1,669	1,355	1,223	314	446	11%	15.5%	6.7%	4.50%
Waste	88	296	285	256	11	40	0.38%	1.4%	6.3%	4.00%
IPPU	36	70	67	66	3	3.25	0.10%	0.11%	3.4%	0.10%
Agriculture**	111	120	110	116	9	4	0.32%	0.13%	0.4%	1.30%
Forestry and Other Land Uses (FOLU)**	647	714	217	22	497	692	17.2%	24.1%	0.5%	2.70%
Total	1,334	2,869	2,034	1,683	834	1,185	29%	41%	3.9%	3.20%

Source: Indonesia Update NDC 2021

Notes : CM1= Counter Measure 1 (Unconditional mitigation scenario)
CM2 = Counter Measure 2 (Conditional mitigation scenario)

*) Including fugitive

**) Only include rice cultivation and livestock

***) Including emission from estate crops plantation

Indonesia's commitment to mitigating climate change is evident in its improved ranking in the Climate Change Performance Index (CCPI), moving from 39th place with a score of 44.65 (Burck, Hagen, Höhne, Nascimento, & Bals, 2020, p. 9) to 24th with a score of 53.59 (Burck, Hagen, Bals, Höhne, & Nascimento, 2021, p. 7). Despite this progress, the financial commitment has been substantial, with expenditures of USD 17.48 billion from 2007 to 2014 and USD 55.01 billion from 2015 to 2019 (Ministry of Environment, 2021, p. 16). To achieve its 2030 emission reduction targets of 29% with domestic resources and 41% with international assistance, Indonesia estimates a need for around USD 247.2 billion, later revised to IDR 4,520 trillion (USD322.86 billion) (Ministry of Environment, 2021, p. 17). This estimation focuses solely on mitigation efforts, not accounting for the broader costs of creating a conducive environment for these changes. With ambitions to reach Net Zero Emissions by 2050, the financial requirements are expected to increase.

Table 4.3: Funding Needs to Achieve NDC Targets by 2030

Sector	Activity	Emission Reduction Potential *)	Estimated Cost (US\$ billion)**)
Forestry and Land	<ul style="list-style-type: none"> • Forest conservation and protection programs • Forest fire prevention 	655 million tons of CO2	5,56
Energy and Transportation	<ul style="list-style-type: none"> • Construction of renewable energy power plants • Clean technology investment 	398 million tons of CO2	236,2
Production Process and Product Use (PPPU)	Majority for cement and iron industry (80% private investment)	3.25 million tons of CO2	0,4
Waste	Liquid and solid waste treatment at industrial and household levels	26 million tons of CO2	2,9
Agriculture	<ul style="list-style-type: none"> • Low emission rice varieties • Irrigation efficiency • Biogas Utilization • Improving the quality of livestock supplements 	4 million tons of CO2	2,2
Total			247,3

Source: Indonesia Second Biennial Update Report (BUR), 2018

Notes:

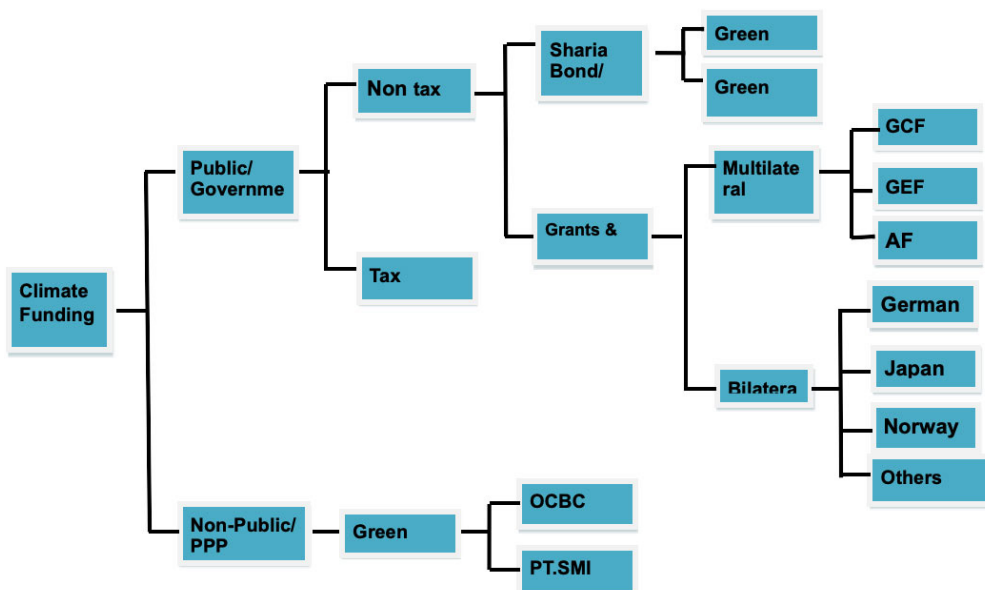
*) To achieve the 2030 target based on the Business as Usual (BAU) scenario

***) Excluding emission reduction costs per stage of wood production, new technologies that may emerge at each stage, and peatland management technology costs

Climate change financing in Indonesia is diverse, encompassing public funds (including government-business partnerships and international grants and loans) and non-public funds (from private entities). Key governmental institutions include the Ministry of Finance, handling public funding, and the Financial Services Authority (Otoritas Jasa Keuangan/OJK), which facilitates private financing. Public funding is sourced domestically from taxes and non-tax revenues, including state bonds like Sovereign green sukuk and SDGs Bond, and internationally through multilateral and bilateral grants and loans, accessible via the UNFCCC scheme (e.g., Adaptation Fund, Global Environment Facility, Green Climate Fund) and beyond, with contributions from countries like Norway, Japan, and the USA, and organizations such as ADB and JICA.

Non-public funding involves government-business partnerships (PPP), detailed in Presidential Decree No. 38 of 2015 and Permen PPN/Head of Bappenas No. 2 of 2020, allowing private entities to manage infrastructure for a period before transferring it back to the government. The push for private investment in climate finance has been bolstered by the Sustainable Finance Roadmap and regulations like POJK Number 51 of 2017 and Number 60 of 2017, promoting green bonds for environmentally friendly projects. Significant contributors include PT Sarana Multi Infrastruktur and Bank OCBC NISP through the issuance of green bonds aimed at environmental conservation (Permana et al., 2019).

Figure 4.3: Sources of Funding for Climate Resilience Through the National Development Planning System



Source: processed from various sources (2021)

Based on the Fiscal Policy Agency report, climate finance in Indonesia is primarily sourced from the government budget at 66%, with international public funding at 34%. Of the latter, 86% targets mitigation and adaptation projects through SOEs or the private sector, predominantly as loans, while the remaining supports policy development and other indirect activities via ministries and local governments (Permana et al., 2019, p. 1).

4.1.1. PUBLIC FUNDING

Climate resilience funding from public coffers may originate domestically or internationally. Domestically, it's fueled by tax revenues and other means, such as issuing Sovereign green sukuk and SDGs Bonds. Internationally, it primarily comes in grants and planned loans, both bilateral and multilateral. National mechanisms for channeling these funds include government budgets and National Climate Funds (NCF) .

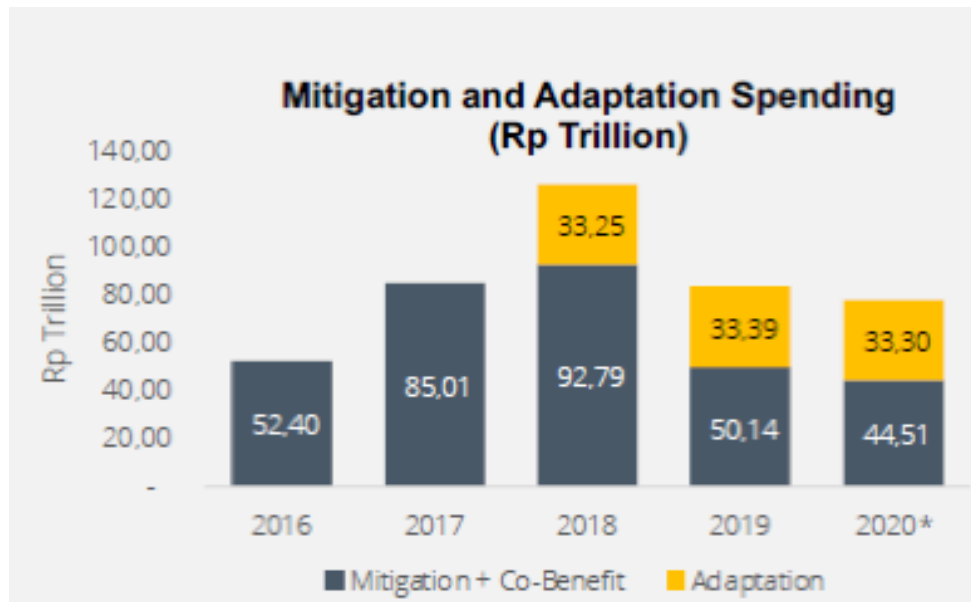
Foreign funds flow through intermediary bodies like government ministries, international development organizations, regional governments, and specific Climate Change Fund Trust Institutions. The NCF, a pivotal mechanism in managing climate finance, aims at collecting, integrating, and leveraging funds, enhancing national involvement in climate finance, as seen in countries like Indonesia (ICCTF), Thailand, China, Bangladesh, and Cambodia (UNDP, 2011).

4.1.1.1. DOMESTIC FUNDING

Public funding in Indonesia for climate change initiatives largely derives from the APBN, encompassing tax revenues, PNBPN, grants, state sharia securities , and other legitimate sources. These funds support mitigation and adaptation efforts directed by respective ministries/ agencies as outlined in the RAN-API and RAN-GRK. The Ministry of Finance introduced Sovereign green sukuk and SDGs Bonds in 2018 to bolster domestic funding mechanisms.

That year, IDR 72.2 trillion was allocated for mitigation and IDR 37.5 trillion for adaptation activities, with the State Budget being the primary funding source. Despite positive growth in the climate change budget in 2018, with a 14.7% increase from 2017 and 51.1% from 2016, reaching IDR 132.4 trillion, there was a notable decrease to IDR 97.66 trillion in 2019 and further to IDR 77.81 trillion in 2020, indicating a significant reduction in APBN's allocation for climate change (Badan Kebijakan Fiskal, 2018).

Figure 4.4: Mitigation and Adaptation Spending



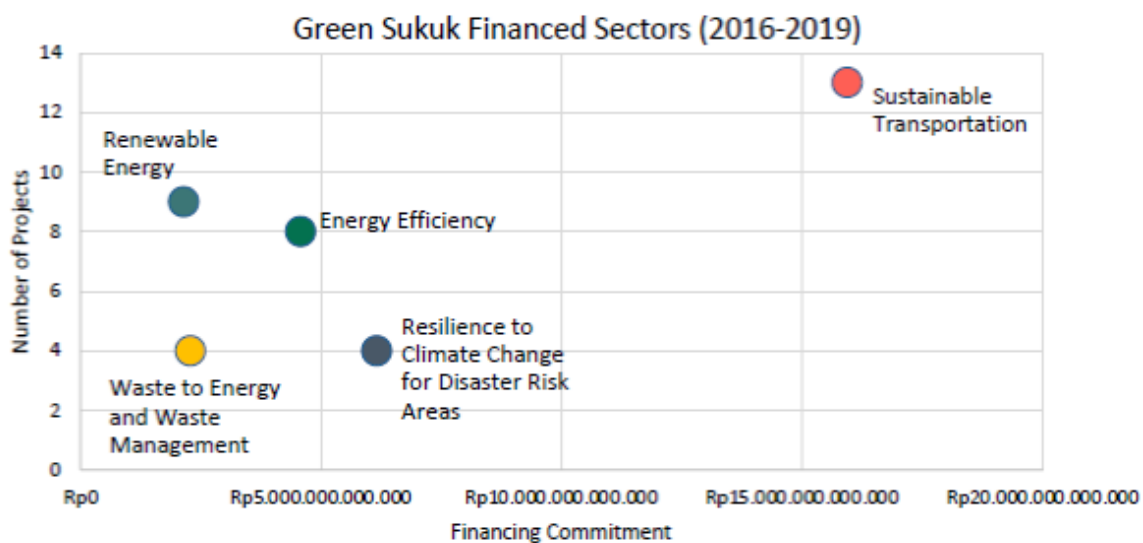
Source: Ministry of Finance 2021

From 2018 to 2020, the State Budget allocated an average of IDR 102.65 trillion annually to climate change, with IDR 62.7 trillion for mitigation and IDR 40.4 trillion for adaptation yearly. Approximately 55% was for mitigation, 34% for adaptation, and 11% for activities benefiting both.

4.1.1.1.1. GREEN BOND AND GREEN SHARIA BOND FRAMEWORK

The Government of Indonesia has developed a Green Bond and Green Sukuk Framework to encourage low-carbon economic growth and climate resilience, evaluated by the Center for International Climate and Environmental Research (CICERO) with a Medium Green rating. This framework aims to facilitate financing for green projects, such as climate mitigation, adaptation, and biodiversity, through green sukuk and SDGs bonds. In a pioneering move, Indonesia launched a US\$1.25 billion global green sukuk in March 2018, with 51% of the proceeds refinancing green projects from 2016 and 49% financing 2018's green projects across five sectors, including renewable energy and climate resilience (dark green category), alongside sustainable transportation, waste management, and sustainable agriculture (medium green category). Continuing its commitment, Indonesia issued a further US\$750 million green sukuk in 2019, allocating 51% to 2017's green projects and 49% to those in 2019.

Figure 4.5: Green Sharia Bonds Financed Sector (2016-2019)



Source: Ministry of Finance 2020

In 2020, the government issued global sukuk in the US dollar market totaling \$2.5 billion, distributed across three series: a 5-year at \$750 million with a 2.30% yield, a 10-year at \$1 billion with a 2.80% yield, and a 30-year at \$750 million with a 3.80% yield (Pratomo, 2020). Following this, in 2021, the Indonesian government launched a 500 million euro SUN for Sustainable Development Goals (SDGs) with a 12-year tenor, featuring a 1.30% coupon rate and a 1.351% yield (Mahardika, 2021).

