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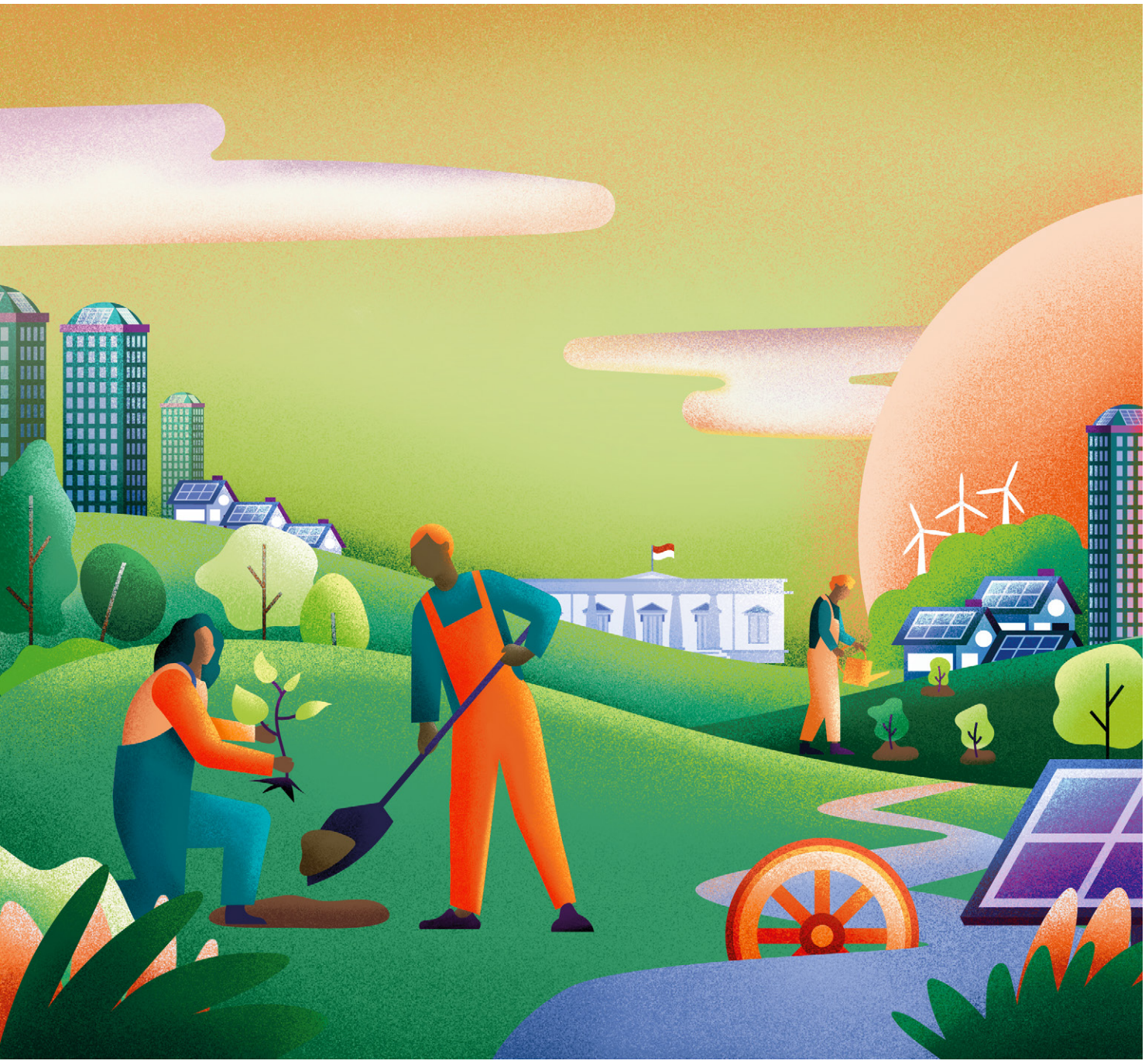
Indonesia

Enabling Conditions and Advantages of Synergy between Climate Change Adaptation and Mitigation to Stimulate Implementation of NDC



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About this report

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Project in brief
This report is a second-year study of a national study on adaptation by Climate Change Center ITB in collaboration with DIW Berlin under the project of Strengthening national climate policy implementation: Comparative Empirical Learning & Creating Linkages to Climate Finance (SNAPFI). This report analyzes the enabling conditions and advantages of sustainability and ICF opportunities of the synergy between climate change adaptation and mitigation to stimulate the implementation of NDC. It provides insights into how climate governance at national levels (in Indonesia) addresses the issue and utilizes its advantages and opportunities through PROKLIM, Social Forestry, and energy/ electricity.

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Glossary

ADB	Asian Development Bank
AE	Accredited Entity
AF	Adaptation Fund
AFOLU	Agricultural, Forestry, and Other Land Use
APBN	Anggaran Pendapatan dan Belanja Negara (State Budget)
AR	Assessment Report
BUR	Biannual Update Report
CBD	Convention on Biological Diversity
CCA	Climate Change Adaptation
CCC	Climate Change Control
CCM	Climate Change Mitigation
CDM	Clean Development Mechanism

COP	Conference of the Parties
COVID	Coronavirus Disease
CRP	Climate Resilient Pathways
CSR	Corporate Social Responsibility
DMC	Developing Member Country
DRM	Disaster Risk Management
EPIC	Economics & Policy Innovations for Climate-Smart agriculture
FAO	Food and Agriculture Organization
FPA	Fiscal Policy Agency
GCF	Green Climate Fund
GHG	Greenhouse Gases
GI	Governing Instrument
GoI	Government of Indonesia
GST	Global Stocktake
ICF	International Climate Finance
(I)NDC	Intended National Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
JAM	Joint Adaptation and Mitigation
JMA	Joint Mitigation Adaptation
LCDI	Low Carbon Development Indonesia
LDC	Least Developed Countries
LTS-LCCR	Long-Term Strategy for Low Carbon and Climate Resilience
MoEF	Ministry of Environment and Forestry
MoNDP	Ministry of National Development Planning
NDA	National Designated Authority
NDC	Nationally Determined Contributions
NGO	Non-Governmental Organization
NEK	Nilai Ekonomi Karbon (Carbon Economic Value)
NFP	National Focal Point
NOAK	Nordic Working Group for Global Climate Negotiations
NRE	New Renewable Energy
PFM	Performance Measurement Frameworks
PLN	Perusahaan Listrik Negara (State Electricity Company)
PROKLIM	Program Kampung Iklim (Climate Village Program)
REDD +	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RENSTRA	Rencana Strategis (Strategic Plan)
SDG	Sustainable Development Goals
SFEP	Social Forestry and Environment Partnership
SIEP	Sustainable and Inclusive Energy Program
SREAP	Sustainable and Reliable Energy Access Program
SRN	Sistem Registri Nasional (National Registry System)
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar

Chapter one

Introduction

1. Introduction

1.1 Background

The United Nations Framework Convention on Climate Change (UNFCCC) identifies two responses to address climate change impacts. First is an adaptation (protection), an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects moderate harm or exploit beneficial opportunities (IPCC, 2001a). The second is mitigation (prevention), an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC, 2001b). The conclusion is that mitigation can reduce all positive and negative impacts of climate change, reducing adaptation challenges. While adaptation is more selective than mitigation, it can take advantage of positive impacts and reduce negative impacts (Goklany, 2005). However, though both are now necessary to address climate change issues, they remain different priorities.

Climate change mitigation (CCM) has dominated global climate change policy discourse, with climate change adaptation (CCA) largely considered a responsibility of individual countries (Ayers and Huq, 2009). While developed countries focus on CCM, CCA is essential for more vulnerable developing countries. This pattern may result from past beliefs that CCM is sufficient to be the first line of defense against climate change (van Noordwijk et al., 2011). The architecture of the international agreements also reflects this approach by setting absolute emission targets indicative under the UNFCCC and the Kyoto Protocol (Michaelowa, 2001).

Nevertheless, while the UNFCCC and the Kyoto Protocol concentrate overwhelmingly on CCM, a framework for CCA actions was set up within these legal frameworks (Burton, 2000; Verheyen, 2003). After being treated as a marginal option by scientists and decision-makers worldwide, CCA is now receiving more attention as a crucial part of a comprehensive global climate policy along with CCM (Smith, 1997; UNEP/IVM, 1998; Kates, 2000; IPCC, 2001a; Adger, 2001; Burton et al., 2002; Huq, 2002). Especially since three new funds were established in the second half of the sixth Conference of the Parties (COP6) to the UNFCCC in 2000 (Dang et al., 2003): a special climate change fund and a least developed countries (LDCs) fund under the Convention, and an adaptation fund (AF) under the Kyoto Protocol.

The special climate change fund will finance activities relating to climate change in the areas of CCA; technology transfer; energy, transport, industry, agriculture, forestry, and waste management; as well as activities to assist developing countries whose economies are highly dependent on income generated from fossil fuels in diversifying their economies (UNFCCC, 2001). The least developed countries' funds will support a work program for LDCs. The adaptation fund, operating under the Kyoto Protocol, will be financed from the „share of the proceeds" on the clean development mechanism (CDM) and other funding sources. However, the funding mechanism shows CCM still dominates over CCA. For example, CCM activities alone are 96% of global climate finance allocation (350 billion USD) in 2010/11 (Buchner et al., 2012; Schwarze et al., 2018).

For this reason, pursuing CCA and CCM in joint activities in climate change projects and policies is gaining prominence (Ravindranath, 2007; Wilbanks et al., 2003a) to gain attention to funding CCA. It then can already be seen in the latest climate change agreement (Article 5 of the Paris Agreement) that it encourages policy approaches such as joint mitigation and adaptation (JMA) to integrate sustainable management of forests. Furthermore, Article 2.1C related to financial flows also strongly encourages the Climate Resilient Pathways (CRP) concept that seeks to synergize CCA and CCM to enhance climate action implementation and emphasize the importance of CCA. However, matters related to the meaning of 'synergized CCA and CCM' here need further elaboration to guide parties of this Agreement to understand easily.

The climate change research community, development organizations, policymakers, NGOs, and practitioners on the ground use a wide range of terminology to describe synergies: links between (Verchot et al., 2007; Dang et al., 2003; Locatelli et al., 2011), the complementarity of (Mata and Budhooram, 2007), integration of (Wilbanks and Sathaye, 2007; Dang et al., 2003; Klein et al., 2003; Wilbanks et al., 2003b; Swart and Raes, 2007; Ayers and Huq, 2009), and interaction between CCA and CCM (Rosenzweig and Tubiello, 2007). However, from the various existing terminology, the authors believe that a more synergy approach to CCA and CCM would be desirable as it can be more effective and efficient (Dang et al., 2003; Klein et al., 2007) and also reduce trade-offs between the two (Kane and Shogren, 2000). Synergy can promote sustainable development more effectively, especially in developing countries (Dang et al., 2003; Swart and Raes, 2007), while more funding is also required, especially for CCA, to address the CCA and CCM actions appropriately, which is especially important for vulnerable developing countries (Duguma et al., 2014b).

This synergy approach's advantages align with the context in Indonesia. While CCM has a great potential in Indonesia from carbon sequestration through the existence of tropical forests as ecosystem services, there was a wealth of natural resources (tropical): clean energy (natural gas)/ renewable energy (solar, wind, micro-hydro, ocean waves). On the other side, there is a dilemma regarding CCA in Indonesia. As one of the countries most affected by climate change, Indonesia is more concerned about CCA. However, in terms of funding, CCA gets less attention with the budget allocation realization for CCA is only about 39% of the total budget (FPA, 2020a).

Whereas the overall financing needs for CCA are growing, within the 2021-2030 timeline USD 77.81 billion and then become USD 309.17 billion in the 2050 timeline based on estimates from NDC (Nationally Determined Contribution) Adaptation Roadmap (2020). Compare that to the current CCM needs of USD 281 billion to meet the conditional emission reduction targets between 2018-2030 according to Indonesia's Third Biannual Update Report (BUR) in 2021 and USD 294.97 billion for unconditional emission reductions based on estimates from NDC Mitigation Roadmap (2019).
For these reasons, the synergy of CCA and CCM can become a crucial issue in Indonesia. The synergies between CCA and CCM have a great potential to provide solutions to climate problems in Indonesia. First, synergies can encourage more sustainability in climate change action activities. As one of the vulnerable countries to climate change impacts, there are worries that climate change's impact threatens sustainability and hinders the achievement of Indonesia's NDC targets. Meanwhile, in the NDCs context, synergies will be a precondition for harvesting potential collaboration/integration and creating a more substantial alignment between CCA and CCM to deliver on climate targets and broader sustainable development goals (SDGs).

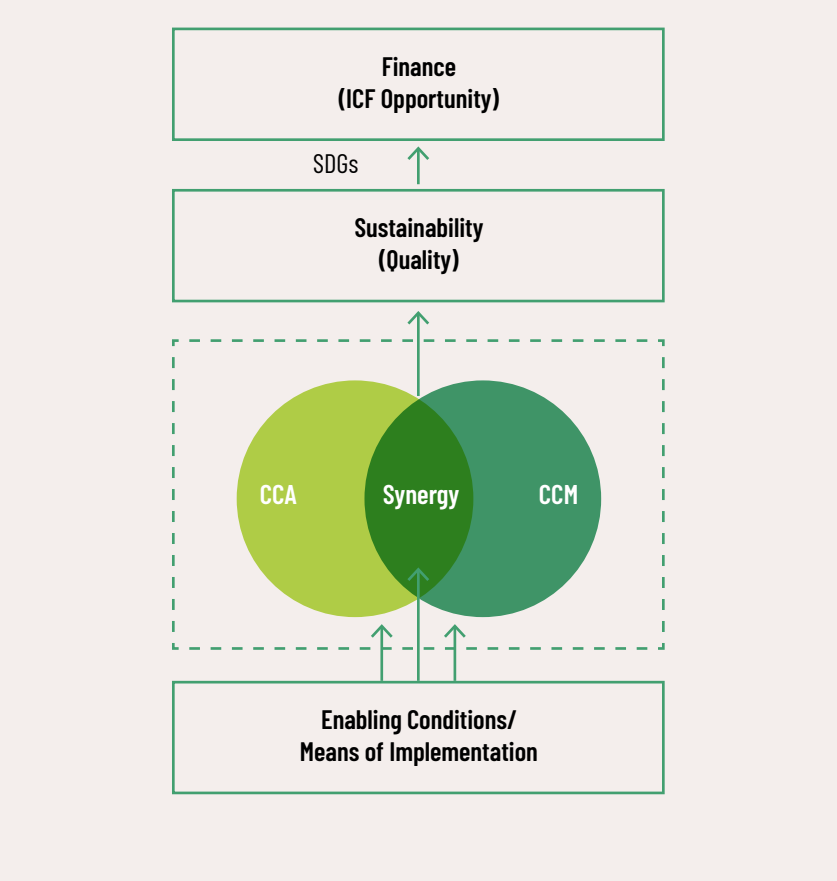
Second, it recognizes the need for balanced finance across CCA and CCM, and financial decisions recognize the importance of adequate and predictable finance. Therefore exploring the synergy between CCA and CCM becomes a potential issue in response to the adequacy and predictability of funding resources, especially the lack of financial support for CCA programs/activities in Indonesia to address the CCA and CCM actions appropriately. The synergy can also become a solution to make it cost-effective and time-efficient for NDC implementation. Thus, the synergy between CCA and CCM can stimulate the implementation of Indonesia's NDC. Therefore, this study aims to analyze the enabling conditions for synergy between CCA and CCM in Indonesia to improve the sustainability of the actions and open up international climate finance (ICF) opportunities to stimulate the implementation of NDC, with three main research questions:

1) To what extent is the progress of synergy issues between CCA and CCM internationally and in Indonesia?
2) What enabling conditions can encourage synergy between CCA and CCM in Indonesia?
3) Are there any advantages or benefits of addressing synergy between CCA and CCM in international climate finance (ICF) to stimulate the implementation of NDC?

1.2 General Research Framework

As described previously, in this report, we tried to understand the enabling conditions of synergy between CCA and CCM in Indonesia to stimulate NDC implementation through utilizing synergy advantages in the context of sustainability and ICF opportunities. Because it appears the issues of synergy between CCA and CCM are growing and becoming essential to encourage more sustainability (encouraging sustainability in climate change action activities). On the other side, there was a need for balance across CCA and CCM funds, especially the lack of financial support for CCA programs/activities in Indonesia. At the same time, synergy can be a solution for cost-effective and time-efficient NDC implementation. Therefore, those potentials are called the advantages of synergy issues that can be useful in stimulating the implementation of NDC Indonesia. With the research framework used in this study is shown in Figure 1.

Figure 1 Position of Synergy Issue in the Context of Sustainability and ICF



Source: Authors' analysis, 2022

Based on the research framework above, to gain these advantages from the synergy between CCA and CCM, there are needed means of implementation or enabling conditions to realize it. Therefore, this study attempts to apply this concept in the Indonesian context by analyzing the progress of synergy between CCA and CCM implementation in Indonesia through its enabling conditions from several programs or activities. After we have an overview of the progress of synergy implementation, we will also analyze the advantages achieved from implementing the synergy between CCA and CCM in the context of sustainability and ICF, which can be through SDGs and then open up funding opportunities based on the UNFCCC (AF and Green Climate Fund-GCF) to encourage the improvement of national climate governance and stimulate NDC implementation.

However, this study has a limitation on considering government/development as enabling condition for the synergy of CCA and CCM in terms of policy and finance, but not on considering the contribution of the synergy to government/development.

Chapter two

Literature Review

2. Literature Review

2.1 Forms of Interrelationship Between CCA and CCM

Attention to understanding the interrelationship between CCA and CCM to integrate them priorly began to surface when many developing countries realized that they now should not discuss whether to implement what measures to use against climate change. Rather how drastic these measures should be and how to design integrated climate policies that can go hand in hand with national sustainable development paths to maximize "win-win" opportunities (Dang et al., 2003; Pyke et al., 2007; Swart and Raes, 2007). Several studies suggest that national-level policies must address and recognize CCA and CCM interrelationships and explore the balance between the two (Klein et al., 2005; Stoorvogel et al., 2004; Berry et al., 2014; Landauer et al., 2015; Leonard et al., 2016). Further, several sectors have been studied regarding the potential interrelationship between CCA and CCM that can occur, including conservation (Di Gregorio et al., 2016; Locatelli et al., 2015), agriculture (Bryan et al., 2010; Palm et al., 2010; Kassam et al., 2012; Aguilera et al., 2013), agroforestry (Duguma et al., 2014a), or even AFOLU and REDD+ (de la Torre et al., 2009).

However, a dichotomy between CCA and CCM policies arises from several factors; these include differences in spatial, temporal, institutional, and administrative scales, as well as differences in research traditions and disciplines (Goklany, 2007; Swart and Raes, 2007; Wilbanks et al., 2007; Moser, 2012; Dymén and Langlais, 2013). Therefore, choices in integrating CCA and CCM will also vary according to each country's circumstances and each locality (Wilbanks, 2003b; De Boer et al., 2010). CCM benefits accrue globally, whereas the benefits of CCA tend to aggregate at the city and regional scales, encouraging policies ranging from the regional scale to even the building scale (Ayers and Huq, 2009; Balaban and de Oliveira, 2013). In terms of the temporal scale – due to feed-forward delays in the carbon cycle in the atmosphere – benefits from CCM measures are realized over longer time scales, while CCA has more short-term effects by reducing vulnerability to immediate and near-term climate risks (McEvoy et al., 2006; IPCC, 2007; Ayers and Huq, 2009).

Furthermore, CCM costs are typically local – although benefits are mainly global (although reductions in energy costs can also be local) – whereas CCA costs and benefits tend to be localized (Jones et al., 2007; Ayers and Huq, 2009). CCM and CCA policy formation and implementation are also conducted at different jurisdictional scales. CCA is mainly responsible for municipal-, provincial-, and national-level administrations, whereas national governments and supranational institutions are the legal governing institutions for CCM actions (Ayers and Huq, 2009; Ford et al., 2011). In more detail, the differences between CCA and CCM are described in Table 1.

Table 1 Main Differences Between CCA and CCM

	Climate Change Adaptation	Climate Change Mitigation
Sectoral focus	Selected at-risk sectors	All sectors that can reduce GHG emissions
Geographical scale of effect	Local, regional	Global
The temporal scale of effect	Short, medium, and long term	Long term
Effectiveness	Increases in climate resilience	Reduction in global temperature rise commitment
Ancillary benefits (or co-benefits)	Improve response to extreme events in the current climate	Multiple
Actor benefits	Almost entirely through reduction of climate impact and ancillary benefits	Through ancillary benefits
Polluter pays	Not necessarily	Yes
Monitoring	More challenging (needs metrics to measure the reduction of climate risk)	Relatively easy (measuring the GHG emissions reduction)

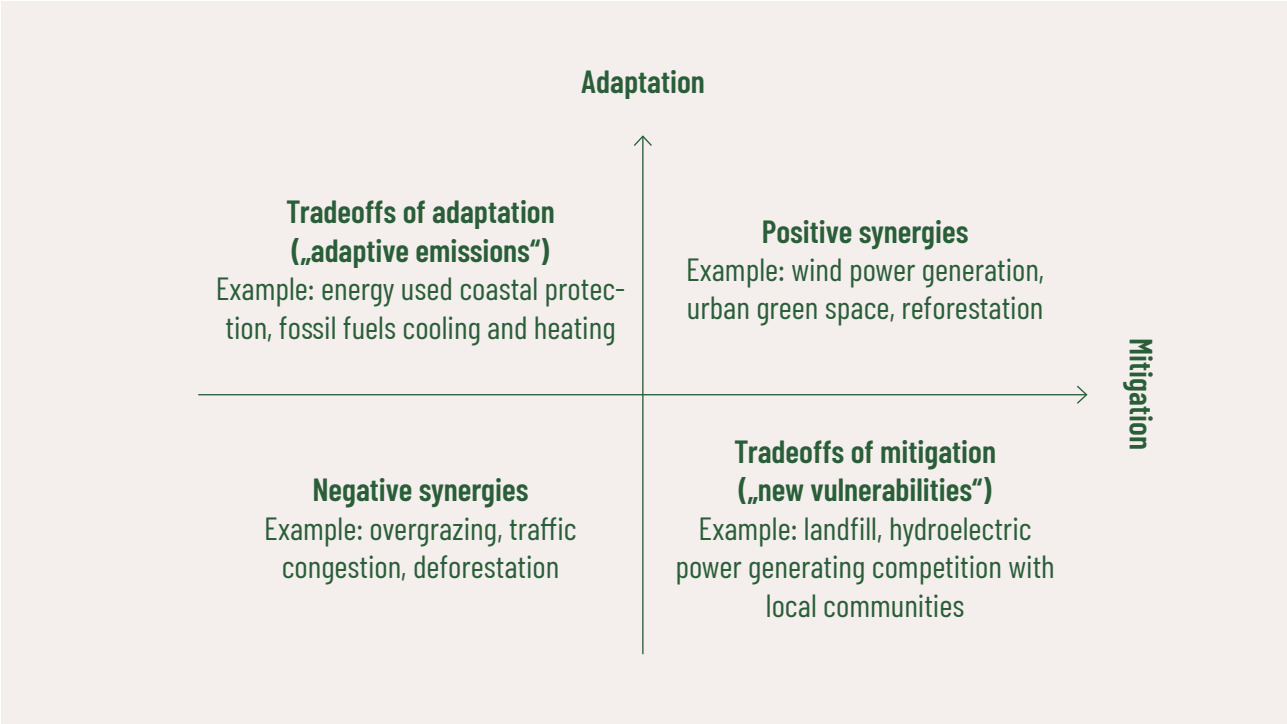
Source: Adopted from Dang et al., 2003

Based on the table above, the fundamental differences between CCA and CCM make CCA may be the highest priority in highly vulnerable countries because there are immediate benefits of reducing vulnerabilities to current climate variability and extremes and future climate changes. In contrast, CCA initiatives have often been seen as a lower priority in the case of developed countries because it is perceived that there is a sizeable adaptive capacity (Naess et al., 2005).

Further, while there is growing interest and encouragement in integrating CCA and CCM, it remains challenging to identify integration issues and opportunities and the drivers behind the two policies' decision-making approaches and implementation mechanisms (Grafakos et al., 2019). Swart and Raes (2007) suggest several factors that should be taken into consideration when evaluating combined CCA and CCM policy designs, including (1) avoiding trade-offs when designing policies for CCA and CCM; (2) identifying synergies; (3) enhancing response capacity; (4) developing institutional links between CCA and CCM, for example, in national institutions, and international negotiations; and (5) mainstreaming CCA and CCM considerations into broader sustainable development policies. Therefore, more understanding of these issues is needed to ensure that effective integration maximizes the synergies and minimizes the conflicts between CCA and CCM.

Several studies reflect the linkage between CCA and CCM options under the climate change regime as a "cause and effect" interaction, the more effective CCM is now, the less need for CCA in the future (Dang et al., 2003). There is also a clear link between CCA and CCM measures are interrelated–in some cases positively (synergy) and in others negatively (conflicts)–and sometimes implementation decisions are based on difficult trade-offs, requiring a choice between conflicting policies and planning objectives (Klein et al., 2007). Zhao et al. (2018) describe the positive and negative relationship between CCA and CCM in a quadrant shown in Figure 2.

Figure 2 Significance and Mechanism of Synergies and Trade-offs.



Source: Modified from Zhao et al., 2003

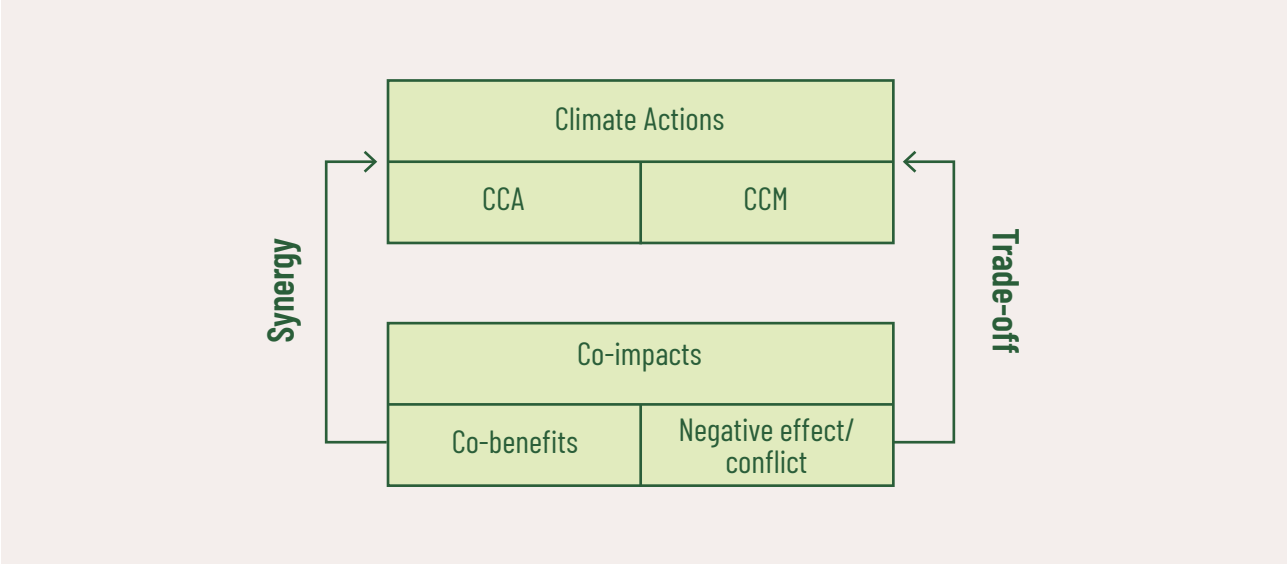
The top right quadrant represents a synergy, meaning CCA measures can reduce greenhouse gas (GHG) emissions simultaneously or if CCM action does not cause vulnerability in the region in the context of CCM. Essentially, the action of CCM (or CCA) positively affects CCA (or CCM). For example, reforestation activities increase carbon sequestration and regional adaptive capacity, creating a positive synergy effect.

While the top left and bottom right quadrants correspond to trade-off effects. The top left quadrant, trade-offs of CCA, is where adaptive actions bring "negative external effects" to CCM. It can be described as inappropriate CCA, which reducing or eliminating regional vulnerabilities can also lead to more GHG emissions, weakening the CCA effect. For example, to prevent seawater encroachment, dam construction increases the use of steel and cement, which are higher carbon emission goods, resulting in "adaptive emissions."

Further, the bottom right quadrant corresponds to trade-offs of CCM, where a CCM action enhances regional vulnerabilities or brings new vulnerabilities when reducing GHG emissions. In other words, the CCM leads to "negative external effects" on CCA, such as hydroelectric power generating competition with local communities in utilizing water (IPCC AR4 2007; Zheng, Wang, and Pan 2013; Fu, Zheng, and Wang 2014). The bottom left quadrant is the counter-example: "negative synergies." For example, traffic congestion causes an increase in GHGs and pollution, coupled with deforestation leading to a decrease in regional adaptive capacity and the loss of other carbon sinks.

Among its conclusions on the work on interrelationships between CCM and CCA, the Intergovernmental Panel on Climate Change (IPCC) stated that "significant co-benefits, synergies, and trade-offs exist between CCA and CCM and among different CCA responses, interactions occur both within and across regions and sectors" (IPCC, 2015). For this reason, the interrelationship between CCA and CCM can be shown in Figure 3 below.

Figure 3 Diagrammatic Representation of the Relationships Between Key Terminologies



Source: Modified from Chastin et al., 2021

Where there are several links between CCA and CCM, namely co-impacts, co-benefits, negative effects or conflict, synergy, and trade-offs, with a more detailed description of each of these interrelationships, among others:

a. **Co-impacts** happen when any CCA and/or CCM action or policy has non-climate-related impacts on society; it can be intentional when a policy or action takes them into account or unintended (Chastin et al., 2021).

b. **Conflict** is a plan, policy, strategy, or practical measure that counteracts or undermines planning goals between CCA and CCM (Grafakos et al., 2018). Conflict can appear when an attempt to integrate CCA and CCM results in urban planning failure or the two climate policies are in 'silos' which is not necessarily time and cost-efficient, especially in the long term (Walsh et al. 2011). Conflicts between CCA and CCM are often spatial, given that many of the CCA measures (such as water management practices using urban forestry and urban greening) require significant land area to be effective. Meanwhile, some CCM plans are poorly planned. Such efforts may undermine urban densification efforts that reduce transportation and energy demands, reducing the land area needed for CCA (Dymén and Langlais, 2013; Viguié and Hallegatte, 2012; Hamin Gurran, 2009).

c. **Co-benefit** is the positive effect a policy or measure may have on one goal on another, regardless of its net effect on overall social welfare. Co-benefits are often uncertain and depend on local

circumstances and implementation practices, among other factors (IPCC, 2014). It occurs when a plan, policy, or measure that aims to enhance a CCA objective simultaneously enhances the CCM objective or vice versa (Grafakos et al., 2019; Berry et al., 2015; Sharifi, 2021). This interrelationship can result in the cascade of the 'ripple effect' resulting from a climate policy or action, providing one co-benefit, which provides another, and so on (Chastin et al., 2021).

d. Synergy is described as the interaction of CCA and CCM so that the combined effect is greater than the sum of the effects when applied separately (Klein et al., 2007; Nordic Council of Ministers, 2017; Grafakos et al., 2018; Landauer et al., 2019; Zhao et al., 2018). Therefore, the synergy between CCA and CCM is an approach in which both actions are addressed without priority, especially in the context of systems thinking to address climate change issues (Duguma et al., 2014b).

e. Trade-off is a situation that requires choosing (balancing) between one or more desired, but sometimes conflicting, plans, policies, or strategies (Grafakos et al., 2018). Depending on the goals and priorities of CCA or CCM, trade-offs, i.e., 'balancing,' are required when beneficiaries and policy priorities differ between climate policies (Heidrich et al. 2013). It involves losing one quality or aspect to gain another quality or aspect. It represents the net impact of CCA and CCM activities (Klein et al., 2007). Trade-offs between CCA and CCM often appear when deciding on "hard" versus "soft" engineering and planning solutions. As well as in situations where the temporal scale of implementation sets limitations or uncertainties regarding planning horizons, availability of resources such as financing and staff, overall limits of authority, availability of expertise and data, and availability of physical space to implement integrated solutions (Jordan, 2009; Juhola et al., 2013; Dymén and Langlais, 2013).

Moreover, Grafakos (2019) provides examples, and an additional type of 'ripple effect' as shown in Table 2, illustrates the types of interrelationship above.

Table 2 Illustrative Examples of CCA and CCM Interrelationships

Type of inter-relationship	Action/measure	Primary objective	Interrelationship explained
Co-impacts	REDD+ program (Reduced Emissions from Deforestation and Forest Degradation plus conservation)	CCM	More wildlife diversity and carbon stock conservation can be achieved through the same budget if these two goals are pursued together
Conflict	Densification of urban structure	CCM	The dense urban structure that is key to reducing transportation and energy demands reduces green areas suitable for natural flood protection measures
Co-benefit	District heating and cooling system	CCM	District cooling can also be used in warm months to adapt to high temperatures
Ripple effect	Housing energy efficiency policy	CCA and CCM	Besides the climate context, it can help break the cycle of poverty through its impact on personal finances, improved physical and mental health, and increased attendance and performance in education for children and adults in the workplace. This will ultimately result in increased productivity for the economy and savings through reduced healthcare costs and benefits payments.
Synergy	Construction of green walls and rooftops	CCA and CCM	Green walls and rooftops increase the energy efficiency of buildings and decrease water runoff
Trade-off	Urban zoning	CCA and CCM	Challenges to setting priorities in urban planning due to space limitations in cities

Source: Modified from Grafakos et al., 2019

From these several types of interrelationships, it can be seen that synergies have the most attractive concept. Because it is essential to note that synergy between CCA and CCM is more significant than their parts, or the combined effect is greater than the sum of the activities if implemented separately (Udvardy and Winkelman, 2014). As is identified in the previous NOAK study on synergies (Illman et al., 2013), the concept of synergies is often taken to mean a range of different things, including links between, the complementarity of, integration with, co-benefit, added value, and interaction between, CCA and CCM.

Further reinforcing the concept, Leonard et al. (2016) define synergy as combined or 'co-operative' effects, the effects produced by things that operate together. Meaning that effects produced by the whole are more significant than the two parts operating alone (sometimes described using the "2+2=5"-metaphor). As well as Zhao et al. (2018) describe synergy as the effect of "1 + 1 > 2," that is,

the aggregation (effects) is greater than the sum of each part. Therefore the synergy in this study, as we summarized, is CCA and CCM activities that are possibly planned and implemented at the same location and in the same arrangement so that the combined effect is expected to be greater than the sum of the effects when applied separately.

However, in work on interrelationships between CCA and CCM, the IPCC (Klein et al., 2007) captures this critical type of synergy in their conceptual framework, which includes four different types of interaction. The first is CCA actions that have consequences for CCM (A→M). One of the forms is individual responses to climate hazards that increase or decrease GHGs. For example, a common adaptation to heat waves is installing air conditioning, increasing electricity demand with mitigating consequences when electricity is generated from fossil fuels. The second is CCM actions that have consequences for CCA (M→A). For example, CCM measures that transfer finance to developing countries (such as per capita allocations) that stimulate investment with CCA benefits.

Then the third is decisions that include trade-offs or synergies between CCA and CCM (∫(A, M)). These analysts are concerned with the explicit trade-offs between CCA and CCM, such as public sector funding and budgeting processes that allocate funding for both CCA and CCM. The last is processes that have consequences for CCA and CCM (A∩M). These concerns can be raised within the same decision framework or sequential process without explicitly considering their trade-offs or synergies. For example, monitoring systems and reporting requirements may include CCA and CCM indicators. Therefore, according to this typology, the true synergies between CCA and CCM are ∫(M, A). In other words, action must benefit both CCA and CCM to be labeled a synergy. The other three are complementary actions, which can have co-benefits (A→M and M→A) or side-effects stemming from actions in other areas (A∩M).

The interrelationships between CCA and CCM will vary with the type of policy decisions made, for example, at different scales, from regional project analysis to global analysis (Klein et al., 2007). There will be a clear M→A relationship across many CCM projects, for example, ensuring that CCA is incorporated into project designs. Similarly, in the design or appraisal of a CCA project, the CCM option may be included, for example, in considering reducing energy use in project design (A→M). The same M→A and A→M issues apply at the policy level (e.g., portfolio, funding, strategy), but the broader potential for cross-sectoral linkages makes simultaneous consideration of CCA and CCM (A∩M) more critical (Klein et al., 2007). For example, a significant shift in energy policy (country level) towards CCM may require assessing changes from CCA across various sectors. There may even be a need to consider some explicit trade-off between CCA and CCM (∫(A, M)).