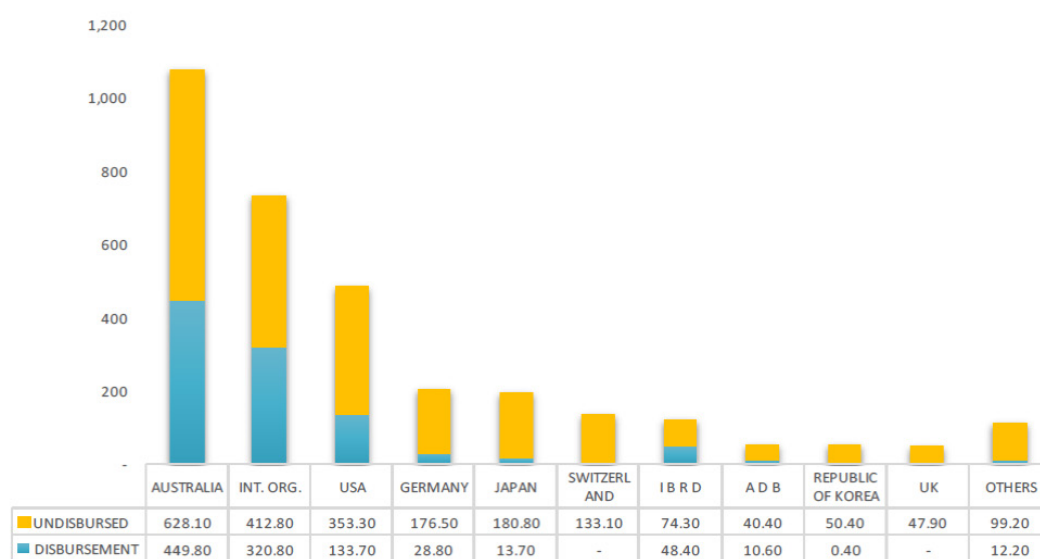
4.1.1.1.2. OVERSEAS FUNDING

Climate resilience financing is accessible through UNFCCC convention bodies, including the Adaptation Fund (AF), Global Environment Facility (GEF), and Green Climate Fund (GCF), aimed at aiding developing countries. Non-UNFCCC sources like the Asian Development Bank (ADB), JICA, World Bank, European Investment Bank (EIB), and USAID offer support. Financing is available in grants and loans, categorized into planned and direct grants for international support.

4.1.1.2. GRANTS

In the State Revenue and Expenditure Budget (APBN) structure, grant receipts form a key revenue component, sourced domestically or internationally, and classified into planned or direct grants. These non-repayable grants, provided in various forms such as cash or goods, must be politically unbiased and not threaten national stability, aiding ministry functions or disaster management. Notably, as of December 31, 2020, significant foreign grants were received from Australia (\$1,077.9 million) and International Organizations (\$733 million) (DJPPR, 2021, p. 19).

Figure 4.6: Value of Foreign Grant Commitments by Donor Country/Agency



Source: DJPPR (2021)

Grant funds from international donor agencies are often integrated into the government budget, including grants under the UNFCCC convention. Key climate resilience funding mechanisms under this convention include the AF, GEF, and the GCF.

4.1.1.2.1. ADAPTATION FUND (AF)

Indonesia's accredited National Implementing Entity (NIE), the Indonesian Partnership, facilitates access to Adaptation Fund (AF) resources through proposal calls under an umbrella program. Coordination with national plans is ensured by each country's National Designated Authorities (NDA), which in Indonesia is the Directorate General of Climate Change Control (DJPPI) under the Ministry of Environment and Forestry. The NDA authorizes NIE accreditation and proposal approvals to the Adaptation Fund, playing a crucial role in adaptation projects and program implementations.

Figure 4.7: The Process of Accessing Funds Directly Through the Adaptation Fund



Source: Ministry of Finance (2021)

Between 2000 and 2020, Indonesia received US\$ 167,712,542 in AF funds from 60 donors (Kemitraan, 2021). In 2020, US\$ 4,828,953 million was contributed by 13 active donors for 33 projects focusing on environmental sustainability, democratic and civil rights, and knowledge management (Kemitraan, 2021, pp. 42-48).

4.1.1.2.3. GLOBAL ENVIRONMENT FACILITY (GEF)

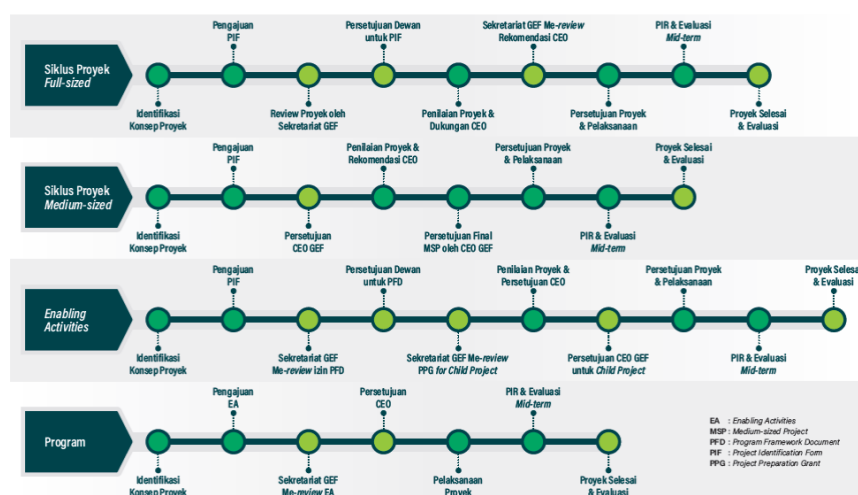
The GEF funding is contingent upon the GEF Replenishment process, a donor commitment mechanism to the GEF Trust Fund, occurring every four years. The sixth phase (GEF-6)

spanned from July 1, 2014, to June 30, 2018, amassing US\$4.43 billion in funds. During GEF-6, Indonesia was designated as the beneficiary for 12 projects, receiving a total allocation of US\$83.92 million, distributed as follows:

- US\$21.91 million for climate change initiatives
- US\$57.84 million targeting biodiversity conservation
- US\$4.16 million aimed at combating land degradation

Eligibility for GEF funding mandates adherence to national policies, alignment with GEF Focal Area Strategies, consistency with international conventions, and endorsement by the GEF Operational Focal Point (OFP). In Indonesia, GEF coordination is managed by the GEF OFP and the GEF Political Focal Point (PFP), involving officials from the Ministry of Environment and Forestry (KLHK) and the Indonesian Embassy in Washington, DC. Funding access is depicted in Figure 4.8, detailing the four GEF modalities.

Figure 4.8: Access to Funding Scheme through GEF Grants



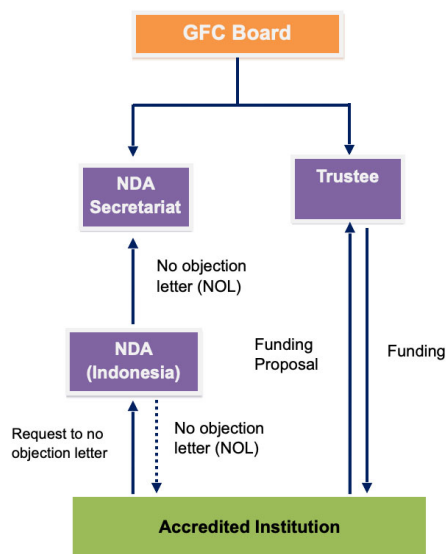
Source: Ministry of Finance (2021)

4.1.1.2.4. GREEN CLIMATE FUND (GCF)

The GCF engagement involves three pivotal actors: the National Designated Authority (NDA), Accredited Entities (AE), and Executing Entities (EE). The NDA, represented by the Fiscal Policy Agency (BKF) in Indonesia, is the country’s liaison with the GCF. AEs, private and public organizations, are accredited to develop funding proposals and manage projects. EEs, distinct from AEs, manage the project implementation under AE supervision. Indonesia’s notable AEs include PT Sarana Multi Infrastruktur and Indonesia Infrastructure Finance, with another partnership in the accreditation phase.

Key projects funded by the GCF in Indonesia include the Indonesia Geothermal Resource Risk Mitigation Project (IGRRMP), with a \$410 million investment, aiming to reduce emissions by 112.2 million tonnes of CO₂ over 10 years, and the Climate Investor One (CIO), which targets mitigation in 11 countries, including Indonesia, with an \$821.5 million investment and a goal to reduce emissions by 53.7 million tonnes of CO₂ over 20 years.

Figure 4.9: Access to Funding Process through the Green Climate Fund (GCF)



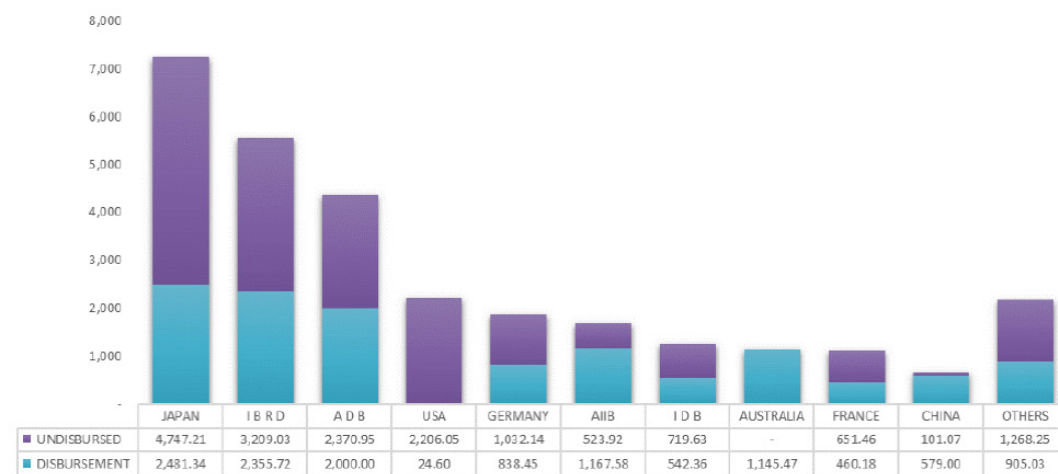
Source: Ministry of Finance (2021)

4.1.1.2.3. LOANS

Indonesian government loans consist of domestic and foreign loans, significantly contributing to climate resilience funding. Foreign loans finance deficits, manage debt portfolios, and support infrastructure projects for climate resilience, such as geothermal power plants and drainage rehabilitation. These loans are categorized by lender type into official and private creditors and by type into bilateral, multilateral, commercial banks, suppliers/company creditors, and bondholders. Moreover, foreign loans are classified based on credit terms into soft and commercial loans for bilateral (ODA/Non-ODA), multilateral loans (concessional/non-concessional), and market-based commercial loans.

Japan, the International Bank for Reconstruction and Development (IBRD), and the Asian Development Bank (ADB) are the primary foreign lenders to Indonesia, with 21 countries/organizations providing active loans totaling \$29,329.43 million (DJPPR, 2021, p. 11).

Figure 4.10: Value of Active Foreign Loan Commitments by Country/Lending Institution



Source: DJPPR (2021)

4.1.2. NON-PUBLIC FUNDING

In 2014, the Roadmap for Sustainable Finance in Indonesia catalyzed non-public funding for climate resilience, followed by Financial Services Authority Regulation (FSAR) Number 51 of 2017 and FSAR Number 60 of 2017. The latter mandates that green bonds finance Environmentally Friendly Business Activities (EFBA), including:

- Renewable energy
- Energy efficiency
- Pollution prevention and control
- Management of living natural resources and sustainable land use
- Conservation of terrestrial and aquatic biodiversity
- Environmentally friendly transportation
- Sustainable water and wastewater management
- Climate change adaptation
- Eco-efficient products
- Environmentally friendly buildings
- Other environmentally sound activities

Issuers of green bonds must secure an environmental expert's assessment, confirming the environmental benefits of the financed activities. Notably, PT Sarana Multi Infrastruktur and Bank OCBC NISP have issued green bonds, expanding climate change funding through non-public means.

4.1.2.1. GREEN BONDS PT. SMI

PT SMI, an Indonesian government-owned infrastructure financing company, plays a pivotal role in climate change mitigation through non-public funding mechanisms, notably green bonds. In line with various environmental and social frameworks and guidelines (Green Bond Framework, Environmental and Social Safeguard, Environmental and Social Management Framework, and Environmental and Social Management System), PT SMI issued its Phase I Sustainable Infrastructure Bond (Green Bond) in 2018, totaling IDR 1 trillion. This issuance, divided into Series A (3-year term) and Series B (5-year term), earned a Triple A rating from PT Pemeringkat Efek Indonesia (Pefindo). The proceeds are allocated to eco-friendly projects across six sectors:

- Renewable energy
- Energy efficiency
- Sustainable pollution prevention and management
- Natural resource management and sustainable land use
- Eco-friendly transportation
- Sustainable water and waste management

To ensure compliance and sustainability, these projects undergo rigorous screening under PT SMI's Environmental and Social Management System.

4.1.1.2.3.3. GREEN BONDS OCBC NISP BANK

Bank OCBC NISP collaborates with the International Finance Corporation (IFC), a World Bank group member, for its inaugural issuance of green bonds, securing a \$150 million investment from IFC. These funds are earmarked for eco-friendly projects, initially targeting water management ventures. In 2018, Bank OCBC NISP launched Shelf-Registered Bonds III, Phase I, raising IDR1 Trillion across three series: Series A (IDR IDR655 billion, 370-day tenor, 6.75% interest), Series B (IDR3 billion, two-year tenor, 7.25% interest), and Series C (IDR342 billion, three-year tenor, 7.75% interest), with quarterly interest payments. The issuance involved PT Indo Premier Sekuritas, PT BNI Sekuritas, PT OCBC Sekuritas Indonesia, PT RHB Sekuritas Indonesia, and PT Trimegah Sekuritas Indonesia Tbk as managing underwriters.

4.2. MALAYSIA

Malaysia, a Southeast Asian tropical nation, boasts over 4,800 km of coastline and over 50% forest coverage, supporting high biodiversity. However, it faces ecosystem degradation challenges, especially in wetlands and forests. Since the 1960s, Peninsular Malaysia has experienced notable deforestation, primarily due to agricultural expansion, such as for palm oil, though the rate has decelerated since the 1980s. Climate change poses additional threats to its natural resources (Chapman, Davies, & Downey, 2021, p. 3).

As of 2019, Malaysia, with a population of around 32 million, is a developed economy in its region despite facing significant income inequality, with a GINI coefficient of 46.3 recorded in 2009. The Malaysian Government has since been working to reduce this disparity. The nation's economy is primarily driven by the services sector, accounting for 54.5% of GDP, and manufacturing, making up 23% of GDP, while agriculture engages only about 11% of the workforce.