Then, in many cases, synergies are also examined in a broader sustainable development context. Reference is often made to developing adaptive and mitigative or even response capacity (Klein et al. 2007, Swart and Raes 2007), climate compatible development (Mitchell and Maxwell, 2010), reducing vulnerabilities, seeking co-benefits with development policy and enabling sustainable livelihoods, and Climate Resilient Development (IPCC, 2022). In conclusion, it should be understood that synergies and trade-offs are between CCA and CCM actions and among the different CCA or CCM measures (Felgenhauer and Webster 2013). Finding and exploiting synergistic relationships can lower costs and help balance the dual objectives of CCA and CCM under limited resources (Fu, Zheng, and Wang 2014) to be more effective and efficient in tackling the impacts of climate change while promoting sustainable development.

2.2 Enabling Conditions for Synergy Between CCA and CCM

The details of specific CCA and CCM activities in the regions and sectors show that they can positively and negatively influence each other's effectiveness. These interrelationships (positive or negative) often depend on local conditions and national circumstances. While the topic has recently gained international policy recognition, the main challenge lies at the national (and sub-national) level despite increasing recognition in international policy and national-level implementation (Leonard et al., 2016). Little knowledge of how such approaches are applied "on the ground". Therefore, international policies are provided to assist countries in incorporating the enabling conditions necessary for synergistic design and implementation (Duguma et al., 2014; Leonard et al., 2016).

According to Grafakos et al. (2019), a city's capacity to undertake integrated actions for CCA and CCM is determined by structural conditions that provide the necessary opportunities or, on the contrary, impede and hinder integrated climate change action. Structural conditions define the current context and boundaries of a city's operating system. Structural conditions comprise the environmental and physical setting, institutions and governance, economic and financial conditions, and socio-cultural characteristics of a city. Structural conditions are difficult to change in the short run and often require coherent, continuous, and persistent action. To a large extent, structural conditions determine a city's vulnerability and capacity to adapt to climate change impacts and reduce GHG emissions.

Further, besides structural conditions, a wide range of urban actors (government, practitioners, public and private companies, the scientific community, and stakeholders from civil society such as boundary organizations) are also vital for effective planning and implementation and broad outreach during the preparation and execution of policies and actions including integrating CCA and CCM. Especially political leadership is needed that can often drive climate policy and determine its successful implementation (Burch, 2010; Johnson and Breil, 2012; Lesueur et al., 2015). For these reasons, stakeholder engagement and participation in the planning and decision-making process and information in all dimensions and forms (such as awareness-raising campaigns and education) are parts of the capacity needed. In addition, there is also a need for financial resources and mechanisms at all stages of policy development, project initiation, and implementation, along with planning and regulatory instruments. These resources and technical means at cities' disposal have to consider to overcome these barriers and better manage climate change challenges in an integrated manner.

While Grafakos et al. (2018) focus on the city level, Klein et al. (2005) and Duguma et al. (2014b) focus on the national level. Klein et al. (2005) point out that an analytical and institutional framework for monitoring the inter-relationships and organizing periodic assessments needs to be developed. Effective institutional development, financial instruments, participatory planning, and risk-management strategies are areas for learning from the emerging experience. Duguma et al. (2014b) also consider four primary enabling conditions. Unless such enabling conditions are prioritized, the accompanying inefficiency in tackling the problem of climate change will remain a challenge. The enabling conditions referred to include:

- Emphasis on integrated national laws, policies, and strategies.
- Existing and planned financial means and measures to promote synergies.

- Institutional arrangements in countries with particular reference to climate change issues
- International plans, programs, and initiatives.

The results of the formulation of enabling conditions by Duguma et al. (2014b) and Klein et al. (2005) align with this study that focuses on Indonesia's national climate governance to support the implementation of synergies between CCA and CCM. However, we also consider the resource and technical means proposed by Grafakos et al. (2018), considering that they are still in line with the scope of governance instruments, and synergies are generally implemented at the site scale. Therefore, based on the literature review results, we can conclude four enabling conditions for implementing the synergy between CCA and CCM.

The first is effective institutions and governance (stakeholders and political leadership). The first enabling conditions for synergy are improving the institution's coordination and cooperation in governance (across scales and sectors) or national-level committee or implementing body to address synergy issues between CCA and CCM. For synergy can happen, a wide range of urban actors (e.g., government, practitioners, public and private companies, the scientific community, and stakeholders from civil society such as boundary organizations) are needed for realizing effective planning and implementation—also broad outreach during the preparation and execution of policies and actions. Meanwhile, improving institutions and coordination and cooperation in governance can help overcome regional constraints associated with mitigation, adaptation, and disaster risk reduction.

Second, some standard or relevant guidelines as technical guidelines for implementing synergy between CCA and CCM. These standards or tools are needed to help understand interactions and support decision-making at local and regional scales. While third, there is a need for financial resources, more specifically, a common climate fund for CCA and CCM that combines various sources of funds. Because public-private partnerships and private-sector engagement are crucial means for financing climate change measures mainly related to capital-intensive, energy-efficient, and climate-resilient infrastructure, implementing different climate change actions (particularly the structural ones) can be costly. Therefore, a transparent budget allocation and financial commitment for financing climate actions are imperative for implementation.

The last is policy/planning/regulatory instruments (at any level) that encourage the implementation of synergy between CCA and CCM (e.g., CCM projects will be approved if they consider CCA or vice versa). It can be said that the previous supporting instruments will depend on policy/planning/regulations, which is a big umbrella for the implementation of synergies. As we know, CCA and/or CCM actions can be mainstreamed into existing sectoral plans and policies, whereas existing plans and actions in different sectors can incorporate climate change objectives. Actions can be implemented so that urban and infrastructure plans contain climate considerations (e.g., land use, transport, water, and sanitation). The provision of services (e.g., water, transport) can incorporate low-carbon and climate-proof regulations and specifications. In addition, a particular climate change unit can be created within the municipal structure to be held responsible for climate policy (within an existing unit or as a separate unit), or climate considerations can be mainstreamed into a range of municipal units. A standard policy or regulatory framework can also enhance the integration of CCA and CCM. Moreover, a standard implementation body could also ensure a more efficient combined CCA and CCM actions.

2.3 Advantages and Constraints of Synergies Between CCA and CCM

The synergy between CCA and CCM has severe advantages to be more explored for better climate change action implementation at the national level. Many authors suggested that a synergy approach for mitigation and adaptation (ʃ(M, A)) could be desirable as it can be more effective and efficient rather than as an afterthought (M→A and A→M) (Klein et al., 2007). The synergies between CCA and CCM can increase the cost-effectiveness and make them more attractive to stakeholders, including potential funding agencies (IPCC, 2007).

Atmospheric scientists widely agree that climatic changes' projected rate and magnitude can reduce GHG emissions (IPCC, 2001a). At the exact time, CCA costs and challenges can also be lessened by CCM (IPCC, 2001c). Therefore, the need for future adaptation is inextricably related to the current level of GHG emissions/CCM action (AfDB et al., 2002). Meanwhile, regarding funding-related issues, CCA has another particular link to CCM through the Kyoto Protocol adaptation fund (Article 12), mainly through Clean Development Mechanism (CDM). Therefore the more effective the CDM is, and the more used, the greater the funds that can be expected for CCA assistance (Burton, 2000).

In other words, the synergy between CCA and CCM can lower costs and help balance the dual objectives of CCA and CCM under limited resources, which is an urgent and practical problem for high emission and high vulnerability areas (Fu, Zheng, and Wang, 2014). For example, urban design can pay proper attention to climate-safe seating, energy-efficient building characteristics, and low transportation requirements. This activity will limit energy use and reduce exposure to the possible negative consequences of climate change in coastal areas or flooding areas (Swart and Raes, 2007). It can also be applied to the land use and forestry sectors. For example, reforestation can prevent flooding and erosion and absorb carbon emissions (Dang et al., 2003).

The synergy between CCA and CCM can also reduce trade-offs (Kane and Shogren, 2000). If CCA and CCM action can be more effective and efficient through this synergy concept, they can promote sustainable development more effectively, especially in developing countries (Dang et al., 2003; Swart and Raes, 2007). Synergies of CCA and CCM to sustainable development planning can optimize SDGs and tackle climate change. Linkages between CCA and CCM actions and sustainable development have also been addressed in the Convention, the Kyoto Protocol, and the Paris Agreement. In the Convention, for example, the relationship between CCM, CCA, and sustainable development has been initially reflected in Article 2. The article states that CCM action must be achieved within a sufficient timeframe to enable ecosystems to adapt naturally to climate change, ensure that food production is not threatened, and enable economic development to continue sustainably (United Nations, 1992).

In addition, under the commitments of the Convention, Parties should take into account climate change, to the extent possible, in relevant social, economic, and environmental policies and actions, and use appropriate methods, for example, impact assessments, formulated and determined nationally, to minimize adverse impacts on the economy, public health, and environmental quality, projects or actions taken by them to mitigate or adapt to climate change (United Nations, 1992). An example of linkage is the CDM under the Kyoto Protocol, which assists developing countries in achieving sustainable development and contributing to the Convention's ultimate objective (United

Nations, 1998). However, the article does not explain whether this two-kind activity has to be implemented at the same time only or whether this should be conducted at the exact location and arrangement. Therefore, further elaboration on this issue is needed.

Then the synergy between CCA and CCM also impacts the ICF. Because synergy can promote more funding for CCA to ensure that CCA and CCM are addressed appropriately, which is vital to vulnerable developing countries (Duguma et al., 2014b). Furthermore, given that CCM activities can benefit or hinder CCA, and vice versa, promoting activities that contribute to both goals can increase the efficiency of the allocation of funds and minimize trade-offs, especially in land-related activities such as agriculture and forestry (Locatelli et al., 2016). All of these advantages can lead to stimulating the implementation of NDC Indonesia. Because with synergies that can minimize trade-offs between the two, CCA can make CCM actions more resilient, thus, promoting more sustainability in both climate actions. Second, from ICF opportunities, promoting CCA funds to balance CCA and CCM can also contribute to the implementation of Indonesia's NDC, considering that the implementation of CCA in Indonesia is experiencing obstacles in terms of funding.

However, synergies have a constraint that can potentially hinder their implementation. Synergies are not equally possible in all sectors because inherent characteristics of the sector and various supportive elements (including technology, finance, social capital, and know-how) that facilitate actions on CCA and CCM are not present nor needed to the same extent in the sectors. For example, some CCM actions in the urban sector will require finance and technology, while others require know-how. Similarly, CCM actions in the forestry sector to support afforestation is about social capital and know-how. In contrast, forest protection generally depends on a combination of finance and social capital (Nordic Council of Ministers, 2017).

Further, CCA options should be designed and implemented while considering the goal of sustainable development. It is to ensure that CCA actions at one scale or sector do not lead to inequitable and unsustainable outcomes or increasing vulnerability in another, such as increased GHG emissions and water use, human encroachment into natural systems, and gender and social inequality increased. Meanwhile, CCM options must be designed well to avoid undermining sustainable development. For example, plantations for bioenergy production, if poorly designed or managed, can encroach on agricultural lands, forests, or indigenous or local ownership. However, if decision-makers stay in a vicious "apple or orange" circle of viewing CCA and CCM differently, they may act without information about comparisons between the two options (Smith, 2002). This approach would have unfavorable implications on national efforts to avoid GHG emissions and adapt to severe potential impacts of climate change (Dang et al., 2003).

Furthermore, the lack of well-documented studies at the regional and sectoral levels hinders the implementation of the synergies between CCA and CCM. Several studies about CCA and CCM only focus on their primary domains, and few studies analyze the secondary consequences (Klein et al., 2007). The literature is also very diverse: there is no consensus as to whether or not exploiting inter-relationships between CCA and CCM is possible, much less desirable. Even some analysts see the potential for creating synergies between CCA and CCM and may produce insufficient CCA and CCM benefits (Venema and Cisse, 2004; Goklany, 2007).

At the same time, others are skeptical about considering CCA and CCM in tandem. There is a risk of the project developer describing the CCM project as a CCA project or vice versa to obtain funds (Klein et al., 2005). Studies in Vietnam and Indonesia have shown that competition for funding resources and limited experience and capacity from related stakeholders contribute to arguments in favor of keeping the two policy approaches on separate tracks (Pham et al., 2014). Furthermore, the integration of CCA and CCM projects can be complex and bring difficulties in coordinating such projects (Dang et al., 2003). It also burdens beneficiary countries and project developers with low technical expertise and awareness if applying and reporting to multiple climate funds (Adaptation Committee, 2020). However, suppose a comprehensive national climate policy could strike a rational balance between CCA and CCM instruments that maximize their potential synergies. Climate policies could become socially and economically efficient and offer more significant opportunities for countries to achieve sustainable development targets despite the large scientific uncertainty (Dang et al., 2003). This is especially important given developing countries' limited financial and human resources.

2.4 Key Takeaways

- The typical concept of the interrelationships between CCA and CCM is synergies and conflicts between the two climate policies or trade-offs in cases where a seek the balance. Understanding this interrelationship is needed to ensure that effective integration maximizes the synergies and minimizes the conflicts between CCA and CCM.

- There is four enabling condition for synergy between CCA and CCM: policy, effective institution, standard, and financial resources. Prioritization of enabling conditions is needed to overcome the inefficiency challenges accompanying the synergies of addressing CCA-CCM issues.

- The synergy between CCA and CCM has advantages for sustainable development and can promote more funding, especially for CCA, for balancing CCA and CCM. While it can contribute to stimulating the implementation of NDC, the lack of international agreement and conceptual and empirical information has created a barrier to reaching the full potential of synergy between CCA and CCM.

- Often type synergy, including M→A, A→M, and A∩M interrelationship, can be massive potential for a funding opportunity, in particular for approved projects under AF or GCF (under ICF) because these proposals have been designed under approval standardized criteria of formally authorized finance institutions under UNFCCC or Paris Agreement.

Chapter three

Methodology

3. Methodology

This study uses primary data from in-depth interviews and secondary data from relevant documents. The in-depth interviews were conducted with several actors that play a strategic role in three cases that we chose in the context of Indonesia. These three cases are several programs or sectors that we believe have high potential in encouraging the implementation of synergies between CCA and CCM, namely:

1) A land-based sector with a particular topic on social forestry, coordinated by the Directorate Of Social Forestry Area Preparation of MoEF (NFP-UNFCCC).
   Social Forestry, according to Government Regulations 23/2021, is a sustainable forest management system implemented in State Forest Areas or private forest/customary forests carried out by local communities or customary law communities as the main actors to improve welfare, environmental balance, and socio-cultural dynamics in the form of Hutan Desa, Hutan Kemasyarakatan, Hutan Tanaman Rakyat, Hutan Adat, dan Kemitraan Kehutanan. Because its activities are related to forest management, we believe that the Social Forestry program has the potential to implement synergies between CCA and CCM.

2) The energy sector, with a potential topic on climate risks to be addressed in electricity generating plants and distribution by PT PLN.
   The energy sector has traditionally focused on CCM. However, climate change can also affect the energy sector, especially in vulnerable countries such as Indonesia. Therefore, the energy sector also needs to consider CCA's efforts to deal with the impacts of climate change that may affect the energy supply. Most recently, AR6 (IPCC, 2022) has also provided scientific support regarding the potential synergies between CCA and CCM in energy systems. Therefore, we try to take the case of energy, especially electricity through PT PLN, to see to what extent the synergy between CCA and CCM has been considered.

3) Local-based climate change actions through the climate village program (PROKLIM), coordinated by the Directorate of Climate Change Adaptation of MoEF (NFP-UNFCCC).
   PROKLIM, according to Regulation of the Director-General of Climate Change Control P.4/PPI/API/PPI.6/3/2021, is a national-wide program managed by the MoEF to increase the involvement of the community and other stakeholders to increase climate resilience, reduce emissions or increase greenhouse gas (GHG) absorption and provide recognition of CCA and CCM efforts that have been carried out can improve welfare at the local level according to regional conditions. Therefore, PROKLIM has much potential to implement the synergy between CCA and CCM.

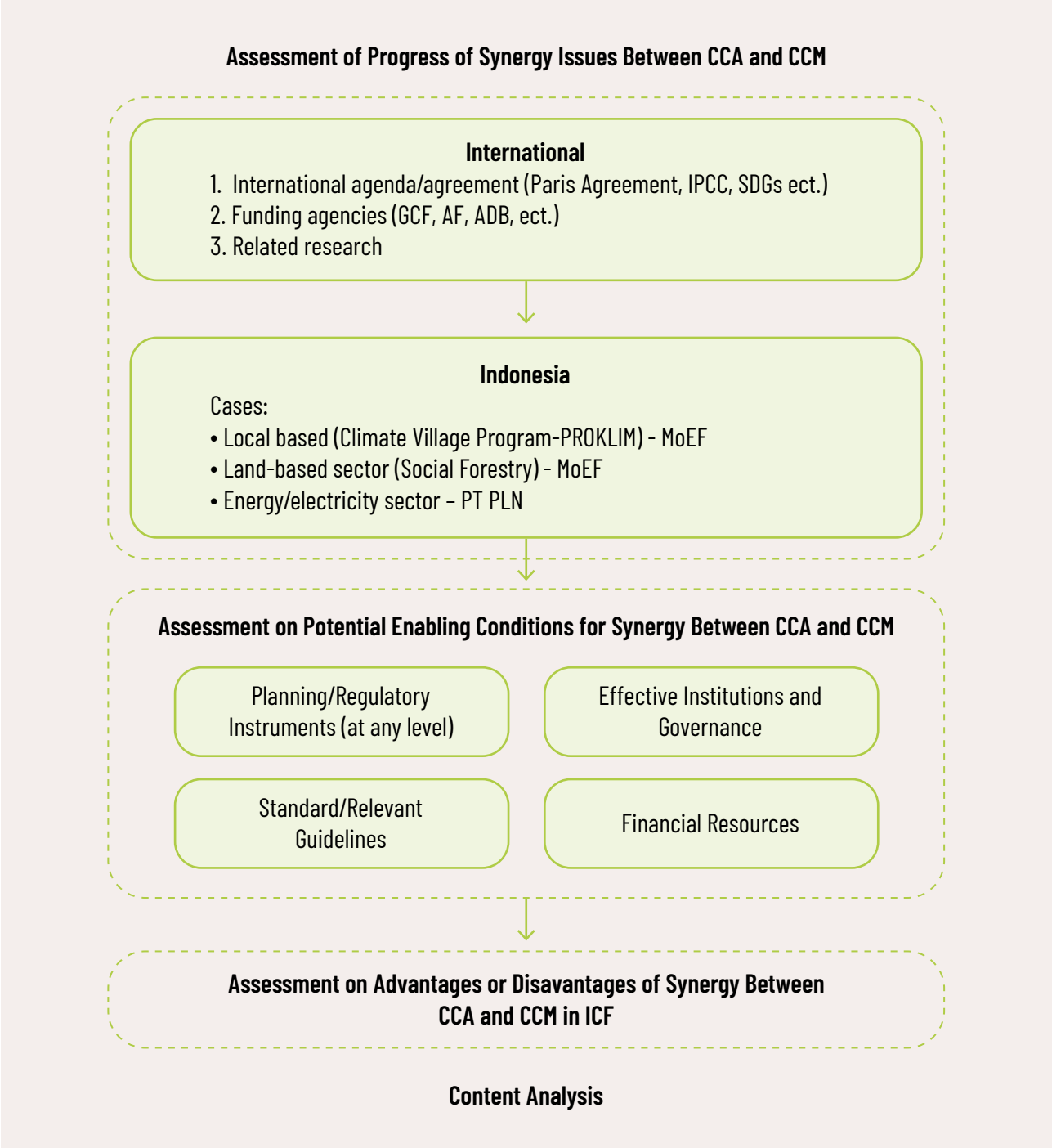
In addition, to obtain in-depth information on updated financial support from ICF, we interviewed leading institutions on this matter in Indonesia, i.e., KEMITRAAN/Partnership for Governance Reforms as of Accredited Entities (AE) for both AF and GCF. Due to the COVID-19 pandemic that limits offline meetings, all primary data collection processes are conducted through online interviews. Table 3 shows the relevant actors from each case we selected as key informants and the discussion themes.

Table 3 List of Interviewees and Their Respective Themes

Position/Institution	Themes
Member of TP2PS/Board Kawal Borneo	Exploring Information Regarding Social Forestry as Part of Programs/Activities to Achieve NDC Targets
Manager of Climate Change PT PLN	To what extent can the Synergy of Climate Change Adaptation and Mitigation be applied to Indonesia's energy sector, especially electricity at PLN?
Director for Climate Change Adaptation, Ministry of Environment and Forestry (MoEF)	The Synergy of Climate Change Adaptation & Mitigation in the Climate Village Program (PROKLIM)
Program Director For Sustainable Governance Strategic Kemitraan (Partnership for Governance Reform)	Funding Opportunities to Promote Synergy of Climate Change Adaptation and Mitigation for Effective NDC Implementation

Furthermore, this research will be analyzed using qualitative analysis methods through qualitative descriptive analysis. Qualitative descriptive analysis is a method for condensing large amounts of data to develop a more coherent understanding or to create a solid basis for analyzing the „how" or „why" of something that happened. (Miles et al., 2014). Therefore Figure 4 shows the research design used in this study.

Figure 4 Diagram of Research Design



Source: Authors' analysis, 2022

The first analysis assesses the progress of synergy issues between CCA and CCM at the international level, referencing Indonesia's climate change governance and policy. While the international context will depend on the literature review results on several relevant documents, the Indonesian context, apart from the literature review results, will also be supported by discussions with key stakeholders or resource persons. Then we scrutinize the documents from each case based on the four enabling conditions for synergy between CCA and CCM. Finally, we will review the benefits of implementing the synergy between CCA and CCM in Indonesia regarding the ICF opportunities, especially for CCA.

Chapter four

Progress of Synergy Issues Between CCA and CCM in International and Indonesia

4. Progress of Synergy Issues Between CCA and CCM in International and Indonesia

4.1 Progress of Synergy Issues Between CCA and CCM at the International Level

Emergent climate change risks have become vital for current and future sustainable development. The cumulative scientific evidence is unequivocal: climate change threatens human well-being and planetary health. Any delay in concerted anticipatory global action on CCA and CCM will miss a brief and rapidly closing window to secure a liveable and sustainable future for all (IPCC, 2022). For this reason, synergy issues are growing from time to time, highlighting the advantages of implementing a synergy between CCA and CCM that will lead to sustainability, which is a pathway to the SDGs (especially in climate action). For this reason, currently, several countries have tried to implement synergies between CCA and CCM in several sectors, some examples of which are shown in Table 4.

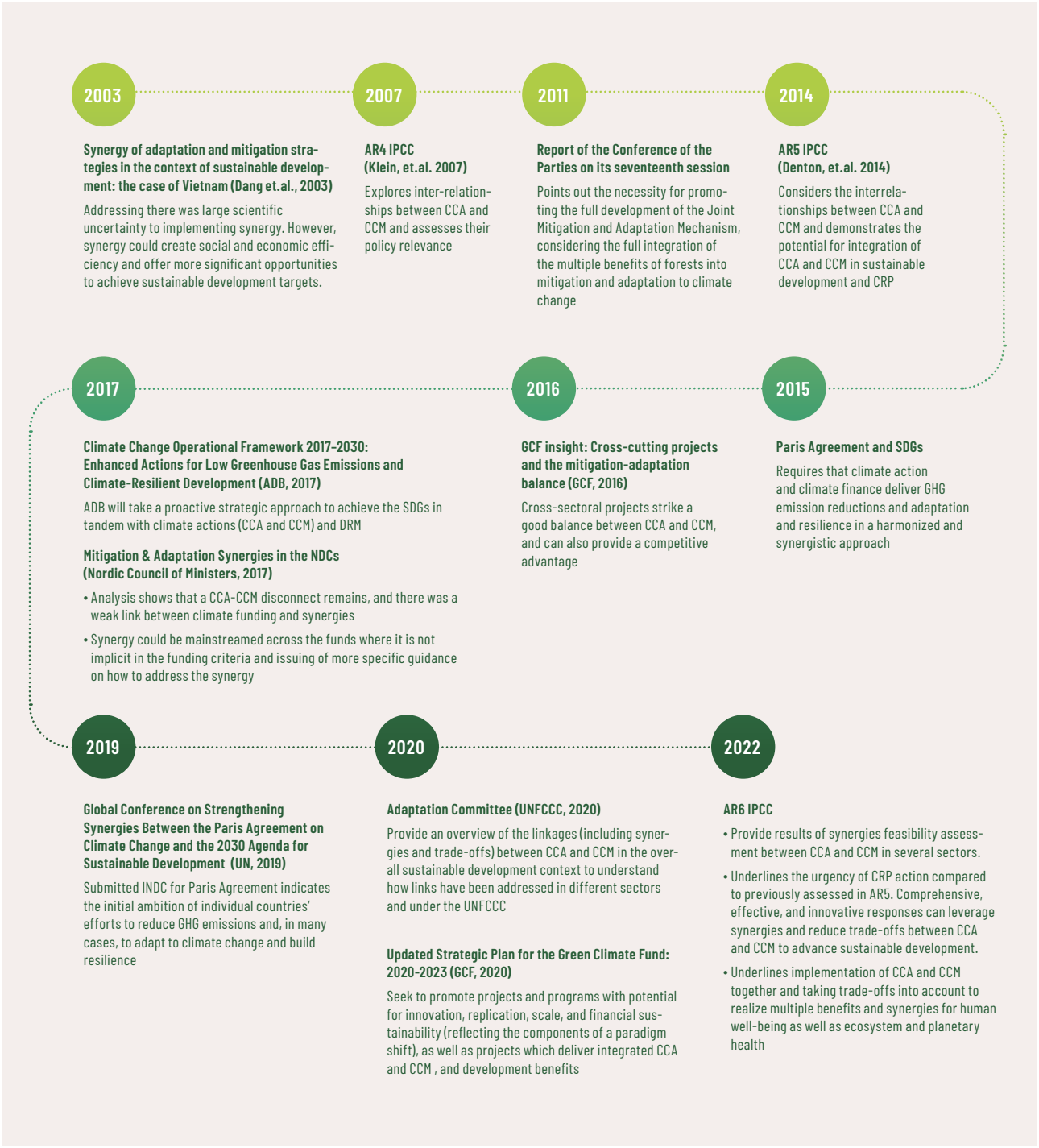
Table 4 Examples of Synergy Implementation in Several Countries

Sector	Cases	CCA Potential	CCM Potential	Source
Agriculture	EPIC (Economics & Policy Innovations for Climate-Smart agriculture), under the FAO's Agricultural and Development Economics Division has initiated a climate-smart agriculture project to increase the capacity of agricultural systems to support food security while incorporating the need for CCA and the potential of CCM into sustainable agricultural development strategies	Enabling/ maximizing production under heavier precipitation conditions	Enhanced carbon sequestration potential of soil	EPIC, 2012
Forestry and land use	REDD + mechanism could have the potential to harness several synergies between CCM and CCA systematically	Increasing adaptive capacity to increasing climate variability and extreme events	Enhanced carbon sequestration potential	Illman, J., M. Halonen, P. Rinne, S. Huq, S. Tveitdal, 2013
Energy	Promoting sustainable charcoal briquettes in Tanzania, which as a renewable raw material, charcoal briquettes are also nearly carbon neutral	Erosion prevention and improved watershed management, reduced vulnerability to increasing energy prices	Reduced emissions from avoidance of fossil fuel-based energy, improved carbon sequestration due to avoided deforestation	Illman, J., M. Halonen, P. Rinne, S. Huq, S. Tveitdal, 2013
Infrastructure construction and planning	The city of Copenhagen suggests synergies from reducing watertight areas in city spatial plans starting in 2009	Reduced vulnerability to sea level rise or flooding	Reduced emissions from the decreased need to pump rainwater and decreased energy consumption	Municipality of Copenhagen, 2009 in Larsen Kornov and Wejs, 2012
Waste treatment	Waste Concern, an NGO in Bangladesh, is implementing a program to manage organic waste from landfills to produce organic compost	Increased moisture retention and fertility reducing vulnerability to drought	Reduced emissions from avoided landfill, increased carbon sequestration	Ayers and Huq, 2008

Source: Modified from Illman et al., 2013

To reach this stage, the issue of synergy has come a long way since it first received attention. Where the synergy issue began was still doubtful due to the lack of further research until many more studies developed synergy issues with other issues, including sustainable development. However, several recent studies also show that the issue of CCA and CCM synergies still faces some challenges and has not developed as expected. Including the development of international climate finance in supporting synergies. Progress on the synergy between CCA and CCM at the international level can be seen in Figure 5.

Figure 5 Progress of Synergy Issues Between CCA and CCM at International Level



Source: Authors' analysis, 2022

Feedback and interrelationships between CCA and CCM, including synergy, have received some attention in recent literature, most notably in work conducted under the IPCC (c.f Klein et al., 2007). However, before that, Dang et al. (2003) tried to analyze the possible contradictions and synergies between the two actions and their implications for developing countries and targets for sustainable development. This study concludes that trying to amalgamate the two options and achieve double benefits from each action to reduce GHG emissions or adapt to climate change is not realistic at the national or global scales because of fundamental distinctions between CCA and CCM from different perspectives. However, despite the large scientific uncertainty, this study also admits that a comprehensive national climate policy could maximize social and economic efficiency synergies and offer more significant opportunities to achieve sustainable development targets.

Based on this study, in the AR4 of IPCC, Klein, et al. (2007) explored the potential synergy between CCA and CCM and identified four types of interrelationship. A true synergy between CCA and CCM is $\int(M, A)$, and the other three are complementary actions, which can have co-benefits ($A \rightarrow M$ and $M \rightarrow A$) or side-effects stemming from actions in other areas ($A \cap M$). Apart from identifying these four types of linkages between CCA and CCM, this study also assesses their policy relevance. Some of the conclusions drawn include:

- Effective climate policies to reduce climate change risks to natural and human systems involve a diverse portfolio of CCA and CCM actions (very high confidence).
- Decisions about CCA and CCM are taken at different government levels, and there is reciprocity within and across these levels (high confidence).
- Creating synergy between CCA and CCM can increase the cost-effectiveness of actions and make them more attractive to stakeholders, including potential funding institutions (medium confidence).
- It is still not possible to answer whether investing in CCA will buy time for CCM (high confidence).
- Community capacity to adapt and mitigate is driven by the same factor (high confidence).

Therefore, although there is a potential synergy between CCA and CCM, there still needs confirmation regarding the synergy's implementation. Because there is a lack of conceptual and empirical information explicitly, the fact that CCA and CCM operate on different spatial, temporal, and institutional scales and involve different actors with different interests, beliefs, value systems, and property rights presents a challenge to implementing synergies. So the concern of Dang et al. (2003) related to the problem of sizeable scientific uncertainty still needs further research.

However, the finding by Klein et al. (2007) in AR4 IPCC encourages further studies related to synergy, which is not only in climate change but is also starting to be linked to sustainable development issues with sustainable development is increasingly threatened by climate change. Therefore, it will be more challenging for many countries, systems, and populations to achieve it unless they pursue resilient development pathways to climate change. In 2011, the Report of the Conference of the Parties, in its seventeenth session (later approved at Rio+20), pointed out the necessity for promoting the full development of the Joint Mitigation and Adaptation (JMA) mechanism, considering the full integration of the multiple benefits of forests into CCA and CCM to climate change.

This occasion also approved the Governing Instrument (GI) for the Green Climate Fund (GCF). Paragraph 2 of the GI defines the purpose of the GCF to provide support to developing countries means to limit

or reduce their greenhouse gas emissions and adapt to the impacts of climate change. While the following paragraph in Paragraph 3 defines that the GCF will strive to maximize the impact of its funding for CCA and CCM and seek a balance between the two. It can be understood from here that although it does not explicitly state the synergy between CCA and CCM, it has shown that the idea of integrating CCA and CCM already exists. It also means that the GCF is starting to open an opportunity for CCA and CCM funding so that it is more likely that synergistic programs or activities in the future will arise.

Further, along with the synergy issues with sustainable development, there were calls for new approaches to sustainable development that consider complex interactions between climate and social and ecological systems. Then was born Climate Resilient Pathways (CRP), a development trajectory combining CCA and CCM to realize sustainable development goals (Denton et al., 2014). The pursuit of CRP involves identifying vulnerabilities to climate change impacts, assessing opportunities for reducing risks, and taking actions consistent with sustainable development goals. These actions may involve a combination of incremental and transformative responses that consider: (1) current and anticipated changes in both average and extreme climates; (2) the dynamic development context that influences social vulnerability, risk perception, conflict resolution, and resilience; and (3) recognition of human agency and capacity to influence the future (IPCC, 2012). The last point is significant, as humans can manage risk and decrease vulnerability through mitigation and adaptation and choices of development goals and strategies.

CRP also includes two overarching attributes: (1) actions to reduce climate change and its impacts, including both CCA and CCM, and (2) actions to ensure that effective risk management institutions, strategies, and identify choices are implemented and sustained as an integrated part of development processes (Edenhofer et al., 2012). Because CCA and CCM can not only contribute to sustainable development but can also hinder it, and vice versa. For example, the intensification of agricultural production systems reduces soil organic matter, which reduces water holding capacity and therefore increases vulnerability to drought. On the other hand, there is competition for land for afforestation or energy crops that could compete with food production.

Therefore comprehensive, effective, and innovative responses that can harness synergies and reduce trade-offs between CCA and CCM are needed to advance sustainable development (IPCC, 2022). Because of that, integrating the two kinds of climate change responses in the broader context of sustainable development has been suggested as an aspirational goal (Wilbanks et al., 2007; Bizikova et al., 2010), especially when policy attention and financial commitments to climate change responses must consider the pursuit of both CCA and CCM.

Several kinds of research suggest that CCA and CCM are likely to be more effective when designed and implemented in other interventions within the broader context of sustainability and resilience (Wilbanks and Kates, 2010; ADB and ADBI, 2012). Wilson and McDaniels (2007) suggest three reasons for integrating across CCA, CCM, and sustainable development: (1) many of the value dimensions that are important to decision making are common to all three decision contexts; (2) the impact of any of the three decision contexts may have significant consequences for the others; and (3) the choice among alternatives in one context can be a means for achieving the underlying values necessary in the others.

Wilbanks and Sathaye (2007) also argue that CCA and CCM pathways might be alternatives in reducing costs, complementary to and reinforcing each other (e.g., improvements in building energy efficiency), or competitive and mutually contradictory (e.g., coastal protection vs. reductions in sea level rise). Nevertheless, to be remembered, trade-offs are also possible, for example, if ecosystem management for CCM purposes reduces the livelihood opportunities and the adaptive capacity of local people (Locatelli et al., 2011). However, the scale of these examples is often local, and the longer-term success of these pathways will depend on the broader context of CCM and the facilitation of CCA options (Metz et al., 2002).

Because studies on the issue of synergy are growing, the JMA and CRP as a potential for synergy are starting to become international concerns. The Paris Agreement and the SDGs in 2015 began to require that climate action and climate finance provide GHG emission reductions and CCA and resilience in a harmonious and synergistic approach. Article 5 of the Paris Agreement encourages policy approaches such as JMA to integrate sustainable management of forests. Furthermore, article 2.1C related to financial flows strongly encourages the CRP concept that seeks to synergize CCA and CCM to enhance climate action implementation and emphasize the importance of CCA. Meanwhile, Sustainable Development Goal 13 (SDG 13) about climate action also considers CCA and CCM action to run together to meet the target.

Following this, the need for CCA and CCM synergy, especially in finance, is increasingly being realized by developing countries and civil society groups, especially in COP22 of UNFCCC in Marrakesh. They expressed concern about the scarcity of CCA finance, to which cross-cutting projects can contribute to solving this problem and deserve close attention (GCF, 2016). Therefore, GCF suggests five potential cross-cutting investment priorities. These priorities are entry points for investment that can impact multiple results areas, targeting both CCA and CCM in an integrated and holistic manner shown in Table 5.