Facing challenges like energy consumption growth and environmental degradation, Malaysia has implemented policies such as the National Renewable Energy Policy and Action Plan (2009), National Policy on Climate Change (2009), National Green Technology Policy (2009), and Renewable Energy Act (2011). It is a party to international agreements, including the Paris Agreement. The country aims to cut its carbon emissions intensity by 40% by 2020 and 45% by 2030, from 2005 levels, with additional support from developed nations. The Tenth (2011–2015) and Eleventh (2016–2020) National Plans focused on climate resilience, and the twelfth plan, passed in 2021, targets making Malaysia carbon-neutral by 2050 through energy, transportation, and land use sector reforms. This includes promoting electric vehicles and renewable energy and eliminating coal-fired power plants (Susskind, Chun, Goldberg, Gordon, Smith, & Zaerpoor, 2020, p. 1).

Table 4.4: Relevant Malaysian policies and targets

Sectors	Policies	Targets
Renewable Energy	Power Sector Development Plan 2021-2039	31% renewable energy installed capacity mix by 2025, 45% reduction of emissions from the power sector by 2030 compared to 2005 level

Sectors	Policies	Targets
Energy Efficiency	National Energy Efficiency Action Plan 2016	A savings of 52,233 GWh of electricity from 2016 to 2025, corresponding to an 8% reduction of electricity demand by 2025 across residential, commercial and industrial sectors
	Green Technology Master Plan Malaysia 2017-2030	15% reduction in electricity consumption by 2030
Transport	National Automotive Policy 2020	Reduce carbon emissions in line with the ASEAN Fuel Economy Roadmap of 5.3 Lge/100km by 2025
	National Land Public Transport Masterplan	40% modal share of public transport in urban areas by 2030
	National Electric Mobility Blueprint 2015-2030	100,000 electric cars, 100,000 electric motorcycles, 125,000 charging stations, 2000 electric buses by 2030
Building	Green Technology Master Plan Malaysia 2017-2030	1,750 green buildings certified by 2030
Manufacturing	Green Technology Master Plan Malaysia 2017-2030	Increase in the number of green manufacturers to 17,000 by 2030
Waste	Green Technology Master Plan Malaysia 2017-2030	28% recycling rate by 2030
Forestry	Malaysian Forestry Policy	50% of the land mass to be maintained under forest cover

Source: Central Bank of Malaysia (2021)

The Malaysian government has implemented market-based mechanisms to encourage emission reduction and finance adaptation to climate change, including the Clean Development Mechanism (CDM), financial incentives, building regulations, and insurance provisions (Begum, Abidin, & Pereira, 2011). However, addressing climate change effectively requires substantial funding. The renewable energy sector alone needs RM33.5 billion by 2025, with the government's allocation falling short at RM7.24 billion during the Eleventh Malaysia Plan (2016-2020), indicating a significant funding gap (Ismail, 2020, p. 21). To bridge this, policies have been enacted to attract both public and private investment:

- Capital Market Masterplan 2 (CMP2) by Securities Commission Malaysia (SCM) in 2011.
- Sustainable and Responsible Investment (SRI) Sukuk Framework by SCM in 2014.
- Sustainability Reporting by Bursa Malaysia in 2016.
- Value-Based Intermediation (VBI) by the Central Bank of Malaysia and the Islamic Fund and Wealth Management Blueprint (IFWMB) by SCM in 2017.
- SRI Roadmap (2019-2025) by SCM in 2019.

4.2.1. DOMESTIC FINANCING SCHEME

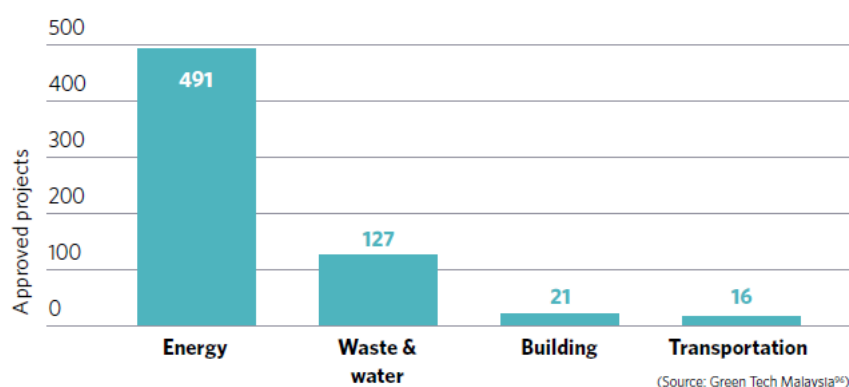
Various initiatives and domestic financing schemes have been introduced by the government to raise public funds to create a conducive environment, thus enabling more mitigation efforts,

including the Green Technology Financing Scheme (GTFS), Green Investment Tax Allowances (GITA), and Green Income Tax Exemption (GITE), Low Carbon Cities Framework (LCCF) and Government Green Procurement. (Ministry of Environment and Water, 2020, pp. 56-57).

4.2.1.1. GREEN TECHNOLOGY FINANCING SCHEME (GTFS)

The GTFS has been instrumental in promoting green technology projects by offering easier access to financing. Introduced in 2010 and extended until 2017, GTFS provides a government guarantee of 60% for the financed amount and a 2% annual rebate on the interest or profit rate from financial institutions. It covers energy, building, transport, waste, and water projects. By the end of 2017, it had approved 319 projects with RM3.64 billion in financing, predominantly in renewable energy. GTFS 2.0, launched in March 2019 with an RM2.0 billion allocation, expanded eligibility to energy service companies (ESCOs) and the manufacturing sector. This scheme has notably contributed to environmental sustainability by supporting around 5,000 green jobs and reducing CO2 emissions by 3,784 million tons annually. The latest iteration, GTFS 3.0, introduced with an RM2 billion fund, aims to generate RM4 billion in green investments and create 2,500 job opportunities, further bolstering the nation’s commitment to green growth.

Figure 4.12: GTFS performance by sector, 2010-2020



Source: Green Tech Malaysia (2021)

4.2.1.2 GREEN INVESTMENT TAX ALLOWANCES (GITA) AND GREEN INCOME TAX EXEMPTION (GITE)

In 2014, Malaysia introduced Green Technology Tax Incentives, comprising the Green Investment Tax Allowances (GITA) for qualifying green assets and projects and the Green Income Tax Exemption (GITE) for green service providers. The initiative aims to bolster green technology development. Eligibility for these incentives extends to companies acquiring green technology assets, those undertaking green technology projects, and green service providers listed under the My HIJAU Directory, which catalogs products and services meeting environmental standards. The incentives have supported numerous renewable energy and energy efficiency projects under GITA and GITE.

4.2.1.3. LOW CARBON CITIES FRAMEWORK (LCCF)

The Low Carbon Cities Framework (LCCF), initiated in 2011, is a national guideline for Local

Governments to evolve into Low Carbon Cities. It offers tools for designing cities alongside measurement, reporting, and assessment methods to foster systematic and impactful low-carbon strategies. This encompasses the urban environment, transportation, infrastructure, and buildings. By 2019, 53 Local Governments had been trained on the LCCF, with 22 implementing strategies that reduced GHG emissions from their baselines. The program also expands its influence in the private sector, encouraging collaboration with Local Governments to promote low-carbon cities.

4.2.1.4. GOVERNMENT GREEN PROCUREMENT

The Government Green Procurement (GGP) in Malaysia, initiated in 2013 under the Ministry of Finance's guidance, aims to integrate environmental considerations into procuring goods, services, and works. The 11th Malaysian Plan targets a 20% GGP achievement by 2020. By 2017, GGP encompassed 30 product groups, with 25 ministries and agencies participating, achieving a procurement value of RM286.3 million.

4.2.2. INTERNATIONAL MARKET MECHANISM

Malaysia's engagement with the Clean Development Mechanism (CDM) under the UNFCCC and Voluntary Carbon Market aims to enhance environmental quality alongside sustainable development goals. Since establishing the National CDM Committee on 31st May 2002, Malaysia has actively overseen CDM project implementation, supported by specialized Technical Committees in Energy, Agriculture, and Forestry. By December 2018, Malaysia had registered 143 CDM projects and five Programmes of Activities (PoAs) with ten Component Project Activities (CPAs) with the CDM Executive Board, accounting for 1.8% of global CDM activities under the Kyoto Protocol. These initiatives, with an investment of USD 1,529 million, have generated 12,314,456 Certified Emission Reductions (CERs) from 2006 to 2018, as detailed in Table 4.5, which outlines the distribution of CDM projects by type, their potential emissions reductions, CERs issued, and reported investments.

Table 4.5: Distribution of Clean Development Mechanism Project Activities by Project Type

Type	Sub-Type	No. of Registered Projects	% of Total Number of Projects	Annual Emission Reduction Potential (t CO ₂ eq/yr)	% of Total Annual Emission Reduction Potential	CERs Issued (2006-2012) (tCO ₂ eq)	CERs Issued (2013-2018) (tCO ₂ eq)	Total CERs Issued (2006-2018) (tCO ₂ eq)	Estimated Investment (mil USD)
Biomass energy	Oil palm solid biomass	31	21.68	2,547.431	28.92	2,188.896	3,415.962	5,604.858	148.55
	Agricultural residues	5	3.50	615.834	6.99	0.00	538.471	538.471	8.88
	Wood waste	4	2.80	110.777	1.26	0.00	0.00	0.00	27.97
	Gasification	1	0.70	26.983	0.31	0.00	0.00	0.00	0.00

Type	Sub-Type	No. of Registered Projects	% of Total Number of Projects	Annual Emission Reduction Potential (t CO ₂ eq/yr)	% of Total Annual Emission Reduction Potential	CERs Issued (2006-2012) (tCO ₂ eq)	CERs Issued (2013-2018) (tCO ₂ eq)	Total CERs Issued (2006-2018) (tCO ₂ eq)	Estimated Investment (mil USD)
Energy efficiency	Electronics	2	1.40	7.786	0.09	0.00	0.00	0.00	0.00
	Machinery	1	0.70	173	0.00	0,00	0.00	0.00	0.48
Hydro-power	Run of river	3	2.10	105.083	1.19	0.00	42.922	42.922	48.80
	New dam	2	1.40	260.421	2.96	8.372	34.257	42.629	824.23
Landfill gas	LFG power	6	4.20	586.488	6.66	433.328	2.188.042	2.62,370	22.46
	LFG flaring	3	2.10	360.707	4.09	12.623	0.00	12.623	10.20
CH ₄ avoidance	Palm oil milleffluent	54	37.76	2.249,808	25.54	492.249	951.437	1.443,686	188.17
	Composting	27	18.88	770.107	8.74	31.381	171.826	203.207	47.88
EE supply side	Single combined cycle	1	0.70	595.460	6.76	974.168	351.887	1.326,055	102.24
Fuel switch	New NG plant	1	0.70	299.832	3.40	0.00	477.057	477.057	99.83
Geothermal	Geothermal electricity	1	0.70	269.026	3.40	0.00	0.00	0.00	0.00
Transport Efficient	Efficient vehicles	1	0.70	3.156	0.04	0.00	1.578	1.578	0.00
Total		143	100,00	8.809,072	100.00	4.141,017	8.173,439	12.314,456	1.529,69

Source: The Third Biennial Update Report (2020)

4.2.2.1. VOLUNTARY CARBON MARKET

In addition to the CDM, Malaysia also participated in 12 voluntary carbon market projects validated to the Verified Carbon Standard (VCS) criteria. Of these, eight were methane emission avoidance projects, two hydropower projects, and one under biomass and reforestation projects respectively. Table 4.6 shows the status of these projects.

Table 4.6: Distribution of Voluntary Carbon Market Project Activities by Project Type

Project Type	No. of Projects	Project Estimate of Annual ERs (t CO ₂ eq)	Total VCUs Issued	Total VCUs Retired	Balance Issued VCUs in VCS Registry
CH ₄ avoidance	8	217,714	25,087	25,087	0
Biomass energy	1	21,660	0	0	0
Hydropower	2	45,219	10,692	10,692	0
Reforestation	1	138,013	509,540	509,540	0
Total	12	422,606	545,319	545,319	0

Source: The Third Biennial Update Report (2020)

4.2.3. MULTILATERAL AND BILATERAL FUNDING AND SUPPORT

Integrating climate initiatives into development requires technological, skill, and financial investment. Malaysia has dedicated resources to its low carbon agenda, supported by international funds, notably the Global Environment Facility and the Green Climate Fund, along with bilateral aid from Germany and the UK.

4.2.3.1. GLOBAL ENVIRONMENT FACILITY

From GEF cycle 1 to 6 (June 1994-June 2018), Malaysia received significant funding for climate change activities from the Global Environment Facility (GEF), as detailed in Table 4.7. Especially from cycles 4 to 6 (June 2006 – June 2018), Malaysia was allocated USD 37,082,779, of which USD 32,265,249 was utilized. Despite this, financial challenges faced by GEF during cycle 6 impeded the approval of new projects, affecting Malaysia’s climate action continuity. The funds were mainly invested in enhancing Malaysia’s institutional and technical capacities for UNFCCC reporting and implementing mitigation actions, with the UNDP and UNIDO playing key roles. Priority sectors included transport, energy, forestry (peatland), and low-carbon cities, focusing on building technical and technological capacities.

Table 4.7: Summary of Global Environment Facility Funding on Climate Change Activities in Malaysia

GEF Cycle	Period	Indicative Allocation (USD)	Amount Utilised (USD)
1	July 1994 – June 1998	7,770,600	N/A
2	July 1998 – June 2002	4,000,000	N/A
3	July 2002 – June 2006	8,699,420	N/A
4	July 2006 – June 2010	11,800,000	10,768,500
5	July 2010 – June 2014	14,240,000	14,234,249
6	July 2014 – June 2018	11,042,779	7,262,500

Source: The Third Biennial Update Report (2020)

4.2.3.2. GREEN CLIMATE FUND (GCF)

Malaysia is also exploring opportunities to access the Green Climate Fund (GCF). An area of priority for the country is the development of a comprehensive National Adaptation Plan under which internal funding was used to carry out a scoping study in this area. In developing a comprehensive plan, Malaysia is currently applying for funding from GCF.