Table 5 GCF Investment Priority Results Area Clusters

Climate Change Action Areas		Investment Priorities				
		Climate-compatible cities	Sustainable low-emissions climate-resilient agriculture	Scaling up finance for forest and climate change	Enhancing resilience in small island developing states (SIDS)	Transforming energy generation and access
CCA						
Increased resilience of	Health, food, and water security		*	*	*	
	Livelihoods of people and communities	*	*		*	*
	Infrastructure and built environment	*	*		*	*
	Ecosystems and ecosystems services		*	*	*	
CCM						
Reduced emissions from	Energy generation and access	*			*	*
	Transport	*				*
	Buildings, cities, industries, and appliances	*				*
	Forest and land use		*	*	*	

Source: Modified from GCF, 2015

As shown in the table above, these five potential investment priorities contribute to each result area. For example, efforts to invest in climate-compatible cities may deliver impacts related to four different results areas. They can reduce transportation emissions, buildings, cities, industries, and appliances. They may also support CCA, particularly by helping to strengthen the resilience of the livelihoods of urban people and communities and urban infrastructure (while also reducing associated emissions). The five investment priorities cluster the eight results areas to achieve cross-cutting benefits in an efficient and impactful way. They largely contribute to CCA and CCM, creating entry points for investment that support the balance across CCA and CCM (GCF, 2015).

Then GCF's survey conducted from 28 November to 10 December 2016 shows how vital cross-cutting projects are. However, there is uncertainty over the CCA-CCM balance due to the lack of transparent and measurable rules for what is considered cross-sectoral projects (GCF, 2016). While most of the Fund's stakeholders believe that their cross-cutting projects strike a good balance between CCA and CCM, they also realize that labeling a project as cross-cutting can give them a competitive advantage. Thus some projects were re-labeled to attract more funds, and cross-cutting projects became more prominent.

However, this raises concerns about how cross-cutting projects indicate the Fund's CCA-CCM balance. Due to the lack of reliable measures to confirm the extent to which cross-sectoral projects contribute to this part of the Fund's mission, creating a danger of stakeholders are proposing cross-cutting projects to appeal to the Board rather than strengthening resilience (GCF, 2016). Therefore, this study concludes that there is a need to clarify the proper balance between CCA and CCM in its funding. The GCF should provide more explicit guidance regarding what projects can be cross-cutting.

Asian Development Bank (ADB) supports synergy between CCA and CCM in line with GCF, with a proactive strategic approach to achieve the SDGs with climate actions (CCA and CCM) and Disaster Risk Management-DRM (ADB, 2017). ADB will ensure the coherence of their policies, strategies, and sector and thematic plans to develop member country climate and development objectives. Given the substantial and long-term efforts to address climate change, many DMCs have expressed the need for support in their strategic planning, policy-making, and investment at the national, subnational, and sector levels.

ADB will also ensure that applicable ADB policies and strategies are reflective and supportive of DMC needs related to CCA and CCM, in line with their overarching development objectives and acknowledging the evolving priorities, capacities, and vulnerabilities of the DMCs (Developing Member Country). ADB sector and thematic operational plans will support climate change CCA, CCM, and DRM, as will the departmental, divisional, and sector and thematic group work plans. However, while there is more support from the funding side to synergize CCA and CCM, a study from the Nordic Council of Ministers in 2017 shows some problems in its implementation.

First, actions across NDCs do not seem to be designed with a specific aim to promote synergies or bridge trade-offs as expected through the Paris Agreement in 2015. Instead, the actions described have one of the two targets in mind, and the latter becomes a side-effect (or co-benefit) to each other (Nordic Council of Ministers, 2017). The Paris Agreement also presents a mixed picture of its link to driving synergies between CCA and CCM. Although it often mentions CCA and CCM side by side, the Paris Agreement and its decision suggest that it can open sup synergy opportunities and does not

prevent them, but at the same time, it does not promote them either. This conclusion is based on an overview of the Paris Agreement articles regarding synergy in Table 6.

Table 6 Overview of Types of CCA and CCM Synergies Found in the Paris Agreement and Decision Texts by Type

Element	Article of Paris Agreement	The decision of UNFCCC COP21	Synergy Type
Purpose	Article 2, para 1c	-	Stipulates that CCA and low emission development should be ensured
NDCs and CCM	Article 4	Ch. III, para 22-40	∫(M,A) as synergy is mentioned in decision para 39, and also, A→M as CCM co-benefits from CCA is mentioned in Paris Agreement 4(7)
CCA	Article 7	Ch. III, para 41-46	M→A, but in the terms that increased M may reduce need for CCA
Finance	Article 9, but no explicit mentioning of CCA and CCM synergies	Ch. III, para 52-64	A couple of examples of ∫(M,A) in policy design and implementation
Technology transfer	Article 10	Ch. III, para 65-70, but no mentioning of CCA and CCM synergies	No classified, as it talks of a balance in support between CCA and CCM
Capacity building	Article 11, but no explicit mentioning of CCA and CCM synergies	Ch. III, para 71-83, but no mentioning of CCA and CCM synergies	No synergy
Global Stocktake (GST)	Article 12	Para 99-101	No synergy
System of Transparency	Article 13, but no explicit mentioning of CCA and CCM synergies	Para 84-98	Action to be reported in elsewise CCM-focused reports:It does not qualify as synergy
Pre2020 action	-	Para 108	M→A, as CCM co-benefits for CCA, is recognized

Source: Nordic Council of Ministers, 2017

The table shows that the Paris Agreement article has not explicitly promoted the urgency of the synergy issue between CCA and CCM. Making the synergy issues has not materialized into specific eligibility or funding criteria for promotion, nor has it been integrated into the funds' application schemes, programmatic framework, monitoring and reporting requirements, or performance frameworks. Therefore, there was a weak link and even a disconnect between CCA and CCM, although integration between CCA and CCM may have occurred in practices (Leonard et al., 2016). Therefore, synergy aspects should be better mainstreamed into the funds, which is not already inherent in today's funding criteria. Suggests that available finance and the international policy framework developed through the Paris Agreement must be inductive to realize the potential synergies. From there, if ICF is made available to promote synergies and if the international policy framework support or even better requires synergistic thinking, it is more likely that national policies would integrate synergistic thinking (Nordic Council of Ministers, 2017).

This finding illustrates the international conditions in understanding the synergy issue between CCA and CCM. Because in 2019, on Global Conference on Strengthening Synergies Between the Paris Agreement on Climate Change and the 2030 Agenda for Sustainable Development by the United Nations stated that submitted (I)NDC (Intended National Determined Contributions) for the Paris Agreement indicates the initial ambition of individual countries' efforts to reduce GHG emissions and, in many cases, to adapt to climate change and build resilience. However, looking back at the study findings by the Nordic Council of Ministers, these statements also do not explicitly state the synergy between CCA and CCM or detail the potential interrelationship mechanisms between CCA and CCM.

With the understanding and urgency still not focused on the potential of the synergy between CCA and CCM, UNFCCC Adaptation Committee in 2020 reissue its scientific support by providing an overview of the linkages (including synergies and trade-offs) between CCA and CCM in the overall sustainable development context to understand how links have been addressed in different sectors and under the UNFCCC. Adaptation Committee points out that CCA and CCM are linked to biodiversity, desertification, food, and agriculture under other international agendas. With great potential to implement mutually beneficial activities that take advantage of synergies between the legal instruments under the UNFCCC and those under CBD (Convention on Biological Diversity), UNCCD (United Nations Convention to Combat Desertification), and FAO (Food and Agriculture Organization). While in the same year, GCF also opened funding opportunities through integration between CCA and CCM in their Updated Strategic Plan for the Green Climate Fund: 2020-2023. These programs will seek to promote projects and programs with potential for innovation, replication, scale, and financial sustainability (reflecting the components of a paradigm shift), as well as projects which deliver integrated CCA, CCM, and development benefits

However, with more substantial scientific and funding support, not all actions in practice have the desired result (Adaptation Committee, 2020). There is still an urgent need to develop effective means and improve current policy instruments and mechanisms. A framework also needs to be developed to integrate the linkages between CCA and CCM measures, considering the positive and negative effects on key sectors and synergies with sustainable development and other legal instruments in the UN process.

Latest, Working Group II's contribution to the Sixth Assessment Report IPCC provides results of synergies feasibility assessment between CCA and CCM in several sectors. It also underlines the

urgency of CRP action compared to previously assessed in AR5 with comprehensive, effective, and innovative responses that can leverage synergies and reduce trade-offs between CCA and CCM to advance sustainable development. Lastly, it underlines the implementation of CCA and CCM and considers trade-offs to realize multiple benefits and synergies for human well-being, ecosystem, and planetary health.

In conclusion, while the current research landscape remains scattered and limited, examples demonstrating the promising potential to accommodate synergies have been identified in several practices. Further, with increasing international attention to the comprehensive impact of climate change and other sectors that may be affected, the synergy issue increasingly developed into various contexts, one of which is sustainable development. However, as reflected in the Nordic Council of Ministers (2017) findings, international policies or agreements do not prevent synergies but do not promote them. Making synergy issues has not necessarily been realized in NDC implementation or not materialize into specific eligibility. For this reason, it is still necessary to mainstream the synergy issue again and develop more detailed policy instruments/mechanisms/ frameworks to implement synergy between CCA and CCM.

4.2 Progress of Synergy Issues Between CCA and CCM in Indonesia

In light of the better implementation of climate change converge at the national level, the Government of Indonesia has made various efforts. One of them is through institutional arrangements through Presidential Regulation No. 16/2015, which stipulates that the leading institution for coordinating climate change governance and implementing the Climate Change Convention at the national level is assigned to the Directorate General of Climate Change (DGCC) of the MoEF as the NFP (National Focal Point) of the UNFCCC. Then, the Directorate of Adaptation and Directorate of Mitigation was formed under the DGCC through MoEF Regulation No. P.18/MENLHK/II/2015 as a follow-up to support the implementation of CCA and CCM actions in Indonesia. This institutional arrangement, on one side, has been appreciated because it has merged power on implementation at the local level. However, on the other side, it has made weaker power on cross-sectoral coordination matters as main task component of the NFP.

Another strategic policy is encouraging and bolstering the Indonesian parliament to ratify the Paris Agreement through Law 16/2016 in order for Indonesia to be able to contribute to the global effort on greenhouse gas emission reduction. Following the first NDC submission in 2015, the Government of Indonesia (GoI) has already submitted Roadmap NDC for CCM in 2019 and CCA in 2020. In 2021, the GoI also submitted the updated NDC to enhance CCA ambitions and clarity on CCM that refers to Katowice Package. Submitted with the Updated NDC, Indonesia's LTS-LCCR 2050 document was also delivered. It presents the carbon-rich nation's sustainable vision beyond the Paris climate targets and strikes a balance between future emission reduction and economic development.

This commitment is reflected in the establishment of Low Carbon Development Indonesia (LCDI). LCDI is a new development platform by MoNDP that aims to maintain economic and social growth through

low GHG development activities and natural resource exploitation. There are three development topics in the LCDI: climate-resilient development, low-carbon development, and circular economy. The first two topics very well reflect CCA and CCM. While climate-resilient development focuses on the marine and coastal, water, agriculture, and health sector, low-carbon development focuses on forestry and peatlands, agriculture, coastal and marine, energy, transportation, and waste management.
On 29 October 2021, Indonesia enacted Presidential Regulation No. 98/2021 on the Carbon Economic Value (NEK). The Regulation developed based on Indonesia's ratification of the Paris Agreement (via Law No. 16 of 2016), under which Indonesia expressed its hope to manage the impact of climate change better and stated its commitment to reducing GHG emissions and achieving NDC. The Regulation prescribes CCA and CCM actions as the two main methods to tackle climate change and achieve the NDC. According to the regulation, implementation of CCA is carried out in food, water, energy, health, ecosystems, and others such as blue carbon. In comparison, CCM is the field of energy, waste, industrial processes, product use, agriculture, forestry, and other sectors such as blue carbon.
The field/sectoral focus shows that NEK regulation and the LCDI contain overlapping sectors. Due to both regulations paying attention and consideration to CCA and CCM, it can be said that synergies opportunities are possible. Unfortunately, while existing policies and regulations have sufficiently facilitated CCA and CCM actions, it has not been explicitly encouraging synergies. The same case also occurs in the SDGs through Presidential Regulation No. 59/2017, primarily Goal 13 (climate action), which encourages strengthening CCA and CCM actions. However, the existing targets have not yet led to encouraging synergistic actions. Therefore existing regulations and policies appear to depict CCA and CCM efforts as separate pathways. In the end, this impact on policy development in several cases examined in this study.

Based on a literature review of several formal documents and discussions related to the PROKLIM, Social Forestry, and energy (electricity), it seems the idea of synergy between CCA and CCM has not materialized as a relevant potential contribution to the implementation of climate change actions including NDC by stakeholders in Indonesia. However, in practice in the field, the activities or activities carried out can potentially take the form of synergies. This can be seen based on the findings in Table 7.

Table 7 Different Forms of Interrelationship Between CCA and CCM in Indonesia

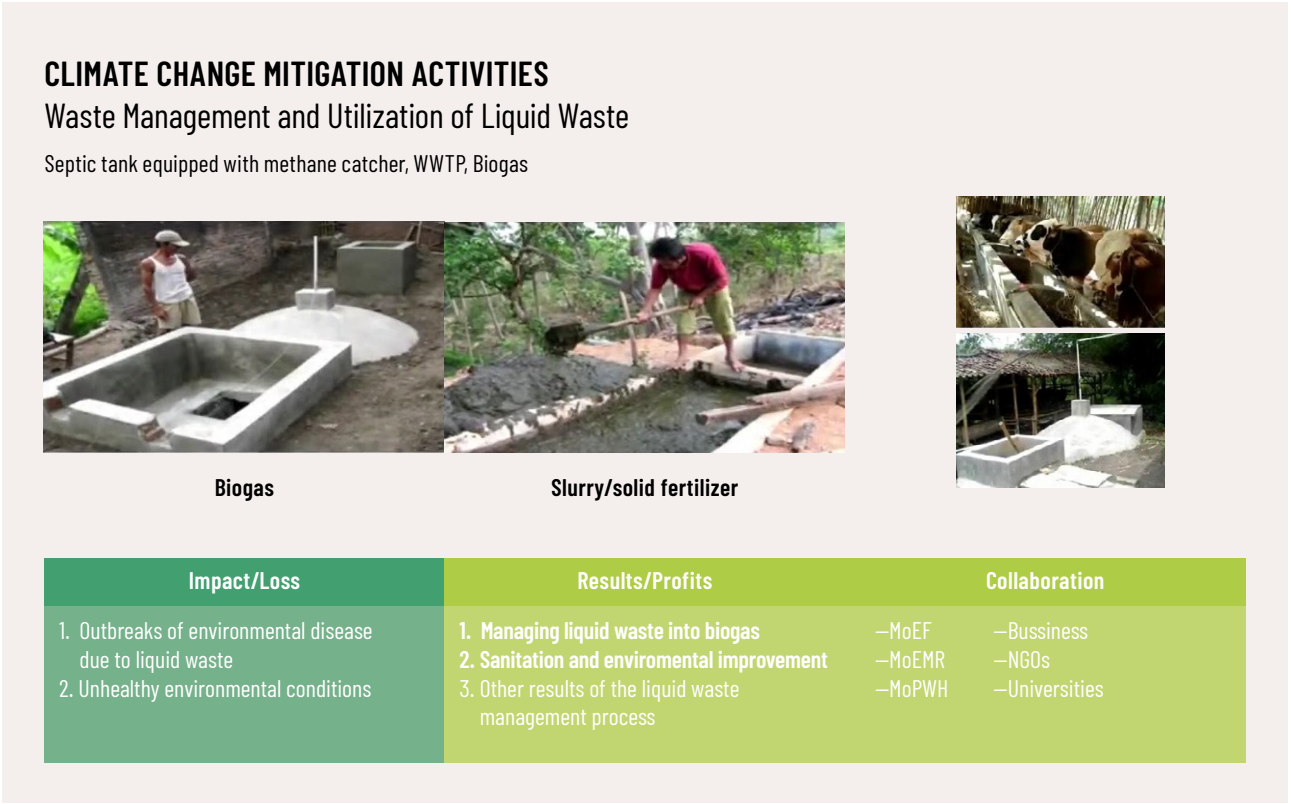
Cases	CCA and CCM Interrelationship
PROKLIM (Climate Village Program) Regulation of the Director-General of Climate Change Control P.4/PPI/API/PPI.6/3/2021 Regarding Guidelines for the Implementation of the Climate Village Program	Mention the Joint Adaptation and Mitigation (JAM) mechanism, which by design, it is not yet a synergy between CCA and CCM. However, several programs and activities can indirectly synergy CCA and CCM, such as waste management, reuse, planting mangroves in the coastal area, etc.
Social Forestry • MoEF Regulation No. 9/2021 on Social Forestry Management • MoEF Regulation No. P.83/MENLHK/SETJEN/KUM.1/10/2016 on Social Forestry	The legal documents do not mention the importance of the synergy concept between CCA and CCM to strengthen the program. However, the synergy between CCA and CCM can be indirectly implemented through forest management activities because land rights entitlements allow the community to manage their environment to adapt to climate change while contributing to CCM through afforestation.
Energy/Electricity • Program Implementation Document: Perusahaan Listrik Negara (State Electricity Corporation) Sustainable and Reliable Energy Access Program— Western and Central Java (ADB, 2021a) • Technical Assistance Report: Republic of Indonesia: Capacity Development in Emerging Technologies, Financed by the Republic of Korea e-Asia and Knowledge Partnership Fund (ADB, 2021b) • Loan Agreement: Sustainable and Reliable Energy Access Program – Western and Central Java. Program Safeguard Systems Assessment (ADB, 2021c)	PLN considers assessing risk reduction and adaptation measures that can be implemented in the future to improve the resilience and efficiency of the grid, which will indirectly contribute to reducing GHG emissions. However, these considerations are not yet incorporated into the current system.

Source: Authors' analysis, 2022

Based on the table, the terms of synergy between CCA and CCM have not been explicitly stated in the policies of each case study. PROKLIM has echoed the Joint Adaptation and Mitigation (JAM) mechanism mentioned in the Regulation of the Director-General of Climate Change Control P.4/PPI/API/PPI.6/3/2021 and updated NDC Indonesia documents in 2021. However, based on interviews and further regulations studies, even though the JAM mechanism can open up synergy opportunities. It has not been designed explicitly regarding the synergy between CCA and CCM. Because the JAM mechanism means that PROKLIM can carry out CCA and CCM actions simultaneously, there is not necessarily a link or interrelationship between them. Such as a program to elevate buildings to anticipate flooding (CCA) with the program for energy-saving lamps (CCM).