Table 4.8: Financial Support Received from Various Sources

Source	Project Description	Focus of support	Project Duration	Implementing Agencies	Delivery Partners	Approved Amount
GEF	Cleantech Programme for SMEs in Malaysia	Technical capacity building	2013-2016	Malaysian Industry Government Group for High Technology	UNIDO	USD 990,000
GEF	Green Technology Application for the Development of Low Carbon Cities	Technical capacity building	2014-2020	Sustainable Energy Development Authority	UNDP	USD 4,354,794
GEF	GHG Emissions Reductions in Targeted Industrial Sub-sectors Through EE and Application of Solar Thermal System	Technical	2015-2019	Standards and Industrial Research Institute of Malaysia	UNIDO	USD 4,000,000
GEF	Energy Efficient Low Carbon Transport	Technical	2015-2020	Malaysian Green Technology Corporation	UNIDO	USD 2,000,000
GEF	Small Grant Projects for Climate Change Action	Technical capacity building	2014-2019	NGOs and CBOs	UNDP	USD 454,000 (cumulative)
Germany	Green Economy in the Heart of Borneo	Technical capacity building	2015-2020	WWF Malaysia	International Climate Initiative (IKI)	€ 2,100,000
UK	Demonstrations of Approaches to Accelerate the Rate of Deployment of Cost Effective, Energy Efficient Technologies in Malaysia	Technical capacity building	2014-2016	Malaysian Green Technology Corporation, SME Corp	Carbon Trust	£ 43,800
UK	Establishment of a Low Carbon City and Green Growth Strategy for Greater Kuala Lumpur	Technical capacity building	2016-2017	Kuala Lumpur City Council	Carbon Trust	£ 142,300

Source	Project Description	Focus of support	Project Duration	Implementing Agencies	Delivery Partners	Approved Amount
UK	Developing Innovative Sustainable Mobility Solutions for Iskandar Regional Development Authority Within a Defined Urban Area Based on UK Smart City Experience and Expertise	Technical capacity building	2016-2017	Iskandar Regional Development Authority	Future Cities Catapult	£ 109,848
UK	Establishing the Policy Framework, Stakeholder Community and Business Case for Scaling Up Combined Heat and Power Deployment	Technical capacity building	2016-2017	KeTSA, Gas Malaysia	Carbon Trust	

Source: The Third Biennial Update Report (2020)

4.2.4. NON-PUBLIC FUNDING

From 2010 to 2015, the Malaysian government's financing scheme fell short of covering investment costs for clean technology projects despite an increase in approved and certified projects (figure 2.14). Financial institutions deemed these projects high-risk, resulting in insufficient funding from participating financial institutions (PFIs).

Figure 4.13: Annual loans approved from PFI's for green technology projects from 2010 - 2015

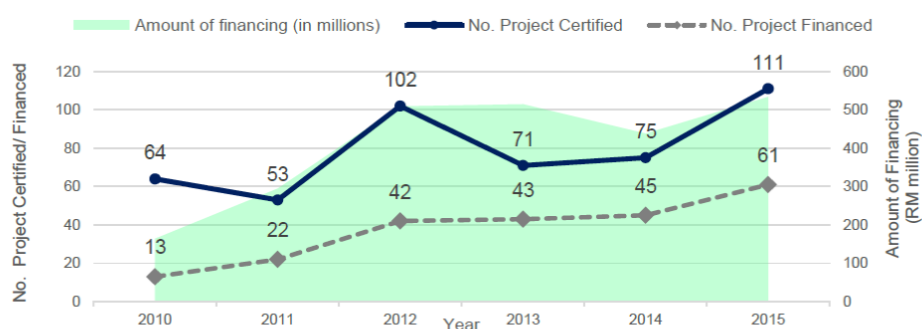
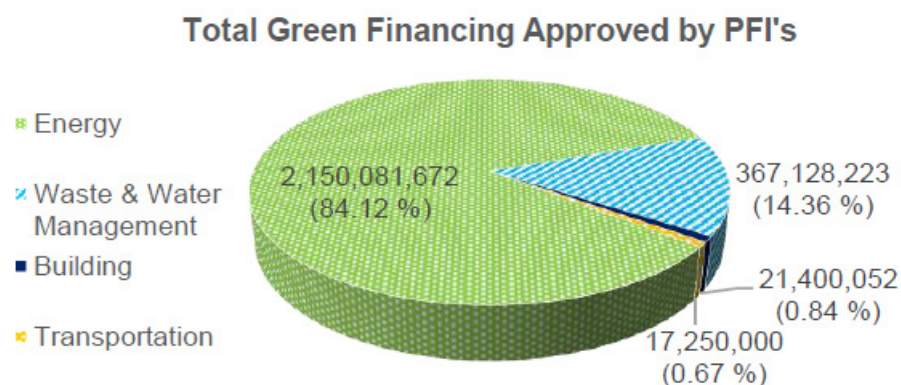


Figure 1: Annual loans approved from PFI's for green technology projects from 2010 - 2015 (Green Tech Malaysia 2016)

Source: Green Tech Malaysia 2016

The limited credit for green and clean technology projects is largely due to banks' unfamiliarity and inadequate evaluation capacity. Consequently, many companies struggle to secure loans. In 2015, of RM 2.5 billion in total loans, the energy sector received 84.12%, followed by waste and water management at 14.36%, building at 0.84%, and transportation at 0.67%.

Figure 4.14: Distribution of Total Green Financing approved by PFI's

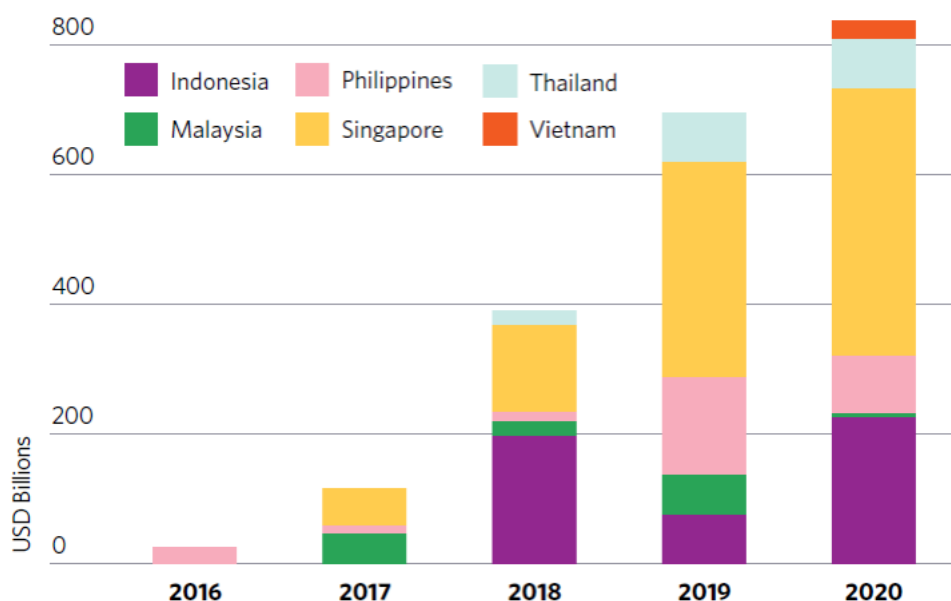


Source: Green Tech Malaysia, 2015

The Malaysian government seeks innovative funding methods for green technology projects, including venture capital for sustainable development, syndicated financing for clean energy, and green bonds for environmentally beneficial projects. Recognizing the role of the financial sector in supporting these initiatives, the Securities Commission Malaysia (SCM) broadened its Sukuk Guidelines in 2014 to introduce a Sustainable and Responsible Investment (SRI) sukuk framework. In 2019, the Central Bank of Malaysia also established the Joint Committee on Climate Change (JC3) to enhance the financial sector's climate resilience, focusing on sub-committees for risk management, governance, products, and capacity building. The governance sub-committee aims to refine disclosure practices and align with the TCFD Recommendations. That same year, the Central Bank issued guidelines and frameworks to promote financing for a low-carbon economy, boosting the green bond and sukuk market.

Figure 4.15: ASEAN Green Bond and Sukuk Issuance (2016-2020)

ASEAN green bond and sukuk issuance is growing



Source: Malaysia GIIO Report (2021)

4.2.4.1. MALAYSIAN GREEN BOND AND SUKUK MARKET ANALYSIS

Malaysia has been actively promoting green finance, focusing on instruments such as green bonds, sukuk, loans, and funds for infrastructure and renewable energy projects, alongside credit guarantees for these initiatives. Green bonds and sukuk are particularly emphasized, supported by guidelines and incentives to foster their issuance:

- The Securities Commission Malaysia introduced the Sustainable and Responsible Investment Sukuk Framework.
- Issuance costs for green sukuk are tax-deductible, with tax exemptions available for investors' policies extended to 2023.
- The SRI Sukuk and Bond Grant Scheme covers external review costs up to USD 74,500 per issuance.
- The Green Technology Financing Scheme (GTFS) allocates MYR5bn (USD1.2bn) for financing, though the end date (20221) is unspecified.

Malaysia has seen 14 green bond and sukuk deals, including significant issuances by Permodalan Nasional Berhad, Pasukhas Group Bhd, and Telekomang Hydro One Sdn Bhd for renewable energy projects. Edra Solar Sdn Bhd and Cypark Resources Berhad issued sukuk aligning with various sustainable and responsible investment standards, financing solar PV plants and community agricultural projects.

The country has also made strides in establishing a local green bond market, with all bonds and sukuk issued in domestic currency, showcasing the market's maturity and potential as a hub for green Islamic finance. Most funds have been allocated to energy and building projects, with significant contributions from notable issuers in each sector. Table 4.9 confirms these green instruments' domestic issuance and size range, emphasizing the market's capability to support local green development efforts. So far, Malaysia has been exploring green debt and equity instruments, supported by credit enhancement mechanisms and other risk-sharing approaches. This includes green bonds, sukuk, loans, funds for green infrastructure and renewable energy projects, and credit guarantees for green projects. Green bonds and green sukuk remain the most dominant green instruments and tools.

Malaysia has taken several steps to encourage the issuance of green bonds and green sukuk, including:

- Guidelines for green sukuk - the Sustainable and Responsible Investment Sukuk Framework introduced by the Securities Commission Malaysia
- Tax deduction of issuance costs for issuers and tax exemptions for investors for socially responsible sukuk and green sukuk. These were initially put in place in 2017 to last until 2020 and have since been extended to 2023
- SRI Sukuk and Bond Grant Scheme exists to cover the cost of external reviews up to a maximum of MYR300,000 (USD74,500) per issuance.
- Financing incentives under the Green Technology Financing Scheme (GTFS) with a total funds allocation of MYR5bn (USD1.2bn) until 20221

Malaysian entities have issued 14 green bond and sukuk deals, with six occurring in 2019 and two in 2020. There has been only one repeat issuer to date - Permodalan Nasional Berhad has come to market three times

A green sukuk was issued by Pasukhas Group Bhd for MYR17m (USD3.9m) (out of a facility size of MYR200m) with a 20-year term, with proceeds allocated to a hydropower plant. The sukuk is guaranteed by Dana Jamin Nasional, the financial guarantor co-owned by Bank Negara Malaysia and the Ministry of Finance.

Another 2019 issuer was Telekosang Hydro One Sdn Bhd with a MYR120m (USD42m) 20-year green junior bond and a MYR470m (USD166m) 18-year green sukuk, both allocated to a 24MW “run-of-river mini hydro” plant.

Two new deals came to market in October 2019. Edra Solar Sdn Bhd issued an 8-tranche MYR245m (USD58m) Sustainability SRI sukuk, with maturities ranging from one to 18 years. While it will primarily refinance the Kuala Ketil solar farm, part of the proceeds will fund the cultivation of pineapples and other crops by the surrounding local community. Given its social angle, this is the country’s first bond aligned with the requirements of the Securities Commission Malaysia’s Sustainable and Responsible Investments (SRI) Sukuk Framework, the ASEAN Green Bond Standards, the ASEAN Social Bond Standards, and the globally recognized GBP, SBP and Sustainability Bond Guidelines. It is also the first to carry three different types of rating from RAM: financial, green (Tier-1 GB), and social (Tier-3 SB).

In October, Cypark Red Sdn Bhd also issued MYR550m (USD131m) under an SRI Sukuk Murabahah program. The deal, which has 19 tranches with terms varying between three and 21 years, will finance three solar PV plants (with 30-MWAC capacity) in Malaysia.

Finally, PNB Merdeka Ventures became Malaysia’s first repeat issuer with 3 deals issued in 2017 and 2019 amounting to USD382m. They are part of its program to finance the Merdeka PNB118 Tower.

Among outstanding bonds, energy (49%) and buildings (48%) represent almost all the allocations. The remaining 3% is spread across Water, Waste, Land Use, and Adaptation, funded predominantly by the Pasuk deal. Permodalan Nasional Berhad (PNB Merdeka Ventures) is the largest issuer in the buildings sector, while Quantum Solar Park (Semenanjung Sdn Bhd) is the largest related to energy.

Table 4.9 shows that all green bond and sukuk deals have been issued in domestic currency, ranging in USD-equivalent size from about USD50m to USD500m and tending towards longer terms. This demonstrates that the Malaysian bond market is sufficiently mature to support the development of a local green bond market. It is also a potential hub for green Islamic transactions, with 75% of outstanding green bonds offered in sukuk format.

Table 4.9: Malaysian green bond and sukuk issuance (2017-2020)

Issuer name	Bond/ Sukuk	Amount Issued*	Issue date	Issuer type	Use of proceeds
Solar Management (Seremban) Sdn Bhd	Sukuk	MYR260m (USD64.4m)	Sept-20	Non-Financial corporate	Energy
Leader Energy Sdn Bhd	Sukuk	MYR260m (USD64.4m)	Jul-20	Non-Financial corporate	Energy
PNB Merdeka Ventures Sdn Bhd	Sukuk	MYR435m (USD105m)	Dec-19	Government backed entity	Buildings
Cypark Ref Sdn Bhd	Sukuk	MYR550m (USD131m)	Oct-19	Non-Financial corporate	Energy
Edra Solar Sdn Bhd	Sukuk	MYR245m (USD58m)	Oct-19	Non-Financial corporate	Energy, Land use
Telekosang Hydro One Sdn Bhd	Bond and Sukuk	MYR590m (USD208m)	Aug-19	Non-Financial corporate	Energy
PNB Merdeka Ventures Sdn Bhd	Sukuk	MYR445m (USD108m)	Jun-19	Government backed entity	Buildings
Pasukhas Green Assets Sdn Bhd	Sukuk	Issue size: MYR17m (USD3.9m) Facility size: MYR200m	Feb-19	Non-Financial corporate	Energy, Buildings, Water, Waste, land use, unallocated A&R
UiTM Solar Power Sdn Bhd	Sukuk	MYR222m (USD57m)	Apr-18	Government backed entity	Energy
Sinar Kamiri (Mudajaya Group Berhad)	Sukuk	MYR245m (USD63m)	Jan-18	Financial corporate	Energy
Segi Astana Sdn Bhd	Bond	MYR415m (USD104m)	Jan-18	Non-Financial corporate	Buildings
PNB Merdeka Ventures Sdn Bhd	Sukuk	MYR690m (USD170m)	Dec-17	Government backed entity	Buildings
Quantum Solar Park (semenanjung) Sdn Bhd	Sukuk	MYR1,000m (USD236m)	Oct-17	Non-Financial corporate	Energy
Tadau Energy Sdn Bhd	Sukuk	MYR250m (USD58m)	Jul-17	Non-Financial corporate	Energy

Source: Malaysia GIIO Report (2021)

4.3. PHILIPPINES

The Philippines, highly susceptible to natural disasters and climate change, experienced 410 disasters from 1985-2015, resulting in over 40,000 deaths and \$23 billion in damages. A more focused period, 2010-2015, saw 96 climate-related disasters, affecting eleven million people annually and causing PHP 750 billion (15.1 billion USD) losses, nearly 9% of the annual budget (Alampay & Torre, 2020). Positioned in the Tropical Cyclone belt and the Pacific Ring of Fire, the Philippines faces significant risks from both climatic and geological hazards. Notably, Super Typhoon Haiyan in 2013 and a series of typhoons in 2020 led to substantial

economic impacts, with the latter causing USD 852 million in losses. Super Typhoon Goni alone resulted in USD 56.3 million in damages across 25 provinces (NDC, 2021). Annually, the country anticipates PHP 177 billion (USD 3.6 billion) in asset losses due to typhoons and earthquakes, with a significant risk of even greater losses over the next 50 years (Alvarez, 2021).