Further, the terms of synergy between CCA and CCM are also not explicitly stated in the regulations and guidelines that underlie the program. However, the concept of synergy between CCA and CCM can indirectly be implemented in program implementation and activities. It can be seen from several examples of PROKLIM programs in several regions that the synergy between CCA and CCM can occur indirectly from the activities carried out by PROKLIM, as we can see in Figure 6.

Figure 6 Examples of Waste Management and Utilization Which can be Synergistic Between CCA and CCM



Source: Wijaya, 2022

Besides waste management and utilization of liquid waste, several activities have the potential for synergy between CCA and CCM, such as practices are planting around water springs, limiting water use, etc. (see Appendix I). However, based on data collection from three examples of PROKLIM cases, only a few programs or activities are synergistic.

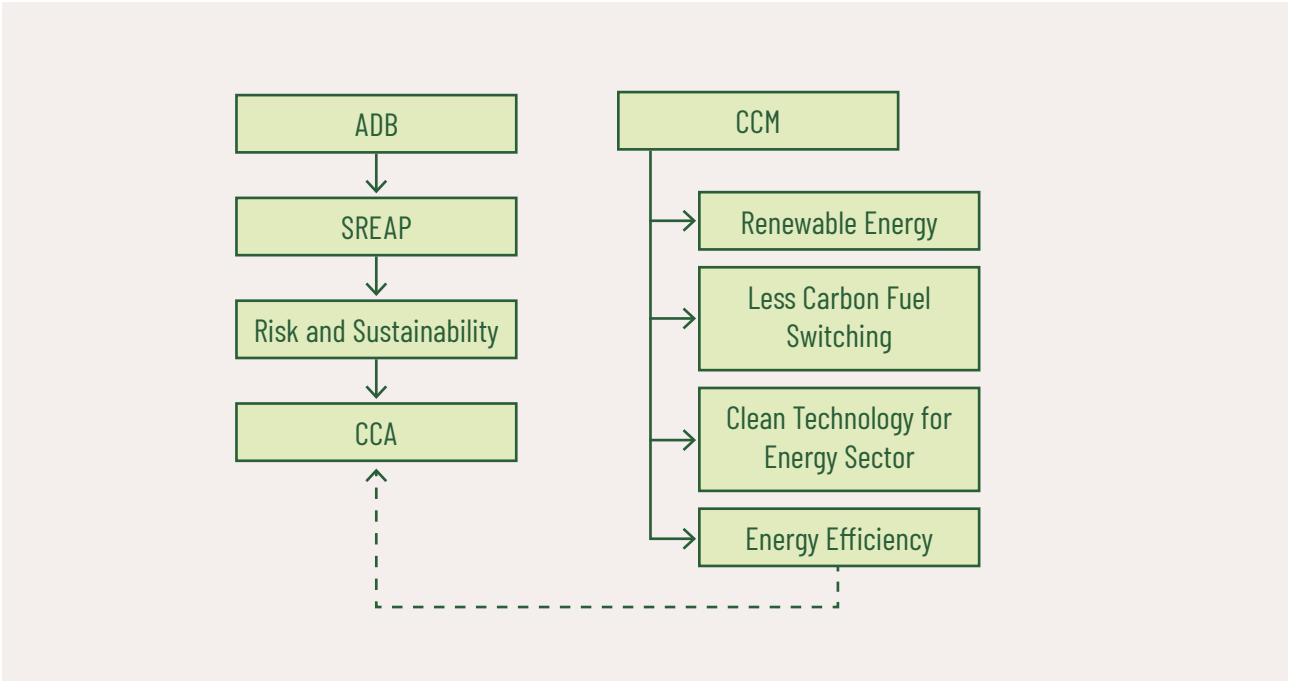
Such practices can also demonstrate in the Social Forestry case, especially in areas that have begun integrating the Social Forestry program with PROKLIM, as exemplified by Nagari Sirukam, Solok Regency, West Sumatra (Komitmen Iklim, 2021a), and Lampo Village, Donggala, Central Sulawesi (Komitmen Iklim, 2021b). Nevertheless, the Social Forestry program should have considerable potential to contribute to climate action and synergy in concept and practice. Indirectly the synergy between CCA and CCM can occur in local communities' forest management activities as land rights entitlements allow the community to manage their environment to adapt to climate change while contributing to CCM through afforestation.

However, even Indonesia's NDC recognizes that Social Forestry is one of the efforts to reduce carbon and strengthen the ecosystem and landscape resilience. Unfortunately, this is not reflected in legal documents regarding Social Forestry, which have not linked the program to the issue of climate change and NDC. Creating synergy issues has also not been mainstreamed, although there is excellent potential in practice.

Meanwhile, in the energy sector, according to several documents from the Asian Development Bank (ADB), PT PLN, through the Sustainable and Reliable Energy Access Program (SREAP)—Western and Central Java has started considering conducting a risk assessment of climate change impacts and measuring CCA. Climate change impacts are starting to be felt on network installations that threaten electricity distribution, with the worst possible case causing a blackout. Therefore, it is necessary to develop sustainable energy access through climate change risk assessment to increase the resilience of the electricity grid infrastructure and increase energy efficiency from supply to distribution to consumers as energy demand increases.

Let us look more closely at the ADB document related to the SREAP. CCA actions more dominate the SREP through risk and sustainability, and even CCM actions have not been considered once in the document. It is estimated that SREAP is a continuation of the SIEP (Sustainable and Inclusive Energy Program) carried out previously. It is also considered that SIEP is more of a CCM action that focuses on renewable energy and energy efficiency, so SREAP seems to fill a gap for CCA actions that have not previously appeared. However, energy efficiency can be an entry point for CCM actions through the energy sector, as shown in Figure 7.

Figure 7 Energy Efficiency as CCM entry into CCA



Source: Authors' analysis, 2022

From the figure above, energy efficiency is one of the CCM efforts in the energy sector and the use of new renewable energy (NRE), clean technology, and the replacement of low-carbon fuels (Fragkos et al., 2021). Therefore, because energy efficiency can undoubtedly contribute to reducing GHG emissions, even though it is not explicitly stated, the actions in the SREAP have included CCM actions. The synergy between CCA and CCM already exists, although not directly.

This energy (electricity) case also teaches how to tackle problems when loan assistance from funding agencies is needed for CCA action. The actions taken can also contribute to CCM (in this case, through increasing efficiency and resilience). Therefore, because there is no mention of CCM actions in the ADB document, it is necessary to claim that this SREAP, which initially only mentioned CCA, can also impact CCM actions. For this reason, as an NFP, MoEF can claim the PLN program to achieve the NDC target.

It can be concluded from several cases in Indonesia that relevant stakeholders in Indonesia are not yet realized the idea or the concept of synergy between CCA and CCM. Including seeing its opportunity or potential to stimulate NDC implementation through its advantages in the context of sustainability and ICF opportunities. Even though there was already great effort through national policies to support CCA and CCM action, existing regulations and policies appear to depict CCA and CCM efforts as separate pathways. It can be seen from several practices from PROKLIM, Social Forestry, and SREAP programs which have contributed to both CCA and CCM. Nevertheless, related policy or legal documents have not written, designed, or mainstreamed the concept of synergy between CCA and CCM specifically and explicitly. Therefore, even though the synergy has taken place in the practice, it is not by design and may simply be understood as a CCA opportunity (as a co-benefits) in a CCM project or vice versa.

Chapter five

Potential Enabling Conditions for Synergy Between CCA and CCM in Indonesia

5. Potential Enabling Conditions for Synergy Between CCA and CCM in Indonesia

The previous analysis shows that stakeholders in Indonesia have not realized the concept or the idea of synergy between CCA and CCM. Creating synergy has not been written, designed, or mainstreamed in the regulations or policies, a similar condition faced at the international level. While conceptually and practically, several programs in this study (PROKLIM, Social Forestry, and Energy/electricity) have great opportunities to realize the issue of synergy. In the absence of policies that underlie the synergy between CCA and CCM in Indonesia, the other components of enabling conditions have not realized the synergy's implementation. The following is the result of analyzing the potential enabling conditions for synergy between CCA and CCM in Indonesia, which explains why the synergy issue has not been implemented optimally, as shown in Table 8.

Table 8 Potential Enabling Conditions for Synergy Between CCA and CCM in Indonesia

Factors	Cases		
	Climate Village Program (PROKLIM)	**Social Forestry**	**Energy/Electricity**
Effective institutions and governance (stakeholders & political leadership)	PROKLIM is managed by the MoEF's Director of Adaptation, while its activities contain CCM elements. There is already a coordination mechanism between the Director of Adaptation and the Director of Mitigation in GHG emissions reduction report from PROKLIM activities through SPECTRUM. However, it still needs further coordination between the Directorates, strengthening the coordination through application synergy in theirs.	The Social Forestry Program is managed by the MoEF's Directorate General of SFEP, and it needs to be coordinated with the MoEF's Directorate General of CCC for activities related to climate change. At the same time, there have been efforts to link climate change issues with Social Forestry through NDC and PROKLIM. Unfortunately, formal policies have not realized this integration effort in real terms.	PT PLN is currently carrying out activities related to climate change in electricity generation, distribution, and transmission. These activities are carried out by the Climate Change Management of PT PLN. However, it still does not link CCA and CCM to each other
Standard/ Relevant Guidelines	Regulation of MoE's Directorate General of energy No. P.4/PPI/API/PPI.0/3/2021 and MoEF Regulation No. 84/2016 stated that the Proklim Action embodies the center on CCA and CCM actions that the community has carried out at the local level. Therefore, implicitly the issue of synergy already exists but is not binding	MoEF Regulation No. 9/2021 on Social Forestry Management and MoEF Regulation P.83/MENLHK/SETJEN/KUM.1/10/2016 on Social Forestry. However, the two regulations have not linked the Social Forestry program to the issue of climate change, both in the context of CCA and CCM	There are no relevant standards or guidelines regarding the synergy between CCA and CCM at PT PLN. However, Handayani (in her Ph.D. dissertation in 2019) shows that CCA in the energy power sector can lead low carbon climate-adapted power system through optimization of electricity supply of low-carbon electricity pathway in terms of CCM through energy efficiency

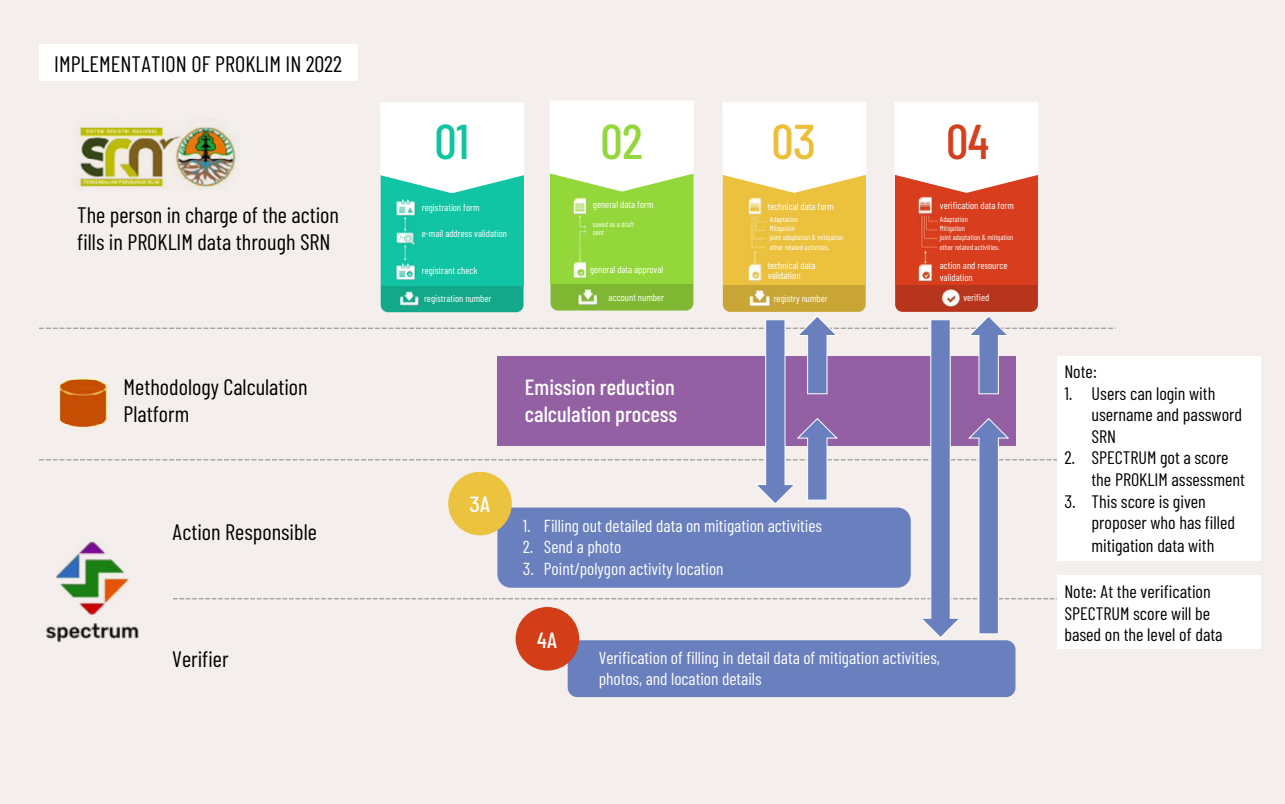
Factors	Cases		
	Climate Village Program (PROKLIM)	**Social Forestry**	**Energy/Electricity**
Financial Resources	Funding sources can be obtained through Bang Pesona, Dana Desa (village fund), Donor, and a bit portion from CSR. However, it is more focused on the environment and social issues rather than on the synergy of CCA and CCM, even though Social Forestry activities have the potential for international climate finance opportunities. At the same time, current policy documents do not include the potential international funding resources to support this program.	PLN has a loan agreement with ADB through SIEP for CCM and SREAP for CCA. However, the two of them have not paid attention to the synergy between CCA and CCM	Have potential funding sources from Village Funds, CSR, and Grants, to local community self-help. However, it is not yet specific to support the issue of CCA and CCM synergy. Even though, in line with the improvement of PROKLIM regulation, massive programs on PROKLIM implementation at the national level have the potential for international climate finance opportunity
Policy/ Planning/ Regulatory Instruments (at any level)	PROKLIM implementation policy has not indirectly supported the issue of CCA and CCM synergy even though there is already potential for implementation.	The Social Forestry program has not been linked to the context of climate change to support the issue of CCA and CCM synergy, even though there is potential for implementation	No policy explicitly raises the issue of CCA and CCM synergy, although conceptually, program implementation can be synergistic

Source: Authors' analysis, 2022

The first case, PROKLIM, is a program under the auspices of MoEF's Director of Climate Change Adaptation. However, based on the implementation in the field, PROKLIM also has programs or activities classified as CCM. It is also written on MoEF Regulation 84/2016 that states the PROKLIM embodies the center on CCA and CCM actions the community has carried out at the local level. The guidelines for implementing PROKLIM have also classified the programs or activities as CCA and CCM actions.

Because of that, PROKLIM programs or activities, both CCA and CCM, should be reported as achieving NDC targets, especially now that the SPECTRUM application has been developed as a measurement tool for calculating GHG emissions reduction from activities carried out by the community through PROKLIM. Later this system will be connected to the National Registry System (SRN) for reporting CCM actions, as shown in Figure 8.

Figure 8 Reduction Emission Reporting Process Through SPECTRUM



Source: MoEF, 2022

As shown by the figure above, through SPECTRUM, communities can report their activities related to CCM actions to calculate the reduction in carbon emissions that can be generated. Communities only need to report the details of the activity carried out then the SPECTRUM system will calculate the contribution of carbon emissions from these activities. These results will be displayed on the SRN website and will be reported for the NDC targets. However, although CCA and CCM are facilitated in PROKLIM, synergy efforts have not received further attention.

The synergy issue is only implicitly mentioned in the contents of the regulatory basis and guidelines from PROKLIM. Because while there is an opportunity for one PROKLIM location to carry out CCA and CCM actions simultaneously (JAM mechanism) which opens up synergy opportunities, the regulations are not very detailed and binding and also not necessarily in the form of synergy. Therefore, although the coordination mechanism between the Director of Adaptation and the Director of Mitigation has already been in the GHG emissions reduction report from PROKLIM activities, it still needs further coordination between the Directorates and strengthening the coordination through implementing existing synergies opportunities.

The non-specificity of the synergy issue between CCA and CCM also results in financial resources. Although PROKLIM has a very diverse potential for funding sources from CSR and grants to local community self-help, the funding scheme has not explicitly supported the synergy issue (for a more detailed review of several PROKLIM case studies, see Appendix II.). Even though, in line with the improvement of PROKLIM regulation, massive programs on PROKLIM implementation at the national

level have potential international climate finance opportunities. One of them is MoEF's Directorate General of Climate Change Control mandate for utilizing the AF to support the expansion of the PROKLIM action to pursue the target of reaching 20,000 locations by 2024 (MoEF, 2022). In general, the PROKLIM implementation policy has not indirectly supported the issue of CCA and CCM synergy, even though PROKLIM has excellent potential for its implementation considering the main purpose.

Similar cases are also found in the case of Social Forestry but are more complex. While PROKLIM is still under the authority of MoEF's Directorate General of Climate Change Control, the Social Forestry program is under a different Directorate, MoEF's Directorate General of Social Forestry and Environmental Partnership (SFEP). Looking at the regulatory basis through MoEF Regulation P.83/MENLHK/SETJEN/KUM.1/10/2016 and the guidelines through MoEF Regulation No. 9/2021, the Social Forestry program has not even been linked to the context of climate change. Whereas in terms of programs and activities, forest management can undoubtedly contribute to climate action, both CCA and CCM. However, it seems there has been an effort from each directorate general to link the Social Forestry program with the issue of climate change through integration with PROKLIM, which is illustrated through the webinar shown in Figure 9.

Figure 9 Webinar Related to the Potential for Integration of PROKLIM with Social Forestry Programs

Source: MoEF, 2022

Unfortunately, formal policies have not realized this integration effort in real terms. In fact, according to the PROKLIM roadmap in 2017, the need for synergy between PROKLIM and Social Forestry has been mentioned to achieve the PROKLIM facilitation target contained in the Strategic Plan (RENSTRA) of the MoEF for 2015-2019. This synergy can be implemented by considering that the main target of the activity is the community, with the main objectives of the program/activity to improve the welfare of the community and to increase the sustainability of forest resources that contribute to the reduction of greenhouse gas emissions and environmental quality.