The IPCC and studies by the Asian Development Bank highlight the severe economic risks posed by climate change, suggesting a potential annual GDP loss of 6% by 2100. Conversely, a 0.5% GDP investment in climate adaptation could mitigate losses significantly. Recognizing these threats, the Philippines established an inter-agency committee on climate change in 1991, ratified the UNFCCC in 1994, and the Kyoto Protocol in 2003. Enhanced climate policy efforts led to the enactment of Republic Act No.9729 in 2009, establishing the Climate Change Commission (CCC). The CCC has since developed the National Framework for Climate Change Strategy for 2010-2022 and the 2011-2028 National Climate Change Action Plan (NCCAP), focusing on comprehensive thematic areas for action.

In 2021, the Climate Change Act was amended to Republic Act No. 10174, creating a People’s Survival Fund for long-term adaptation financing. The same year, the Philippines committed to a 75% reduction in GHG emissions from 2020 to 2030, with a mixture of conditional and unconditional targets, under its National Determined Contribution (NDC), though this has faced criticism for lacking a clear implementation plan (Yap, 2021; CCPI, 2021).

4.3.1. PUBLIC FUNDING

Financial institutions, governments, and corporates are crucial in financing climate change adaptation and mitigation. The Philippine government has implemented policies like the National Framework Strategy on Climate Change 2010-2022 and invested significantly in climate change initiatives. Public funds primarily support disaster and climate risk financing, particularly for recovery and rehabilitation. A financial needs assessment for the Philippines highlighted substantial domestic spending on climate activities, with external aid from bilateral and multilateral sources appearing limited. Between 2004 and 2009, the Philippine government allocated US\$1.576 billion for climate change programs across various sectors. In contrast, it received a total of US\$0.863 billion from external sources, comprising US\$0.509 billion in grants and US\$0.354 billion in loans (Table 4.10). The assessment suggests the actual figure might be understated by at least US\$0.354 billion plus interest, considering loans as internally provisioned resources to be repaid.

Table 4.10: National government budget allocation for direct and indirect climate change adaptation and mitigation 2003-2009

SECTOR	2003/2004	2005/2006	2007	2008	2009
Agriculture	111,499,114	73,230,418	162,317,397	27,653,476	2,809,630
Biodiversity	7,569,465	8,998,284	14,558,654	10,495,298	17,903,435
Climate Change	22,380	24,309	40,675	278,065	1,074,457
Disaster Management	27,370,923	108,979,145	212,052,315	120,982,587	39,560,304

SECTOR	2003/2004	2005/2006	2007	2008	2009
Energy	2,180,018	12,258,564	18,354,608	5,824,319	4,722,783
Environment	18,558,100	32,475,436	32,131,740	9,452,328	38,315,848
Fisheries, Coastal & Marine Re- sources	32,094,041	8,066,836	5,921,398	18,371,834	12,472,826
Forestry	23,409,317	24,169,309	39,509,587	52,622,452	78,824,022
Land Use	12,356,882	36,364	36,846	10,270,101	5,691,065
Science and Technology	33,210	22,844,818	17,192,125	1,410,011	18,438,326
Water Supply and Sanitation	130,443	32,727	38,944	23,847	4,645,391
Total (As% of Total PH Budget)	235,223,893 (1,59%)	290,934,212 (1,76%)	502,154,288 (1,96%)	257,384,319 (0,93%)	224,458,087 (0,7%)

Source: CCC, 2011

In the Philippines, local financing for climate change adaptation and mitigation includes several key sources ([CCC, 2018, p. 7]):

- General Appropriations Act (GAA)
- People's Survival Fund (PSF)
- National Disaster Risk Reduction and Management Fund (NDRRMF)
- Local Disaster Risk Reduction and Management Fund (LDRRMF)

The CCC's 2019 analysis revealed that approximately 9% of the 2018 GAA, equating to PHP 283.34 billion (5.550USD), funded 319 climate-related activities, with a significant majority (97%) allocated for adaptation efforts, focusing on infrastructure like flood mitigation structures and drainage systems. Key mitigation initiatives included the National Greening Program and the expansion of mass transportation projects (CCC, 2018).

The PSF, aimed at supporting LGU-proposed adaptation projects, disbursed around PHP 328.9 million (6.4MUSD) by December 2018 for diverse projects from climate field schools to watershed management (CCC, 2018).

Meanwhile, the NDRRMF, primarily for disaster risk management activities, had disbursed PHP 4.922 billion by the end of 2018, though it's often stretched to cover post-disaster needs, revealing a gap in funding for preventative measures ([CCC, 2018]).

Local financing mechanisms also include the LDRRMF, funded by 5% of LGU revenue, and the local development fund, sourced from foreign loans or grants ([CCC, 2018]). These funds are crucial for financing local development projects and infrastructure investments at the municipal level.

3.2. MULTILATERAL FUNDING UNDER UNFCCC SCHEME

The Philippines faces significant challenges in accessing climate change-related financing, skewed towards mitigation despite its low GHG emissions. The lack of clear policies on climate finance hinders fund access from UNFCCC institutions like the GCF, leading to reliance on other multilateral institutions and donor countries such as Germany, Japan, Australia, and Korea (CCC, 2012, p. 45). Efforts to enhance fund accessibility include collaboration between the CCC and various institutions to develop funding-conducive concepts, leading to a readiness grant from Germany under UNDP for USD 1,335,180 in 2016, which supported the establishment of systems within the NDA and stakeholder engagement in project proposal development (CCC, 2019, p. 2).

Key initiatives by the CCC to leverage GCF funding include:

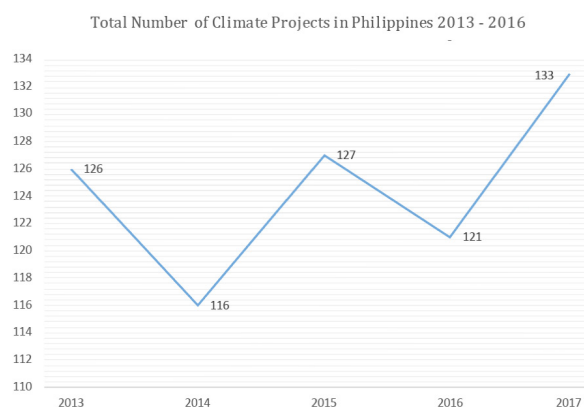
- Establishing a TWG for the GCF
- Developing a SET for assessing funding proposals
- Formulating a GCF Country Program outlining investment priorities
- Supporting the Land Bank of the Philippines' accreditation as a direct access entity
- Developing a funding proposal for coastal resilience (CCC, 2019, p. 2).

Ongoing GCF-supported projects focus on green finance pathways, strengthening NDAs, supporting Direct Access Entities, and developing National Adaptation Plans, with a notable USD 3M for the latter (CCC, 2019, p. 3). Additionally, the CCC has established the CFSS to enhance access to quality climate finance and support financial allocation for climate-related initiatives, announced on May 16, 2019.

3.3. LOAN AND GRANT

Climate finance in the Philippines, heavily reliant on loans (93% or USD 2.05 billion), faces challenges due to insufficient support from multilateral UNFCCC institutions and developed countries like those in the Paris Agreement. Grants, a mere USD 152 million, focus on institutional capacity and Typhoon Haiyan's recovery. From 2013 to 2017, the Philippines saw 623 climate change projects totaling USD 4.34 billion, with annual distributions ranging from 116 to 133 projects (Care, Accord, sustainable, & resilience, 2020, p. 14).

Figure 4.16: Total Number of Climate Projects in the Philippines 2013-2017

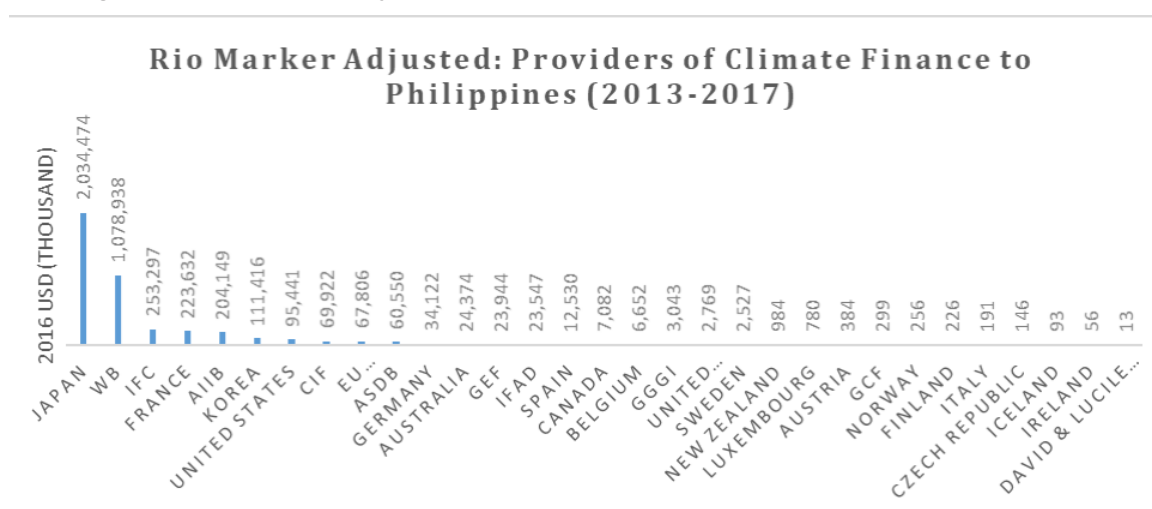


Source: *Adaptation Finance Tracking report: The Philippines (2020)*

From 2013 to 2017, the Philippines received 4.3 billion USD in climate-related finance across 623 projects. Japan emerged as the most substantial contributor, providing 47% (approximately 2.03 billion USD) of the total funding through 94 projects. Noteworthy projects funded by Japan include the “Cavite Industrial Area Flood Risk Management Project” in 2017 (50.9 million USD) and the “North-South Commuter Railway Project” in 2015 (823.5 million USD), the latter being the single largest investment in the period. Following Japan, contributions came from the World Bank (WB), the International Finance Corporation (IFC), France, the Asian Infrastructure Investment Bank (AIIB), and Korea, with the Netherlands and Denmark not contributing.

The distribution of projects and funding from these entities was significantly lower than Japan’s, highlighting a concentration of climate finance from a few primary sources. The WB committed 352,109 thousand USD across four projects in 2014, with a notable project in 2015 receiving 497,822 thousand USD. France’s significant contribution was the “2nd Reform Phase End Local Coll” project in 2017, valued at 109.7 million USD. Korean commitments totaled 111.4 million USD over 58 projects, with a major adaptation project in 2013 receiving 95 million USD, accounting for 85% of Korea’s total contributions. This analysis underscores the varied landscape of climate finance in the Philippines, which heavily relies on a select group of financiers (Care, Accord, sustainable, & resilience, 2020, p. 15).

Figure 4.17: RIO Market Adjusted: Providers of Climate Finance to Philippines (2013-2017)



Source: *Adaptation Finance Tracking report: The Philippines (2020)*

Several climate-related projects in the Philippines for 2013-2017 are presented in Table 4.11 below. Some of the project funding comes from loans, others from grants, which come from multilateral institutions and donor countries.

Table 4.11: List of Climate-related Projects Assessed

Project name	Abbreviation	CRS ID	Climate-related commitment reported to the OECD (USD thousand)	Financial instrument	Short description
World Bank: Second Disaster Risk Management Development Policy Loan with a Catastrophe-Drawdown Option	WB DPL CAT-DDO	2015029049	497,822	Loan	Second Disaster Risk Management Development Policy Loan with a Catastrophe- Drawdown Option (WB DPL CAT-DDO) is an ongoing 500 Million USD project aimed at enhancing technical and financial capacity of the Government of the Philippines to reduce disaster risk and manage socio-economic and fiscal impact of disasters.
Japan: Post Disaster Standby Loan	JPN Standby Loan	2014003040	470,344	Loan	Post Disaster Standby Loan (JPN Standby Loan) is a 470 Million USD project from Japan.
AAIB: Manila Flood Prevention	AIIB Manila Flood	2017000013	204,149	Loan	Manila Flood Prevention (AIIB Manila Flood) is a co-funding project with the World Bank aimed at improving the flood management in selected areas of Metro manila. The project co-finances the World Bank Metro Manila Flood Management Project.
World Bank: Metro Manila Flood Management Project	WB MM Flood	1. 2017027287 2. 2017027290	188,948	Loan	Metro Manila Flood Management Project (WB MM Flood) is loan project through the World Bank. The objective of the project is to improve the flood management in selected areas of Metro manila. The project is co-financed by the AIIB Manila Flood Prevention Project (Project 3) and the Government of the Philippines.
Japan: Cavite Industrial Flood Risk Management Project	JPN Cavite FRMP	1. 2017003086 2. 2017003087	146,792	Loan	Cavite Industrial Flood Risk Management Project (JPN Cavite FRMP) is a loan from the Japanese Government. The objective of the project is to mitigate flood risk through the construction of flood protection measures in Cavite Province, thereby contributing to sustainable and stable economic development in the area.
Japan: Non-revenue water improvement in the west zone of Metro Manila (1)	JPN Non-revenue Water (1)	2017003500	120,259	Loan	Non- revenue water improvement in the west zone of Metro Manila (1&2) (JPN Non-revenue Water) is a loan from the Japanese Government. The project aims to achieve an efficient water supply with little water loss by supporting non-revenue water improvement programs.