Therefore, MoEF's Directorate General of CCC as NFP-UNFCCC, in collaboration with the Directorate General of SFEP, needs immediate actions on policy setting and regulation development on these particular issues to provide a legal basis for the inclusion program into the NDC achievement target. It is also necessary to address the inefficiency of resources and funding issues, considering that Social Forestry activities with potential contributions from both CCA and CCM are not being recorded or reported, especially for the NDC target.

While in the financial context, Social Forestry also has problems similar to PROKLIM. Social Forestry activities generally get funding from APBN through Bang Pesona and Dana Desa (village fund), Donor, and a bit portion from CSR. However, it is more focused on the environment and social issues rather than on the synergy of CCA and CCM, even though Social Forestry activities have the potential for international climate finance opportunities. At the same time, current policy documents do not include the potential international funding resources to support this program.

For the case of energy/electricity, PT PLN is currently carrying out activities related to climate change in electricity generation, distribution, and transmission. These activities are carried out by the Climate Change Management of PT PLN. Based on the previous analysis, although the synergy issue was not explicitly mentioned, the synergy may occur indirectly in practice. This condition occurs because relevant standards or guidelines on synergy issues exist. However, Handayani (in her Ph.D. dissertation in 2019) shows that CCA in the energy power sector can lead low carbon climate-adapted power system through optimization of electricity supply of low-carbon electricity pathway in terms of CCM through energy efficiency. Although the study only provides one point of view, based on the interview results with the author, she also does not deny the potential for the other interrelationships that can occur, including the potential for synergies between CCA and CCM.

In terms of financial resources, there are two types of ADB programs that are the case in the energy sector. The first is that ADB conducts policy-based lending as part of the SIEP, which produces formal regulations on renewable energy and energy efficiency, generally in ministerial regulations and, on occasion, in presidential regulations. The ADB implements the SIEP as a primary lender with the GoI through the MoNDP. The implementation period of the SIEP is June 2013–September 2015 for subprogram 1 (finalized), October 2015–September 2017 for subprogram 2 (finalized), and October 2017–September 2019 for subprogram 3 (finalized). SIEP is more of a funding source for energy sector CCM actions.

Then, PT PLN also implements the SREAP to enhance access to sustainable and reliable energy for Western and Central Java populations and finance a slice of the broader program in Electricity Power Supply Business Plan 2021–2030. Unlike SIEP, SREAP is more intended as a CCA action in the energy/electricity sector. Although through these two programs, PLN has begun to show efforts to

incorporate CCA and CCM factors into its business plans. However, the two programs have not linked CCA with CCM. Even though, based on the previous analysis results, energy efficiency can open up opportunities for CCM actions to be included in CCA. Create synergy between the two.

Therefore, based on these results, each program has the potential to apply the synergy concept between synergy between CCA and CCM to stimulate NDC implementation. Because each program already has each enabling condition needed to realize synergy implementation. Nevertheless, unfortunately, the existing instruments have not addressed the synergy issue.

This situation occurs because of the lack of support for national climate policies in mainstreaming the synergy issue between CCA and CCM. Although since ratifying the Paris Agreement through Law 16/2016, the GoI has made various efforts to support climate action, both CCA and CCM to achieve NDC targets. The existing policies have not explicitly mandated and paid special attention to synergy implementation. Even the latest regulation through the NEK regulation prescribes a process similar between CCA and CCM. It does not promote the synergies that may occur. So even though there are already policy and regulatory instruments that support CCA and CCM actions, the synergy issue is still not a concern.

The absence of specific policies that mainstream or design the synergy issue is why existing programs have not been able to fully implement the synergy between CCA and CCM, despite the opportunities and potential. Ultimately, it causes some programs or activities that should have potential synergies and contribute to NDC targets for both CCA and CCM to be not recorded or reported. This leads to inefficient resources, including funding, which hinders NDC implementation.

Chapter six

Advantages of Synergy Between CCA and CCM in ICF

6. Advantages of Synergy Between CCA and CCM in ICF

While several scientific studies support the implementation of CCA and CCM synergies, which conceptually can lead to resilience and sustainability, practically, these synergies can also open up funding opportunities. As Fu, Zheng, and Wang (2014) stated, the synergy between CCA and CCM can lower costs and help balance the dual CCA and CCM goals under limited resources. For example, it is conceivable that a country can apply for a loan or prepare a budget for climate change action. The funding can be used simultaneously through a synergy scheme in its activities and the resulting impact. These advantages can genuinely be helpful, especially to developing countries with limited resources but, at the same time, have to deal with the impacts of climate change. However, looking at the conditions internationally, especially in Indonesia, it has not fully realized the synergy between CCA and CCM and its opportunities. Make there is unharvested potential for strengthening synergies at all levels of the fund's program and describing what was found in a study by the Nordic Council of Ministers (2017), which is still ongoing today.

However, ICF already provides opportunities for the synergy funding scheme, although not explicitly. One of the cases is the GCF by the UNFCCC. GCF is mandated to ensure that its investments drive a paradigm shift toward low emissions and climate resilience, as explained in Paragraphs 2 and Paragraphs 3 of the GCF Governing Instrument (2011). The following describes how it will achieve these goals by supporting developing countries to reduce greenhouse gas emissions (CCM) and adapt to climate change impacts (CCA).

Therefore, GCF has goals and result areas to seek impact within eight CCA and CCM results in areas chosen because of their potential to deliver a substantial impact on CCM (Energy access and power generation; Low emission transport; Buildings, cities, industries, and appliances; Forestry and land use) and CCA (Most vulnerable people and communities; Health and well-being, food and water security; Infrastructure and built environment; Ecosystems and ecosystem services). The GCF is also committed to achieving a balance between its funding for CCA and CCM initiatives and focuses further on five cross-cutting investment priorities as entry points for investment that can have an impact in multiple results areas, targeting both CCA and CCM in an integrated and holistic manner, and with substantial co-benefits (GCF, 2015), among them:

1) Climate-compatible cities;
2) Sustainable low-emission, climate-resilient agriculture;
3) Scaled-up Finance for forests and climate change;
4) Enhanced resilience in SIDS; and
5) Transformed energy generation and access.

This cross-cutting project by GCF shows that the synergy issue between CCA and CCM seems to require an entry point to become a liaison between CCA and CCM. The intended entry points can be in the form of sectors that can cover CCA and CCM actions. For example, are climate-compatible cities case. Cities consume more than 75 % of the world's natural resources and use 60-80% of their energy,

while they are responsible for 75 % of global emissions (GCF, 2015). Therefore, reducing emissions from cities can significantly contribute to global CCM efforts.

Meanwhile, cities are also likely to be highly vulnerable to climate change (e.g., rising sea levels, storm surges, heat stress, extreme precipitation, inland, coastal flooding, landslides, drought, water scarcity, and air pollution), making CCA also a priority. Therefore investing in lower emission and more climate-resilient cities offers immense cross-cutting potential for CCM and increased resilience (CCA). However, there is no explicit reference to promoting synergies between CCA and CCM or that such synergies should be promoted to support (I)NDCs/NDCs.

It can be seen from the Concept Note format used for programs/project proposals, or a Funding Proposal for a whole project may tick off whether proposals are relevant for CCA or CCM or cross-cutting as a third option. In it, applicants are asked to report on which of the GCF's eight Result Areas the project will deliver on and can thus mark all that apply, both CCA and CCM (see appendix III). Applicants should also state expected climate CCA or CCM impact potential and performance against investment criteria and the fund's performance measurement framework for CCA and/or CCM. Sustainable development potential is defined solely as economic, social, and environmental co-benefits. Nevertheless, there is no clear incentive or reporting requirement on the synergy between CCA and CCM. Thus, this is left at the applicant's discretion case-by-case basis.

However, in the Performance Measurement Frameworks (PFM), CCM projects/programs that generate CCA results should report on CCA indicators (and vice versa for CCA projects/programs with CCM results). An illustrative example is mentioned a project that primarily intends to improve land and forest areas contributing to emission reductions (results 9.0 in the mitigation PMF) and, by doing so, also contributes to increasing the resilience of the ecosystem (result 4.0 in the adaptation PMF) would report on the relevant indicators for both CCA and CCM.

Specifically, in the Indonesian context, the NDA (National Designated Authority) and stakeholders have agreed to use the same criteria to decide which priority projects will later be proposed to the GCF by project proponents, with some adjustments made to investment criteria considering the specific situation of Indonesia. Adjusted criteria only to prioritize projects by NDA. AE is still required to meet the GCF criteria in the Concept Note/Funding Proposal following the GCF standards. There are seven agreed criteria: Potential Impact, Potential Paradigm Shift, Potential for Sustainable Development, Needs of Recipients, Country Ownership, Efficiency & Effectiveness, and Project/Program Sustainability, as shown in Table 9.

Table 9 Indonesia's Criteria for Prioritizing Proposed Climate Action to the GCF

Criteria	Value
1. Impact potential For CCM For CCA	…. TonCO_2-eq ….household or population as the beneficiaries of the project or program
2. Paradigm Shift a) Innovation b) Potential for scaling-up and replication c) Potential for knowledge and learning d) Contribution to the creation of an enabling environment e) Contribution to the regulatory framework and policies f) Overall contribution to climate-resilient development pathways	Scale 1 to 10 (at least one indicator should be met)
3. Sustainable Development Potential a) Economic co-benefits b) Social co-benefits c) Environmental co-benefits d) Gender-responsive development impact	Yes or No (at least one indicator should be met)
4. Needs of Recipients a) The vulnerability of the country and beneficiary groups for climate adaptation actions b) The economic and social development level of the country and the affected population	Yes or No (at least one indicator should be met)
5. Country Ownership a) Coherence and alignment with the country's national climate strategy and priorities as well as other existing policies b) Stakeholder engagement process and feedback received from civil society organizations and other relevant stakeholders	Yes or No (at least one indicator should be met)
6. Efficiency and Effectiveness For CCM For CCA	…. US$ per TonCO_2-eq …. US$ per person beneficiary
7. Project/Program Sustainability	Yes or No

Source: FPA, 2021

Based on the criteria above, it can be seen that the synergy scheme between CCA and CCM is possible through the GCF, as seen in the criteria for potential impact and efficiency and effectiveness. In addition, synergy is possible through its linkage with sustainable development as stated in criterion three, where the project must at least be able to provide co-benefits in terms of economic, social, environmental, and gender-responsive development.

Thus, the GCF has designed a funding scheme that supports the implementation of synergies between CCA and CCM. However, shortcomings still exist, such as a lack of specificity. So regarding the issue of synergy between CCA and CCM in Indonesia, this condition raises the question of whether, when the project proponent submits a proposal to the GCF through an Accredited Entity (AE) or National Designated Authority (NDA) in Indonesia, there is or not special promotion or support when considering the concept of synergy. The GCF expects AEs to self-identify and self-categorize their concept note or funding proposal within the CCA or CCM result areas or, for a cross-cutting project, across both CCA and CCM result areas (GCF, 2021).

Because in practice, it seems the idea of synergizing CCA and CCM through GCF is not known by many. According to the project pipeline in June 2020, there was a small number of project ideas (projects developed by the project proponent and consulted to the NDA that considered their project impact for both CCA and CCM, with only three from 34 projects. Where of the three projects, all of them have initial CCM designs, as shown in Table 10.

Table 10 List of Project Ideas That Consider CCA and CCM Impact

Project/ Program Title	CCM or CCA	Component	AE	Project Owner	Project Size (USD)	Estimated CCA or CCM Impact	
						CCA (number of direct beneficiaries)	CCM (tCO_2-eq emissions reduction per year)
Access to Energy in Papua - solar and battery microgrid in remote off-grid villages	CCM	The project aims to provide: 1. Capacity building to regulators to enable private investment and co-op scheme 2. Micro-grid installation capacity building on O&M for co-op members/villagers	To be entered	PT. Listrik/ Electric Vine Industry with ENGIE and ADARO	44,000,000	24,000	8,833
Reducing Emissions Through Strategic Agulture Zone in Gorontalo: Transforming Food Crops, Coconut and Livestock Industries	CCM	The project aims to provide: 1. Increased number of small and medium biogas installations as a low-emission energy generator 2. Strengthened institutions and regulatory systems for low-emission planning and development 3. Established appropriate business practices ensuring land management sustainability	KEMITRAAN	Yayasan Rumah Energy, LTKL, and Gorontalo Government	16,850,726	13,119	6,716
Jambi City Landfill's Methane Capture and Greenhouse Gases Mitigation Project	CCM	The project aims to provide: 1. Information dissemination and education in reducing and sorting waste 2. Methane capture by collecting the landfill gas and building a WtE power plant 3. Plastic waste management throughout Jambi City 4. Waste management at source 5. Greening Talang Gulo Landfill 6. Development of monitoring and evaluation tools	To be entered	Government of Jambi City	TBD	750,000	466,440

Source: FPA, 2020b

It can be seen from the table above that projects with potential synergies were not initially designed as synergy between CCA and CCM. Generally, a project is designed for one purpose (CCA or CCM), which is then put into operation and estimated to impact both. Therefore synergy can only be seen as a CCM activity that has additional benefits for CCA (co-benefits) and vice versa.

Meanwhile, the Adaptation Fund (AF) does not explicitly design mechanisms for synergies between CCA and CCM. Unlike the GCF, which has cross-cutting investment priorities and criteria components for both CCA and CCM that can encourage the implementation of synergies. The criteria for AF are still general and tend only to support CCA activities. However, synergies have worked in several project implementations in practice, although not by design.

One of the cases was in the AF project in Pekalongan City, Central Java. This project uses the Safekeeping-Surviving-Sustaining (3S) approach toward building coastal city resilience. One of the project components is to enhance protection along the coastal line by planting mangroves along 6 kilometers of shoreline (Adaptation Fund, 2021). The project report acknowledges increased coastal community resilience as an expected result. However, the mangrove ecosystem also acts as a carbon capture which can reduce GHG emissions. Therefore this activity can be synergistic because it benefits both CCA and CCM.

A similar case was also found in the Community Adaptation for Forest-Food Based Management in Saddang, South Sulawesi. One of the project components is to strengthen Social Forestry to encourage forest food Upstream of Saddang Watershed with CCA efforts will be carried out through rehabilitating the agroforestry model pattern (Adaptation Fund, 2020). However, the project report acknowledges that this rehabilitation activity is also an effort to reduce greenhouse gas (GHG) emissions.

KEMITRAAN, an AE for AF and GCF in Indonesia, acknowledges that synergy has already existed and occurred. However, even though there is potential and several project cases prove that synergies are possible. The synergy has not occurred by design, even by KEMITRAAN itself. The lack of understanding of the potential synergies between CCA and CCM from project proponents and AE or NDA and related government stakeholders is the main problem why current funding opportunities for synergy between CCA and CCM are failing to be utilized. Resource and time constraints to access these funds also became obstacles to implementing the synergy between CCA and CCM in Indonesia.

Besides that, the monitoring and reporting efforts of the funding institutions are focused on the project's primary objectives, rather than co-benefits related to CCA and CCM, nor the potential synergies that can be analyzed and learned from. The lack of "synergetic climate funding" can also be explained by the differing nature of CCA and CCM measures. Aspiring for both CCA and CCM benefits simultaneously is seen as leading to increasing complexity of initiatives and possibly higher transaction costs. Because as it is known, while the requirement for demonstrating the additionality of CCM funding is relatively straightforward (quantitative metrics through reduction of greenhouse gas emission), there is no such metric for measuring CCA as most adaptation measures are similar. Based on previous reports, there are still no available metrics in Indonesia that have been developed together among stakeholders with agreed scientifically (Suroso et al., 2021).

Therefore, while it is necessary to encourage through policies/regulations, including capacity-building programs for AEs and NDAs, well-defined adaptation metrics are still very much needed, especially for assessing the progress of CCA implementation. The funding could also be made conditional to achieving such synergies, and this may require modifications and innovations to funding approaches, e.g., as up-front funding requirements for synergetic projects may be a barrier (McCarthy, Lipper, Branco, 2011)

However, ICF through GCF and AF already has a great potential for Indonesia context to be utilized for implementing synergy between CCA and CCM, especially for the cost-effectiveness of climate change actions and the NDC implementation. Because as one of the countries vulnerable to climate change risk, Indonesia is making all efforts to tackle climate change impact through both CCA and CCM. For this reason, the issue of balancing funding for CCA and CCM is very much needed amid the dominance of CCM. Therefore, relevant stakeholders should understand the synergies' advantages and then maximize funding opportunities through the implementation of synergies.

Chapter seven

Findings and Way Forward

7. Findings and Way Forward

7.1 Findings

While the research landscape remains scattered and limited, examples demonstrating the promising potential for accommodating synergies have been identified in several practices. However, the synergy issue has not been fully realized to leverage funding sources for CCA and CCM activities at the international and national levels (in Indonesia). Therefore, while many countries, including Indonesia, have acknowledged the potential and existence of synergy (some are packaged into various other forms/terms), there is no strong message in emphasizing the importance of synergy.

Based on a study by the Nordic Council of Ministers in 2017, the Paris Agreement presents a mixed picture of its link to driving synergies between CCA and CCM, creating a weak link. Although it often mentions CCA and CCM side by side, it even possibly opens up opportunities for synergy and does not prevent it, but at the same time, it does not promote them either. Making the synergy issues has not materialized into specific eligibility or funding criteria for promotion, nor has it been integrated into the funds' application schemes, programmatic framework, monitoring and reporting requirements, or performance frameworks. Making some of the existing synergy practices is mostly not by design. This finding still describes the current issues of implementing synergy between CCA and CCM in Indonesia.

Since ratifying the Paris Agreement through Law 16/2016, the GoI has made various efforts to support climate action, both CCA and CCM, to achieve NDC targets. However, the existing national climate policies have not paid special attention and explicitly mandated synergies between CCA and CCM. Later derivative policies have been enacted, i.e., NEK regulation and the LCDI, showing potential synergy opportunities. Unfortunately, it has not been explicitly encouraging synergies either. The same case also occurs in Goal 13 of SDGs (climate action), which encourages the strengthening of CCA and CCM actions but has not yet paid attention to implementing synergies. Therefore, existing national regulations and policies seem to depict CCA and CCM efforts as separate pathways. In the end, even though national policy and regulatory instruments already support CCA and CCM actions, the synergy issue is still not a concern.