Project name	Abbreviation	CRS ID	Climate-related commitment reported to the OECD (USD thousand)	Financial instrument	Short description
France: Local Government Finance and Fiscal Decentralization (LGFFD) Program	France LGFFD	2017168300	109,688	Loan	Local Government Finance and Fiscal Decentralization (LGFFD) Program is a loan from the French Government. The objective of the project is to improve and balance the distribution of financial resources at local level, strengthen public finance management, and develop governance, transparency and accountability in local authorities.
Korea: The integrated Disaster Risk Reduction and Climate Change Adaptation (IDRR-CCA) measures in the Low-lying areas of Pampanga Bay Project	Kor IDRR-CCA	2013002143	95,007	Loan	The Integrated Disaster Risk Reduction and Climate Change Adaptation (IDRR-CCA) measures in the Low-lying areas of Pampanga Bay Project (KOR IDRR-CCA) is a 94 Million USD loan from the Korean government. The project aims to protect life and minimise damages to properties from perennial flooding in the area.
Japan: Flood Risk Management Project for Cagayan de Oro River	JPN FRMP-CDOR	2015003020	106,686	Loan	Flood Risk Management Project for Cagayan de Oro River (JPN FRMP-CDOR), 104 M USD loan from the Japanese Government. The objective of the project is to strengthen the resilience of the communities along the Cagayan de Oro River stretch from the Macajalar Bay to the Pelaez Bridge to climate change and other hydro-meteorological hazards by mitigating flood risk.
EU: Access to Sustainable Energy in the Philippines Programme	EU ASEP	2014000321	67,806	Grant	Access to Sustainable Energy in the Philippines Programme (EU ASEP) is a grant provided by the European Union. The programme aims to assist the Government of the Philippines in expanding its sustainable energy generation to meet the growing needs of its economy and provide energy access to the poor and marginalised in accordance with the Philippine Development Plan.

Project name	Abbreviation	CRS ID	Climate-related commitment reported to the OECD (USD thousand)	Financial instrument	Short description
France: Integrated Flood Risk Management Sector Project	France IFRM Project	2016104600	55,291	Loan	Integrated Flood Risk Management Sector Project (France IFRM Project) is a 55 Million USD loan project aimed at enhance disaster resilience by reducing flood risk in six river basins, namely: Apayao-Abulog and Abra in Luzon; Jalaur in Visayas; and Agus, Buayan-Malungon, and Tagum-Libuganon in Mindanao), through strategic and community-based flood risk management (FRM).
Japan: The Programme for Rehabilitation and Recovery from Typhoon Yolanda	JPN Yolanda	2014010013	43,272	Grant	The Programme for Rehabilitation and Recovery from Typhoon Yolanda (JPN Yolanda) is a 46 Million USD grant provided by the Japanese government. The objective of the project is to comprehensively support the process of recovery and reconstruction of the areas affected by Typhoon Yolanda and the formulation of a disaster resilient nation/society, taking lessons learned from past disasters in Japan into consideration.
Japan: Non-revenue water improvement in the west zone of Metro Manila (2)	JPN Non-revenue Water (2)	2017003506	29,586	Loan	Non-revenue water improvement in the west zone of Metro Manila (1&2) (JPN Non-revenue Water) is a loan from the Japanese Government. The project aims to achieve an efficient water supply with little water loss by supporting non-revenue water improvement programs.
IFAD: Fisheries, Coastal Resources, and Livelihood Project	IFAD Fisheries CoRaL	2015300169	29,825	Loan	Fisheries, Coastal Resources, and Livelihood Project (IFAD Fisheries CoRaL) is a 29.9 Million USD loan from IFAD. The project aims to reduce poverty in the target coastal communities by ensuring that the coastal communities sustainably manage their fishery and coastal resources.
Germany: Typhoon Yolanda Reconstruction Program	Germany Yolanda	2014001089	14,860	Grant	Typhoon Yolanda Reconstruction Program (Germany Yolanda) is a 5.9 Million USD grant from the German Government.

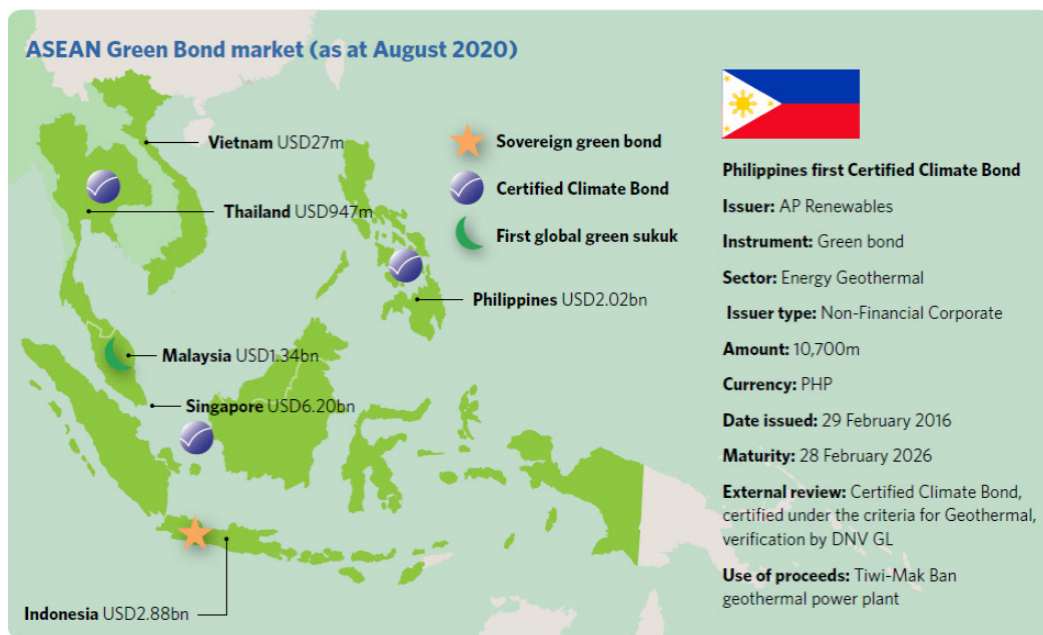
Project name	Abbreviation	CRS ID	Climate-related commitment reported to the OECD (USD thousand)	Financial instrument	Short description
Aus: Philippine Social Protection: Community-led classroom and daycare construction	Aus-Social Protection	2014000104	9,181	Grant	Philippine Social Protection: Community-led classroom and daycare construction (Aus- Social Protection) is a 11 Million USD grant from the Australian Government. The project objective is to improve access of targeted poor communities to early childhood learning activities by supporting the construction and rehabilitation of classrooms and daycare centres.
USA: Pacific-American Climate Fund-Clean Productive Environment	USA Pac-Am Climate Fund	2014030164	10,898	Grant	Pacific-America Climate Fund-Clean Productive Environment (USA Pac-Am Climate Fund), grant 7.6 Million USD from US Government. The project aims to provide grants to civil society organizations to reduce long-term vulnerabilities associated with climate change.
Japan: TC Aggregated Activities	JPN TC Aggregate	2014950936	6,832	Grant	TC Aggregated Activities (JPN TC Aggregate) is a technical assistance grant from the Japanese Government
Assessed climate-related commitments (thousand USD)			2,207,282		
Total climate-related commitments 2013-2017 (thousand USD)			4,343,643		
Assessed finance as a percentage of total received climate finance commitments			51%		

Source: *Adaptation Finance Tracking Report: The Philippines (2020)*

3.4. PHILIPPINES GREEN BOND

The Philippines is proactively advancing its sustainable finance framework by utilizing green debt and equity instruments, such as green bonds and loans, alongside enhancing credit support mechanisms. It stands as a leader in Southeast Asia for green bond issuance, with its inaugural issuance by AP Renewables in 2016 valued at 10,700 million. As of 2020, the country has issued green bonds totaling USD2.02 billion, contributing to Southeast Asia's growing green finance landscape, as depicted in Figure 4.18. This compares to Indonesia's USD2.88 billion, Singapore's USD6.02 billion, Malaysia's USD1.34 billion, Thailand's USD947 million, and Vietnam's USD27 billion in green bond issuances.

Figure 4.18: ASEAN Green Bond market (as of August 2020)



Source: Philippine GIIO Report (2020)

Since then, green bond issuance in Southeast Asia has grown rapidly, as shown in Figure 2.19. The growth of the green bond market in the Philippines is mainly driven by the private sector (Climate Bond Initiative, ACGF, ADB, & Philippines, 2020, p. 13).

Figure 4.19: Philippine Sustainable Bond Issuance (in USD million)

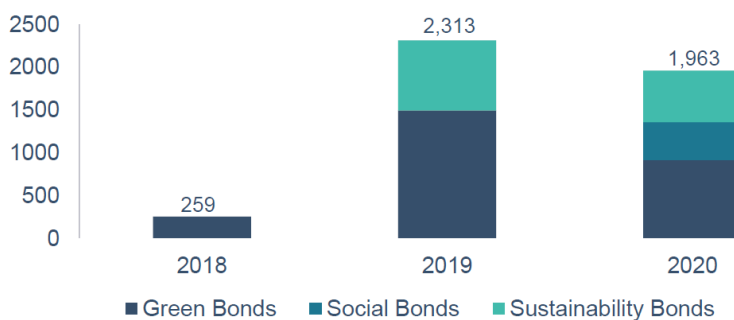


Figure 11. Philippine Sustainable Bond Issuance (in USD million)

²² BloombergNEF

Source: The Philippine Sustainable Roadmap (2021)

In 2016, the Philippine green bond market was initiated by Aboitiz Equity Ventures, issuing bonds worth USD 220.4 million. The market witnessed subsequent growth with BDO Unibank and China Banking Corp issuing green bonds in 2017 and 2018, respectively. By 2019, the issuance expanded to include financial corporations, BPI and RCBC, and non-financial corporations like Ayala Corporation. 2020 saw further diversification, with non-financial corporations such as Arthaland, Ayala Corporation again, and Manila Water Company entering the green bond market. As of August 2020, more than USD 2.6 billion in green bonds had been

issued in the Philippines, primarily in 2019, supporting various sustainable initiatives. Notably, RCBC's green bonds attracted significant investor interest, partly due to the International Finance Corporation (IFC) support. Furthermore, Arthaland and AC Energy's 2020 issuances emphasized green buildings and renewable energy, respectively (Climate Bond Initiative, ACGF, ADB, & Philippines, 2020, pp. 12-13).

Table 4.12: Philippines green bond issuance

Issuer	Amount	Issue Date	Issuer Type	Use of Proceeds
Manila water Company Inc	USD500m	Jul-20	Non-Financial Corporate	Water
Ayala Corporation (AC Energy Finance International Ltd)	USD60m	Jun-20	Non-Financial Corporate	Energy
Arthaland	PHO3bn (USD61.8m)	Feb-20	Non-Financial Corporate	Buildings
Ayala Corporation (AC Energy Finance International Ltd)	USD400m	Dec-19	Financial Corporate	Energy
BPI	CHF100m (USD108.6m)	Aug-19	Financial Corporate	Energy, Buildings, Water, Waste
BPI	USD300m	Sep-19	Financial Corporate	Energy, Buildings, Water, Waste
Ayala Corporation (AC Energy Finance International Ltd)	USD110m	Feb-19	Non-Financial Corporate	Energy
RCBC	PHP15bn (USD309m)	Feb-19	Financial Corporate	Energy, Buildings, Transport, Waste
Ayala Corporation (AC Energy Finance International Ltd)	USD75m	Jan-19	Non-Financial Corporate	Energy
Ayala Corporation (AC Energy Finance International Ltd)	USD225m	Jan-19	Non-Financial Corporate	Energy
China Banking Corp	USD150m	Oct-18	Financial Corporate	Energy, Buildings, Water, Waste
BDO Unibank	USD150m	Dec-17	Financial Corporate	Energy, Buildings, Water
Aboitiz Equity Ventures (AP Renewables)	PHP10.7bn (USD220,4m)	Feb-16	Non-Financial Corporate	Energy

Source: *The Philippine Sustainable Roadmap (2021)*

Reliance on non-concessional loans and market-interest rate loans raises concerns about the alignment with climate finance’s core objectives, which aim to assist low-income countries vulnerable to climate change impacts by mobilizing \$100 billion annually through predominantly grant-based support.

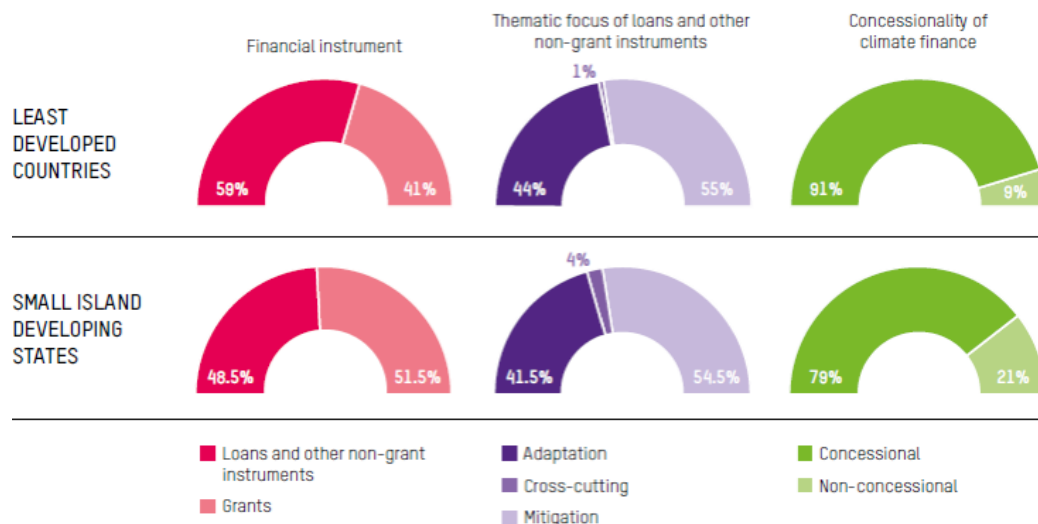
CHAPTER V

CRITICISM OF CLIMATE FINANCE

Climate finance, aimed at compensating those most affected by climate change yet contributing the least, remains inadequately met by developed countries. Despite a 2009 pledge by wealthy nations to mobilize \$100 billion annually in climate finance from 2020 to 2025, projections indicate the target will be missed until 2023. The OECD reported that developed countries provided approximately \$80 billion in 2019, falling short of the commitment (OECD, 2021). Oxfam’s analysis suggests that the actual allocation will hover between \$93 billion and \$95 billion yearly through 2025, resulting in a cumulative shortfall of \$68 billion to \$75 billion for climate-vulnerable countries (Oxfam, 2021).

The OECD’s 2019 climate finance figure reached US\$ 79.6 billion without detailing actual disbursements (OECD, 2021). Aid Atlas highlighted that only 60.4% of climate-related development finance was disbursed between 2002 and 2018, indicating a discrepancy in the flow of funds (Aid Atlas, 2020). Oxfam’s interpretation of the OECD report emphasized that a minor fraction of climate-related development finance reaches the Least Developed Countries (LDCs) and Small Island Developing States (SIDS), with LDCs and SIDS receiving about 20.5% and 3%, respectively, primarily through loans and non-grant instruments (Oxfam & Grow, 2020, p. 20).

Figure 5.1: Estimated climate finance to LDCs and SIDS in 2017–18 by instrument, concessionality, and thematic focus of loans and non-grant instruments



Source: Oxfam & Grow (2020)

The OECD report highlights climate finance in Southeast Asia, with a focus on the government and international funding allocations towards climate change mitigation and adaptation efforts in Indonesia, Malaysia, and the Philippines:

- Indonesia finances 66% of its climate initiatives through the government budget, with the remaining 34% sourced from international public finance, predominantly in loan form (86%).

- Malaysia aims for a 45% reduction in greenhouse gas emissions by 2030, supported by 10% international assistance and 35% domestic funding. Despite slight improvements, the environmental sector’s budget allocation remains low at 0.66%, compared to the defense sector’s 4.2%. In contrast, the EU spends an average of 1.6% of its budget on environmental protection, with the Netherlands at 3.2%, and allocates about 30% of its COVID-19 recovery stimulus towards a green recovery (Mahadi & Joshi, 2020).

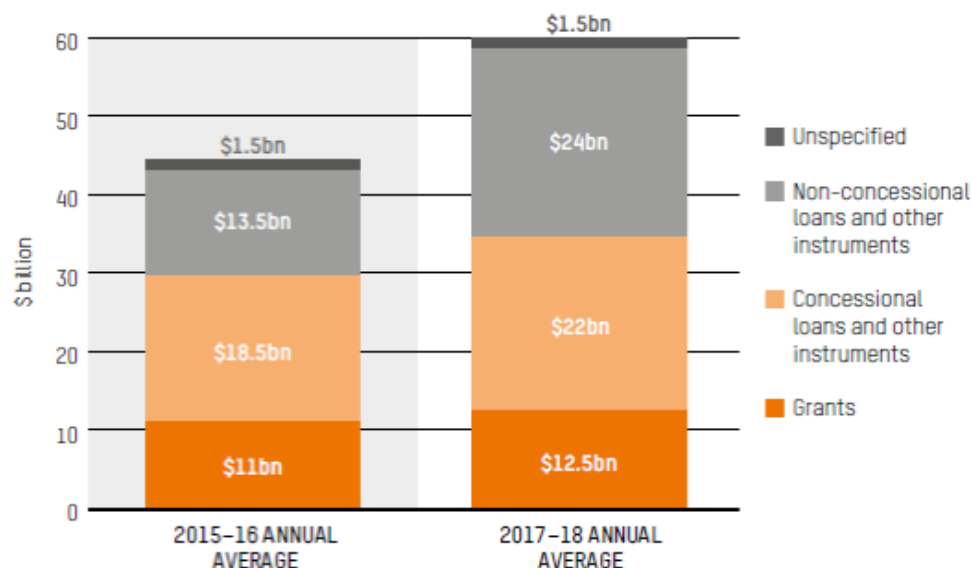
- The Philippines has significantly invested in climate-related activities domestically, with limited support from external bilateral and multilateral sources. Between 2004 and 2009, the government allocated US\$1.576 billion to climate change programs, while external sources provided a combined US\$0.863 billion in grants and loans (see Table 5.10).

Developing countries like Indonesia, Malaysia, and the Philippines must allocate substantial public funds to combat climate change. The UN Environment Program forecasts annual adaptation costs in developing countries will reach \$140 billion to \$300 billion by 2030 and \$280 billion to \$500 billion by 2050.

5.1. CLIMATE FINANCE IS INCREASING THE DEBT BURDEN

In 2017–2018, Oxfam reported that LDCs and SIDs received \$58.5 billion in public climate finance. Only 20%, or \$12.5 billion, was in grants, with the remainder comprising loans and other instruments. Specifically, \$22 billion was in concessional loans and \$24 billion in non-concessional loans. The nature of these finances remains unclear due to non-disclosure of loan terms.¹ (Oxfam & Grow, 2020, p. 14).

Figure 5.2: Estimated climate finance by instrument via bilateral and multilateral channels, 2017–18 and 2015–16 (annual averages)



Source: Oxfam & Grow (2020)

¹ non-concessional means these finances are not offered on terms cheap enough to qualify as ODA (Official Development Assistance). Donors are not required to report the terms of loans and other instruments, so the nature of these finances is unknown.

Non-concessional climate finance substantially increased from \$13.5 billion in 2015-2016 to \$24 billion in 2017-2018, marking roughly a 10% raise. A significant portion of this financing, around 70%, was contributed by the Multilateral Development Bank (MDB), with bilateral sources accounting for 16%. Notably, Spain, Japan, Germany, and France provided considerable portions of their climate finance through non-concessional means, with respective contributions of 55%, 24%, 22.5%, and 16%.

However, the reliance on non-concessional loans and market-interest rate loans raises concerns about the alignment with climate finance's core objectives, which aim to assist low-income countries vulnerable to climate change impacts by mobilizing \$100 billion annually through predominantly grant-based support. Between 2015-2016 and 2017-2018, grant-based support experienced a modest increase from \$11 billion to \$12.5 billion. Yet, less than half of the total grants were allocated to Least Developed States (LDS), with Small Island Developing States (SIDS) receiving approximately half.

This distribution pattern underscores a prevalent trend in climate finance, where loans and other non-grant instruments, often non-concessional, dominate. Such practices contribute to the growing unsustainable debt burden among low-income countries, exacerbating their financial challenges. The International Monetary Fund (IMF) has raised alarms over the potential for increased debt difficulties among low-income nations, reporting that 36 out of 73 countries are at high risk of debt distress.

This concern is particularly pronounced in Southeast Asia, where countries like the Philippines and Indonesia report substantial climate finance loans, constituting 93% and a significant portion of their climate commitments. These developments highlight the critical need to reevaluate climate finance strategies to better align with the principle of supporting vulnerable nations without compounding their financial vulnerabilities.

5.2. CARBON OFFSET IS A FALSE SOLUTION

The core mechanism for climate finance in low-income countries involves carbon offsets within carbon trading, regulated under the Kyoto Protocol, allowing developed countries to buy carbon credits from those with surplus emission quotas. The Protocol introduces two schemes: the Clean Development Mechanism (CDM) and the Joint Implementation Project (JIP), facilitating emission reduction projects in Non-Annex I countries, resulting in Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs), respectively. This carbon trade, critiqued by civil society organizations like WALHI (2021), is seen as a superficial solution, perpetuating emissions and enabling corporate and wealthy nations to avoid meaningful reduction commitments by disguising it as environmental action.

At COP 26, the emphasis on carbon offsets was critiqued for potentially increasing debt in developing countries rather than fostering genuine emission reduction. The debate highlights a division between rich countries and financial institutions favoring market-based solutions and developing nations advocating for a UNFCCC-led finance mechanism emphasizing differentiated responsibilities.

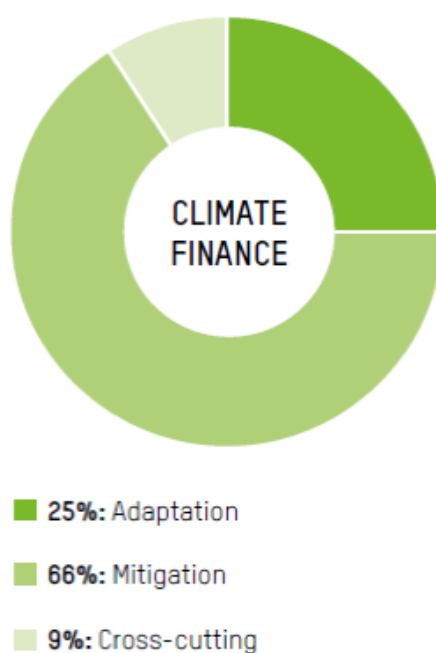
The REDDD program in Indonesia exemplifies challenges, with the Indonesia-Norway

cooperation ending due to unmet obligations, specifically the Result Based Payment (RBP) for emission reductions, notably a US\$ 5 per tonne CO₂eq rate for 11.2 million tons reduced in 2016/2017, promised but undelivered funds of US \$56 million by Norway as of 2020 end (Kementerian Luar Negeri, 2021).

5.3. PRIORITIZING MITIGATION, FORGETTING ADAPTATION

Adaptation and mitigation represent two distinct approaches to addressing climate change. Adaptation efforts aim to lessen potential disasters caused by climate change, such as floods and crop failures, while mitigation focuses on slowing global warming by reducing greenhouse gas emissions, for instance, through solar panel installations. The Paris Agreement calls for equitable distribution of climate finance between adaptation and mitigation, yet a significant bias exists toward mitigation, attributed to its perceived long-term financial benefits. According to an Oxfam report, public climate finance in 2017–2018 favored mitigation (66%) over adaptation (25%), with the remainder (9%) for cross-cutting initiatives (Oxfam & Grow, 2020, p. 17).

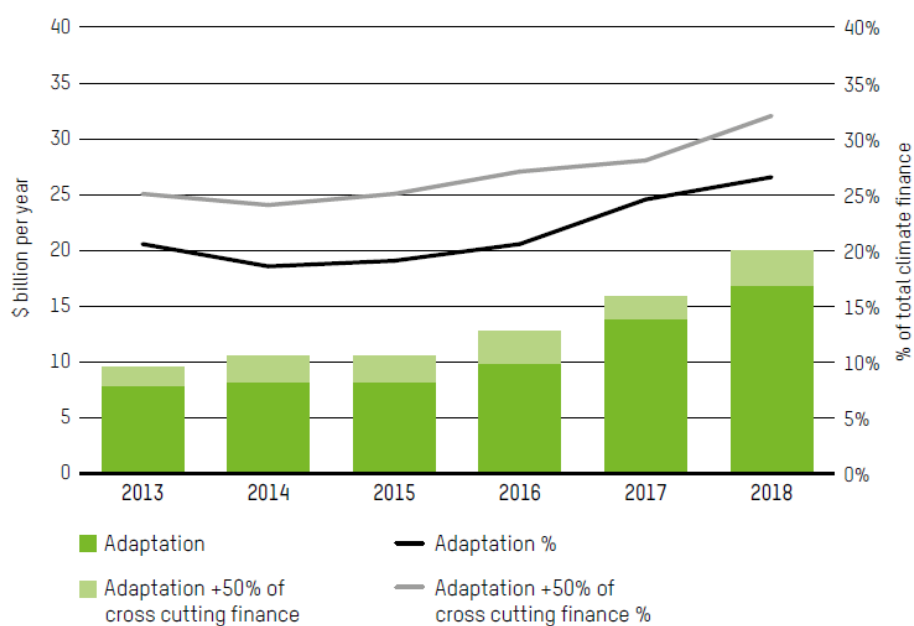
Figure 5.3: Global shares of mitigation, adaptation, and cross-cutting finance in 2017-2018



Source: Oxfam & Grow (2020)

According to the 2018-2019 OECD climate report, climate finance allocation was \$40 billion, with 39% for mitigation and 25% for adaptation, significantly lower than the UN Environment Program’s annual adaptation cost estimate for developing countries at \$70 billion, potentially rising to \$140-300 billion by 2030 (Gabbatiss, 2021). The preference for mitigation funding is due to its profitability and loan-based financing. Despite this, adaptation funding increased from \$9 billion in 2015–2016 to \$15 billion in 2017–2018, as illustrated in Figure 5.4.

Figure 5.4: Share and volume of adaptation finance, 2013–18



Source: Oxfam & Grow (2020)

The evolution of adaptation funds from 2015-2018 is notable, with a significant increase in contributions from donor countries like the Netherlands, the UK, Sweden, Switzerland, the European Commission, and the European Development Fund. Despite progress, France and Germany acknowledge the need for further efforts towards balanced allocation. Other nations, including Australia (0% to 6%), Japan (8% to 11%), Spain (9% to 11%), and Norway (6% to 8%), have seen modest increases in their contribution rates during the same period.

Table 5.1: Reported bilateral and multilateral adaptation finance by major country donors for 2015-2016 and 2017-2018 (annual averages)

Donor	2015-16		2017-18	
	Adaptation Only	Adaptation +50% Cross-Cutting	Adaptation Only	Adaptation +50% Cross-Cutting
Australia	0% (\$0m)	50% (\$111m)	6% (\$15m)	53% (\$127m)
Canada	35% (\$41m)	65% (\$75m)	20% (\$74m)	47% (\$170m)
Denmark	14% (\$26m)	44% (\$80m)	27% (\$60m)	46% (\$101m)
European Commission and European Development Fund	41% (\$956m)	54% (\$1.3bn)	41% (\$1.3bn)	59% (\$1.9bn)
France	17% (\$552m)	25% (\$805m)	19% (\$1bn)	30% (\$1.6bn)
Germany	16% (\$1.4bn)	23% (\$1.9bn)	20% (\$1.5bn)	30% (\$2.2bn)
Japan	8% (\$803m)	10% (\$1bn)	11% (1bn)	13% (\$1.3bn)
Netherlands	30% (163m)	62% (\$333m)	35% (197m)	62% (\$346m)

	2015-16		2017-18	
Norway	6% (\$31m)	11% (\$54m)	8% (\$51m)	12% (\$75m)
Spain	9% (\$50m)	17% (\$96m)	11% (\$45m)	36% (\$144m)
Sweden	38% (\$154m)	60% (\$243m)	37% (\$230m)	60% (\$373m)
Switzerland	31% (\$101m)	52% (\$167m)	39% (\$133m)	56% (\$194m)
UK	21% (\$343m)	49% (\$819m)	40% (\$547m)	49% (\$670m)
US	US Fourth Biennial report not submitted			


Source: Oxfam & Grow (2020)

Grants are crucial as adaptation funds, distinct from mitigation funds, are largely sourced from the private sector and multilateral financial institutions.² Adaptation relies heavily on donor grants, with minimal private sector contributions, about 3%. The current challenge lies in balancing funding for adaptation and mitigation, addressing the disparity that jeopardizes climate resilience efforts.³

Adaptation funding, deemed insufficient, should be prioritized to enhance community protection against climate change. The push for greater grant-based support underscores the urgency in rectifying funding imbalances to benefit vulnerable populations.

² Multilateral Financial Institutions and the private sector tend to see mitigation as related to investment projects that can generate profits, where the provision of mitigation funds is carried out through loan schemes.

³ There is an urgent need to increase grant-based support for adaptation, which so far has been deemed too small.



Grants are crucial as adaptation funds, distinct from mitigation funds, are largely sourced from the private sector and multilateral financial institutions. Adaptation relies heavily on donor grants, with minimal private sector contributions, about 3%. The current challenge lies in balancing funding for adaptation and mitigation, addressing the disparity that jeopardizes climate resilience efforts.

CHAPTER IV

CONCLUSION

The commitment of rich countries to provide \$100 billion annually to LDCs and SIDS is crucial for mitigating climate change's severe impacts. In 2020, climate-related disasters affected 98.4 million people and caused \$171 billion in economic losses. Annually, extreme temperatures contribute to five million deaths, a figure expected to rise with climate change, which could double economic losses compared to the pandemic. Yet, the urgency to address climate change is lacking, illustrated by the \$15 trillion spent by major economies on COVID-19 recovery, vastly overshadowing the climate finance goal. Military expenditure also significantly exceeds this goal, with a 2.6% increase to almost \$2 trillion in 2020.

Despite some nations, including the US, Canada, and Germany, pledging to narrow the climate finance gap, efforts by others like France, Australia, and Japan remain insufficient. Notably, many commitments are in loan form, limiting their effectiveness. The report highlights the urgent need for increased, grant-based climate finance contributions to address this critical global challenge.

6.1. RECOMMENDATIONS

The current UNFCCC climate finance scheme, which leans towards market mechanisms involving capital owners like international financial institutions and the private sector, poses additional challenges for developing countries with weak bargaining positions. These countries are compelled to rely on loans, exacerbating their vulnerability. This situation overlooks the significant responsibility of wealthier nations and major corporations for their historical emissions contributions. The accumulated 'ecological debt' from such emissions by rich countries and corporations from the 1800s to 2008 totals approximately US \$24 trillion.

To address these inequities, a reformation of the climate finance framework is essential, proposing the following recommendations:

1. Increase Grants, Eliminate Debt

- Emphasize grant-based climate finance from developed to developing countries as a repayment of 'ecological debt'.
- Commit all donors to enhance grant-based public climate finance, especially for LDCs and SIDs, and cancel debt during climate crises.

2. Increase the Adaptation Fund

- Ensure a minimum of 50% of climate finance contributions are allocated to the adaptation fund by 2022.
- Establish a new global public finance goal specifically for adaptation starting in 2025.

3. Carbon Tax and Environmental Damage

- Rich countries should commit to developing new finance sources, including environmental damage and production cost taxes on large corporations.

4. Transparency and Disclosure of Information

- Apply strict UNFCCC accounting standards, including project-by-project reporting, causality explanation, and avoiding double counting.

5. Expanding Participation

- Engage multi-stakeholders in climate finance decision-making, linking national policies with regional/local spending needs.

6. Safeguards in Climate Projects

- Implement safeguards in climate projects to protect community and indigenous peoples' rights, as agreed upon at COP 16 in Cancun, 2010.

REFERENCE

Aid Atlas. (2020, - -). All donors to all recipients for climate change (total) during 2002-2018. Retrieved December 3, 2021, from aid-atlas.org: https://aid-atlas.org/profile/all/all/climate-change-total/2002-2018?usdType=usd_disbursement

Alampay, E. A., & Torre, D. d. (2020, August 6). Financing In The Time of A Climate Emergency In The Philippines. Retrieved November 24, 2021, from sites.law.duke.edu: <https://sites.law.duke.edu/thefinregblog/2020/08/06/financing-in-the-time-of-a-climate-emergency-in-the-philippines/>

Alvarez, P. S. (2021, February 10). Climate Finance in the Context of the Philippines. Retrieved November 27, 2021, from unescap.org: https://www.unescap.org/sites/default/d8files/event-documents/Paola%20Alvarez_Climate%20finance%20in%20the%20context%20of%20the%20PH.pdf

Asian Development Bank. (2009). The Economics of Climate Change in Southeast Asia: A Regional Review. Manila: Asian Development Bank.

Badan Kebijakan Fiskal. (2018). Penyusunan Climate Budget Report 2016-2018. Jakarta, Indonesia: Badan Kebijakan Fiskal.

Begum, R., Abidin, R., & Pereira, J. (2011). Initiatives and Market Mechanisms for Climate Change Actions in Malaysia. *Journal of Environmental Science and Technology*, 4 (1), 31-40.

Beirne, J., Renzhi, N., & Volz, U. (2021). Bracing for the Typhoon: Climate Change and Sovereign Risk in Southeast Asia. Tokyo: Asian Development Bank Institute.

Buchner, B., Clark, A., Falconer, A., Macquarie, R., Meattle, C., Tolentino, R., et al. (2019). Global Landscape of Climate Finance 2019. Global: Climate Policy Initiative.

Burck, J., Hagen, U., Bals, C., Höhne, N., & Nascimento, L. (2021). Climate Change Performance Index 2021. Bonn: German Watch.

Burck, J., Hagen, U., Bals, C., Höhne, N., & Nascimento, L. (2021; 2020). Climate Change Performance Index 2021. Bonn: German Watch.

Burck, J., Hagen, U., Höhne, N., Nascimento, L., & Bals, C. (2020). Climate Change Performance Index 2020. Bonn: German Watch.

Burck, J., Uhlich, T., Bals, C., Höhne, N., & Nascimento, L. (2022). CCPI Background and Methodology. Berlin: German watch e.V, New Climate Institute, Climate Action Network-International.

Burck, J., Uhlich, T., Bals, C., Höhne, N., & Nascimento, L. (2022). CCPI Results 2022. Berlin: Germanwatch, NewClimate Institute, NewClimate Institute .

Care, Accord, sustainable, I. f., & resilience, p. f. (2020). Adaptation Finance Tracing Report: The Philippines. Manila: Care; Accord; Institute for climate and sustainable; partners for resilience.

CCC. (2012). National Climate Change Action Plan 2011-2028. Manila: Climate Change Commission.

CCC. (2019). Technical Workshop on Climate Finance In the Association of Southeast Asian Nations (ASEAN), Intervention from the Philippines

- Climate Change Commission. Quezon City: Climate Change Commission.
- CCPI, C. C. (2021, April). Philippines. Retrieved November 27, 2021, from ccpi.org: <https://ccpi.org/country/phl/>
- Chapman, A., Davies, W., & Downey, C. (2021). Climate Risk Country Profile: Malaysia. Washington: World Bank and Asian Development Bank.
- Climate Bond Initiative, ACGF, ADB, & Philippines, S. a. (2020). Green Infrastructure Investment Opportunities (Philippines). Manila: Climate Bond Initiative; ACGF, ADB, Sucerities and Exchange Commission Philippines.
- climate change commission. (2018). Climate Change and the philippines: executive brief. Manila: 2018-01.
- Corbin, J. a. (2008). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory (3rd ed.). California: Sage: Thousand Oaks.
- DJPPR. (2021). Laporan Kinerja Penyerapan Pinjaman, Hibah dan Project Based Sukuk. Kementerian Keuangan Republik Indonesia. Jakarta: Direktorat Jenderal Pengelolaan Pembiayaan dan Risiko.
- Eckstein, D., Kunzel, V., & Schafer, L. (2021). Global Climate Risk Index 2021. Bonn: German watch. Eckstein, D., Kunzel, V., Schäfer, L., & Wings, M. (2020). Global Climate Change Index 2020. Bonn: German Watch.
- ETC Group. (2017). Who Will Feed Us? The Industrial Food Chain vs The Peasant Food Web. Val David , Canada: 2017.
- Gabbatiss, J. (2021, October 25). Analysis: Why climate-finance 'flows' are falling short of \$100bn pledge. Retrieved December 7, 2021, from www.carbonbrief.org: <https://www.carbonbrief.org/analysis-why-climate-finance-flows-are-falling-short-of-100bn-pledge>
- Ibrahim, K., Shabudin, A. F., Koshy, K. C., & Asrar, G. R. (2016). A new framework for integrated climate finance and inclusive responses to sustainable development in Malaysia. *Geomatics, Natural Hazards and Risk* , 7 (6), 1754-1768.
- Ismail, F. (2020, October 20). Climate action in the Malaysian financial sector. Retrieved November 21, 2021, from bis.org: <https://www.bis.org/review/r201020f.pdf>
- Jacob, C. (2021, September 2). Southeast Asia could lose \$28 trillion if it fails to act fast on climate change, report finds. Retrieved September 20, 2021, from CNBC.com: <https://www.cnbc.com/2021/09/03/southeast-asia-could-lose-28-trillion-from-climate-inaction-deloitte.html>
- Kementerian Luar Negeri, R. I. (2021, September 10). Indonesia akhiri Kerja Sama REDD+ dengan Norwegia. Retrieved September 16, 2021, from kemlu.go.id: <https://kemlu.go.id/portal/id/read/2912/berita/indonesia-akhiri-kerja-sama-redd-dengan-norwegia>
- Kemitraan. (2021). Annual Report 2020. Jakarta: 2021.
- Maesaroh. (2021, September 10). Indonesia Setop Kerja Sama Emisi Gas Rumah Kaca REDD+ dengan Norwegia. Retrieved September 17, 2021, from katadata.co.id: <https://katadata.co.id/maesaroh/berita/613ba6657bf0c/indonesia-setop-kerja-sama-emisi-gas-rumah-kaca-redd-dengan-norwegia>
- Mahadi, A., & Joshi, D. (2020, November 14). Budget 2021: Will Malaysia keep up with the Global Green Economy Transition? Retrieved December 4, 2021, from www.isis.org.my: <https://www.isis.org.my/2020/11/14/budget-2021-will-malaysia-keep-up-with-the-global-green-economy-transition/>
- Mahardika, L. A. (2021, September 21). Perdana! Pemerintah RI Terbitkan Obligasi Global Bertema SDG 500 Juta Euro. Retrieved October 3, 2021, from Bisnis.com: <https://market.bisnis.com/read/20210914/92/1442096/perdana-pemerintah-ri-terbitkan-obligasi-global-bertema-sdg-500-juta-euro>
- McKinsey, G. I. (2020). Climate risk and response in Asia. McKinsey Global Institute.
- Ministry of Environment, a. F. (2021). Updated Nationally Determined Contribution Republic of Indonesia. Jakarta: Directorate General of Climate Change.
- Ministry of Environment and Water. (2020). Malaysia's Third Biennial Update Report To The UNFCCC. Kuala Lumpur: Ministry of Environment and Water.
- NDC, N. D. (2021, April 21). Communicated to the UNFCCC on 15 April 2021. Retrieved November 28, 2021, from <https://www4.unfccc.int/sites/ndc-staging/PublishedDocuments/Philippines%20First/Philippines%20-%20NDC.pdf>

- NDCs, N. D. (2021, July 30). MALAYSIA'S UPDATE OF ITS FIRST NATIONALLY DETERMINED CONTRIBUTION. Retrieved November 21, 2021, from UNFCCC.int: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Malaysia%20First/Malaysia%20NDC%20Updated%20Submission%20to%20UNFCCC%20July%202021%20final.pdf>
- OECD. (2021). Climate Finance Provided and Mobilised by Developed Countries Aggregate trends updated with 2019 data. OECD.
- Oxfam, & Grow. (2020). Climate Finance Shadow Report 2020 (assessing progress towards the \$100 billion commitment). Oxfam.
- Oxfam, I. (2021, September 20). Poorer nations expected to face up to \$75 billion six-year shortfall in climate finance: Oxfam. Retrieved December 2, 2021, from [www.oxfam.org](http://www.oxfam.org/en/press-releases/poorer-nations-expected-face-75-billion-six-year-shortfall-climate-finance-oxfam): <https://www.oxfam.org/en/press-releases/poorer-nations-expected-face-75-billion-six-year-shortfall-climate-finance-oxfam>
- Permana, E. H., Rulliadi, D., Syaifudin, N., Dharmawan, I., Hariyanto, J. T., Paramitha, Z. A., et al. (2019). Pendanaan Publik untuk Pengendalian Perubahan Iklim Indonesia 2016-2018. Jakarta: Badan Kebijakan Fiskal, Kementerian Keuangan.
- Pratomo, N. M. (2020, July 17). Pemerintah Terbitkan Sukuk Global US\$2,5 Miliar, Kelebihan Permintaan 6,7 Kali. Retrieved October 3, 2021, from Bisnis.com: <https://market.bisnis.com/read/20200617/92/1254067/pemerintah-terbitkan-sukuk-global-us25-miliar-kelebihan-permintaan-67-kali>
- ResponsiBank. (2018, Maret 6). Overview: Pembiayaan Perubahan Iklim di Indonesia. Retrieved September 16, 2021, from responsibank.id: <https://responsibank.id/berita/2018/overview-pembiayaan-perubahan-iklim-di-indonesia/>
- Ritchie, H., & Roser, M. (2021). CO2 emissions. Retrieved September 11, 2021, from ourworldindata.org: <https://ourworldindata.org/co2-emissions>
- Sesotyaningtyas, M., Mufida, S. F., Mahyastuti, P., Tri Utomo, E., Ngurah, A. A., Panduswanto, P., et al. (2021). Pendanaan Ketahanan Iklim. Jakarta: Kementerian Perencanaan Pembangunan Nasional/Bappenas.
- Susskind, L., Chun, J., Goldberg, S., Gordon, J. A., Smith, G., & Zaerpoor, Y. (2020). Breaking out of Carbon Lock-In: Malaysia's Path to Decarbonization. *Frontiers in Built Environment* , 6, 1-14.
- UNFCCC. (2016a). Report of the Conference of the Parties on its twenty-first session held in Durban from 28 November to 11 December 2011. Bonn: UNFCCC.
- USAID. (2017). Climate Risk Profile: Indonesia. Indonesia: USAID.
- WALHI, W. L. (2021, November 5). Menolak Solusi Palsu, Menuntut Keadilan Iklim. Retrieved December 6, 2021, from www.walhi.or.id: <https://www.walhi.or.id/menolak-solusi-palsu-menuntut-keadilan-iklim>
- Watson, C., & Schalatek, L. (2021). Climate Finance Regional Briefing: Asia. Washington, DC: Heinrich Böll Stiftung.
- Yap, J. T. (2021). Evaluating the Philippine Nationally Determined Contribution (NDC) in 2021. Manila: Ateneo School of Government.
- Yusuf, A., & Francisco, H. (2009). Climate Change Vulnerability Mapping for Southeast Asia. *Economy and Environment Program for Southeast Asia (EEPSEA)* , 1-24.