Due to the lack of mainstreaming of the issue of synergy between CCA and CCM by national climate policies, based on a study case on Climate Village Program (PROKLIM), Social Forestry, and energy (electricity), relevant stakeholders in Indonesia are not yet aware of the terms or concept of synergy between CCA and CCM, including its potential. It can be seen from these study cases where that concept and practice have the potential for synergy and even have existed. Nevertheless, such a policy has not been written, designed, or mainstreamed the concept of synergy between CCA and CCM expressly and explicitly.

Therefore, the components of enabling conditions also have not realized the synergy's implementation. While each program has the potential to implement a synergy between CCA and CCM, however, the existing instruments have not addressed synergies issues at all. The absence of specific policies that mainstream or design the synergy issue is why existing programs have not been able to fully implement

the synergy between CCA and CCM, despite the opportunities and potential. In the end, some programs or activities that should have potential synergies are not recorded or reported and lead to inefficient resources, including funding, thus potentially hampering the implementation of NDCs.

The case of Social Forestry illustrates the phenomena, even though Social Forestry has an opportunity to implement synergy and contribute to the achievement of NDC. Given that the main objective of this program is to manage forest areas, activities primarily intended to improve land and forest areas contribute to emission reductions and, by doing so, also contribute to increasing the resilience of the ecosystem. This activity has begun to be practiced in the field, especially in areas that have begun integrating it with PROKLIM. However, existing policies, guidelines, and funding sources do not specifically encourage and design the synergy implementation and even link it to the issue of climate change.

Likewise, the case of energy/electricity through the SREAP program provides lessons on how synergies can occur, where it was not originally designed that way. Because of its main objective, SREAP was initially designed as an effort of CCA but then also opened opportunities for CCM action (through energy efficiency). For this reason, as an NFP, MoEF can claim that the PLN program contributes to achieving the NDC target. This case also illustrates if there have been efforts from the GoI to address climate change issues, including synergy issues. However, this issue was never included in the approved regulations or policies. So when the program or activities run, even though synergy between CCA and CCM exists in practice, it is not recorded or reported.

Even PRKOLIM, which has the most significant opportunity to implement synergies because, by design, it encourages CCA and CCM actions, has not explicitly encouraged synergies. Although the regulation has mentioned the JAM mechanism, which opens up opportunities for synergies, this mechanism has not explicitly directed the synergy action. Therefore, even though many activities have the potential to be synergistic, the number is still tiny, and synergy may be understood as a CCA opportunity (as a co-benefits) in a CCM project or vice versa.

The absence of mainstreaming synergy issues in Indonesia through policies or regulations that specifically design the implementation of synergies is unfortunate, considering the benefits that can be obtained. Because while several scientific studies support the synergy between CCA and CCM implementation to achieve resilience and sustainability, the synergy can be massive potential for a funding opportunity. This is particularly true for approved projects under AF or GCF because these proposals have been designed under approved standardized criteria of formally authorized finance institutions under UNFCCC or the Paris Agreement.

Synergy can also encourage climate finance to be more effective and efficient by jointly utilizing these funds for CCA and CCM. All of these advantages can stimulate the implementation of Indonesia's NDC. Because synergies can minimize trade-offs between the two, CCA can make CCM actions more resilient, thus promoting more sustainability in both climate actions and promoting balance funding for CCA and CCM, considering that the implementation of CCA in Indonesia is experiencing obstacles in terms of funding.

However, although funding agencies like GCF already give funding opportunities simultaneously for both CCA and CCM, there is no explicit reference to promoting synergies between CCA and CCM or that

such synergies should be promoted in support of NDCs. There is also no clear incentive or reporting requirement on the synergy between CCA and CCM. Even AF does not provide specific criteria for CCM, although some projects show potential synergies. This condition is also not supported by AE and related NDAs in Indonesia in promoting the issue of synergy between CCA and CCM, while in practice, they admit that the synergies have already existed.

The lack of understanding of the potential synergies between CCA and CCM from project proponents, AE or NDA, and related government stakeholders is why even though the implementation of synergies already exists, it is still minimal. On the other hand, the monitoring and reporting efforts of the funding institutions are focused on the project's primary objectives rather than co-benefits related to CCA and CCM or the potential synergy. The differing nature of CCA and CCM measures also hinders support for synergies, especially since Indonesia lacks well-defined adaptation metrics. Increase the complexity of initiatives and possibly higher transaction costs.

Whereas, as one of the countries vulnerable to climate change risk, Indonesia is making all efforts to tackle climate change impact through both CCA and CCM. For this reason, the issue of balancing funding for CCA and CCM is very much needed amid the dominance of CCM. Therefore, relevant stakeholders should understand the synergies' advantages and then maximize funding opportunities through the implementation of synergies. In the end, it is necessary to innovate in policies, regulations, funding, and climate governance to support the implementation of synergies between CCA and CCM in Indonesia and harness its advantages to stimulate NDC implementation.

7.2 Way Forward

Although scientifically, the synergy between CCA and CCM has great potential, especially towards resilience and sustainability. Based on the case in Indonesia, it turns out that this potential has not been utilized through regulations or policies that, by design, require synergies. The absence of such regulations or policies is alleged since stakeholders in programs or activities do not fully understand the synergy between CCA and CCM. Therefore programs or activities through PROKLIM, Social Forestry, or the energy/electricity sector that have potential and even have occurred that can 'e categorized as synergy are not recorded or reported. This deficiency in climate governance is alleged to have led to Indonesia's ineffectiveness and efficiency in climate change implementation and financing.

However, because the existing programs do not specifically design synergies, these synergistic actions are not reported to contribute to meeting NDC targets for CCA and CCM, even though synergies exist and occur in the field. This may be the cause of the unbalanced funding allocation for climate action in Indonesia (where CCM is more dominant than CCA) and may be caused by several synergistic actions (providing benefits for both CCA and CCM) that are only partially reported as CCA or CCM. Whereas it is also known that Indonesia tends to be more concerned about CCA because Indonesia is one of the countries affected by climate change, there are limited funding sources for CCA. Therefore it needs effectiveness in utilizing the existing climate funding allocations.

For that, the concept of synergy between CCA and CCM needs to be formulated explicitly and materialized in regulations or policies at the national level to stimulate the implementation of NDC and the effectiveness of the climate funding (encourage a more balanced allocation of funding between CCA and CCM). It is also necessary if further research can provide answers to how many/large the potential benefits or advantages of the synergy between CCA and CCM on the efficiency of using ICF funds to stimulate the implementation of NDC both CCA and CCM. Because in the Indonesian context, this information is still lacking to strengthen support for synergy.

In addition, encouraging the promotion and urgency of implementing the synergy between CCA and CCM requires mainstreaming, primarily through international agendas or agreements. One of them is a concern through the Global Stocktake (GST) issue. Indeed, based on the study, GST has not mentioned the synergy issue. However, since GST facilitates global collective progress assessments in three thematic areas, including CCA and CCM (while others are a means of implementation and support), it is undeniable that synergies have the potential to be explored through GST. Therefore, the synergy between CCA and CCM in GST needs to be formulated and materialized, considering GST outputs will consist of key political messages and recommendations, best practices, new opportunities, and lessons learned for all thematic areas. So that the problem of the lack of best practice that supports the potential and advantages of synergies between CCA and CCM, especially in balancing CCA and CCM funding in ICF, can be resolved. Therefore, regarding responding to the UNFCCC agenda on the first GST in 2023, Indonesia needs to prepare a comprehensive framework of its position on GST adaptation that considers the synergy between CCA and CCM—continuing the urgency of the synergy issue at the international level.

Mainstreaming is also required at the national level. As found from the analysis, although national climate policies have facilitated CCA and CCM actions, existing policies have not explicitly promoted the synergy issue. Therefore a needed very shortly to make all related stakeholders work in collaboration with each other, not working in a silo, to provide a way that stimulates the implementation of NDC effectively and efficiently. Therefore, to bring forward CCA and the synergy issues in Indonesia, all related and authorized ministries and institutions to work together and prepare plans and policy strategies under the presidential instruction. Otherwise, the "silo" working style will remain the forever "theme."

In line with efforts to mainstream the synergy issues between CCA and CCM at the national level or even at the international level, besides regulatory and policy support, it also requires capacity building from stakeholders in Indonesia. Besides finance, capacity building is also vital as a means of implementation for the NDC. Capacity building is needed to formulate policies, integrate CCA and CCM into sectoral planning processes, access finance, and provide the necessary information to clarify transparency and understand NDCs (UNFCCC, 2021). Therefore, the importance of capacity building continues to be emphasized to support institutional strengthening in parties' new and updated NDCs.

For these reasons, in the case of Indonesia, capacity building is needed for relevant ministries and institutions, local governments, NGOs, AEs, NDAs, and community groups related to understanding the synergy between CCA and CCM and utilizing the current enabling conditions to realize synergy and harness its advantages. Because in the field, the community seems not to realize the potential of synergy thus, their activities or programs cannot take advantage of the funding schemes offered by the GCF. This condition is also not supported by stakeholders from above, such as the national

or regional government, which does not record or report activities or programs that have potential synergies—even NDA or AE that does not socialize synergy opportunities through ICF to project proponents. Therefore top-down and bottom-up approaches are needed to mainstream the issue to realize synergy between CCA and CCM implementation and utilize its advantages in sustainability and ICF opportunities to stimulate NDC implementation.

Chapter eight

References

8. References

Adaptation Fund (2020) Community Adaptation for Forest-Food Based Management in Saddang Watershed Ecosystem. Project Inception Report.

Adaptation Fund (2021) Safekeeping-Surviving-Sustaining towards Resilience: 3S Approach to Build Coastal City Resilience to Climate Change Impacts and Natural Disasters in Pekalongan City Central Java Province. Project Inception Report.

ADB and ADBI, (2012) Low-Carbon Green Growth in Asia: Policies and Practices. Joint study of the Asian Development Bank (ADB) and the Asian Development Bank Institute (ADBI), ADB, Manila, Philippines, 246 pp

ADB (2017) Climate Change Operational Framework 2017–2030: Enhanced Actions for Low Greenhouse Gas Emissions and Climate-Resilient Development, ADB, Manila, Philippines

ADB (2021a) Program Implementation Document: Perusahaan Listrik Negara (State Electricity Corporation) Sustainable and Reliable Energy Access Program— Western and Central Java (Guaranteed by the Republic of Indonesia).

ADB (2021b) Technical Assistance Report: Republic of Indonesia: Capacity Development in Emerging Technologies, Financed by the Republic of Korea e-Asia and Knowledge Partnership Fund

ADB (2021c) Loan Agreement: Sustainable and Reliable Energy Access Program – Western and Central Java. Program Safeguard Systems Assessment

Adger, W.N. (2001) Scale of governance and environmental justice for adaptation and mitigation of climate change. Journal of International Development 13: 921-931

AfDB, ADB, DFID, DGIS, EC, BMZ, OECD, UNDP, UNEP, World Bank (2002) Poverty and Climate Change. Reducing the vulnerability of the poor. A contribution to the eighth conference of the Parties to the United Nations Framework

Aguilera E., Lassaletta L., Gattinger A., Benjamín S. Gimeno, (2013) Managing soil carbon for climate change mitigation and adaptation in Mediterranean cropping systems: A meta-analysis. Agriculture, Ecosystems & Environment, Volume 168, 2013, Pages 25-36, ISSN 0167-8809, https://doi.org/10.1016/j.agee.2013.02.003.

Ayers, J., Huq, S., (2009) The value of linking mitigation and adaptation: a case study of Bangladesh. Environ. Manag. 43 (5) 753–764, http://dx.doi.org/10.1007/s00267-008-9223-2.

Balaban, O., and de Oliveira, J. A. (2013) Understanding the links between urban regeneration and climate-friendly urban development: Lessons from two case studies in Japan. Local Environment 19(8), 868–890.

Berry PM, Brown S, Chen M, Kontogianni A, Rowlands O, Simpson G, Skourtos M (2014) Cross-sectoral interactions of adaptation and mitigation measures. Clim Chang 128:381–393. https://doi.org/10.1007/s10584-014-1214-0

Bizikova, L., S. Burch, S. Cohen, and J. Robinson, (2010) Linking sustainable development with climate change adaptation and mitigation. In: Climate Change, Ethics and Human Security [O'Brien, K.,A. St. Clair, and B. Kristoffersen (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 157-179.

Bryan BA, King D, Wang E (2010) Potential of woody biomass production for motivating widespread natural resource management under climate change. Land Use Policy 27:713–725. https://doi.org/10.1016/j.landusepol.2009.09.012

Buchner, B., Falconer, A., Herve´ -Mignucci, M., Trabacchi, C., (2012) The Landscape of Climate Finance 2012. Climate Policy Initiatives. https://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2012/

Burch, S. (2010) Transforming barriers into enablers of action on climate change: Insights from three municipal case studies in British Columbia, Canada. Global Environmental Change 20(2), 287–297.

Burton, I. (2000) Adaptation to climate change and variability in the context of sustainable development. In: Gomez-Etcheverri, L. (ed.) "Climate Change and Development", Yale School of Forestry and Environmental Studies, 153-173Bustamante M, Robledo-Abad C, Harper R, Mbow C, Ravindrana N, Sperling F, Haber H, De Siqueira Pinto A and Smith, P. (2014) Co-benefits, trade-offs, barriers and policies for greenhouse gas mitigation in the agriculture, forestry and other land use (AFOLU) sector. Global Change Biology 20(10):3270-90

Burton, I., Huq. S., Lim, B., Pilifosova, O., Shipper, E.L. (2002) From impacts assessment to adaptation

priorities: the shaping of adaptation policy. Climate Policy 2: 145-159

Burton, I., Huq. S., Lim, B., Pilifosova, O., Shipper, E.L. (2002) From impacts assessment to adaptation priorities: the shaping of adaptation policy. Climate Policy 2: 145-159

Chastin, S., Jennings, N., Toney, J., Anadon, D. L., Smith, P. (2021) Co-benefits of climate change mitigation

Dang, H.H., Michaelowa, A., Tuan, D.D., (2003) Synergy of mitigation and adaptation strategies in the context of sustainable development: the case of Vietnam. Clim. Policy 3 (Suppl. 1) S81–S96, http://dx.doi.org/10.1016/ j.clipol.2003.10.006.

Denton, F., T.J. Wilbanks, A.C. Abeysinghe, I. Burton, Q. Gao, M.C. Lemos, T. Masui, K.L. O'Brien, and K. Warner, (2014). Climate-resilient pathways: adaptation, mitigation, and sustainable development. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1101-1131.

De Boer, J., J.A.Wardekker, and J.P. van der Sluijs (2010) Frame-based guide to situated decision-making on climate change. Global Environmental Change: Human and Policy Dimensions, 20(3), 502-510.

de la Torre A, Fajnzylber P, Nash JD (2009) Low carbon, high growth: Latin American responses to climate change-an overview(English). World Bank Latin American and Caribbean studies. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/713951468045039226/Low-carbon-high-growth-Latin-American-responses-to-climate-change-an-overview

Di Gregorio M, Fatorelli L, Pramova E, May P, Locatelli B, Brockhaus M (2016) Integrating mitigation and adaptation in climate and land use policies in Brazil: a policy document analysis, Centre for Climate Change Economics and Policy, Working Paper No. 257, 1–54

Duguma LA, Minang PA, Van Noordwijk M (2014a) Climate change mitigation and adaptation in the land use sector: from complementarity to synergy. Environ Manag 54:420–432. https://doi.org/10.1007/s00267-014-0331-x

Duguma LA, Wambugu SW, Minang PA, van Noordwijk M (2014b) A systematic analysis of enabling conditions for synergy between climate change mitigation and adaptation measures in developing countries. Environ Sci Pol 42:138–148, ISSN 1462-9011. https://doi.org/10.1016/j.envsci.2014.06.003

Dymén, C., and Langlais, R. (2013). Adapting to climate change in Swedish planning practice. Journal of Planning Education and Research, 33(1),108–119.

Edenhofer, O., J.Wallacher, H. Lotze-Campen, M. Reder, B. Knopf, and J. Müller, (2012) Climate Change, Justice and Sustainability: Linking Climate and Development Policy. Springer, Dordrecht, Netherlands, 401 pp.

EPIC (2012), Climate Smart Agriculture: Capturing the synergies among mitigation, adaptation and food security in Malawi, Vietnam and Zambia, Project Brief, available online at: http://www.fao.org/climatechange/epic/en/

Falloon, P. and R. Betts, (2010) Climate impacts on European agriculture and water management in the context of adaptation and mitigation – the importance of an integrated approach. Science of the Total Environment, 408(23), 5667-5687.

Felgenhauer, T., and M. Webster (2013) Multiple Adaptation Types with Mitigation: A Framework for Policy Analysis. Global Environmental Change 23 (6): 1556–1565. doi:10.1016/j.gloenvcha.2013.09.018.

Fragkos P., dkk. (2021) Energy system transitions and low-carbon pathways in Australia, Brazil, Canada, China, EU-28, India, Indonesia, Japan, Republic of Korea, Russia and the United States. Energy, 216, 119385. https://doi.org/10.1016/j.energy.2020.119385.

Ford, J. D., Berrang-Ford, L., and Paterson, J. (2011) A systematic review of observed climate change adaptation in developed nations: A letter. Climatic Change 106 (2), 327–336.

FPIA (Fiscal Policy Agency) (2020a) Laporan Anggaran Mitigasi dan Adaptasi Perubahan Iklim Climate Change Mitigation and Adaptation Budget Report). Jakarta: FPA.

FPA (Fiscal Policy Agency) (2020b) Indonesia Country Programme for the Green Climate Fund. Jakarta: FPA.

FPA (Fiscal Policy Agency). (2021) Indonesia's GCF Country Programme Document. Jakarta: FPA.

Fu, C., Y. Zheng, and W. Wang. (2014) Research Perspectives on Synergic Relationships in Addressing Climate Change Measures. Resources Science 36 (7): 535–1542.

Goklany, I.M., (2005) A climate policy for the short and medium term: stabilization or adaptation? Energ. Environ., 16, 667-680.

Goklany, I.M., (2007) Integrated strategies to reduce vulnerability and advance adaptation, mitigation, and sustainable development. Mitigation and Adaptation Strategies for Global Change, 12, 755-786.

Grafakos, S., Pacteau, C., Delgado, M., Landauer, M., Lucon, O., and Driscoll, P. (2018) Integrating mitigation and adaptation: Opportunities and challenges. In Rosenzweig, C., W. Solecki, P. Romero-Lankao, S. Mehrotra, S. Dhakal, and S. Ali Ibrahim (eds.), Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network. Cambridge University Press. New York. 101–138

Grafakos S, Trigg K, Landauer M, Chelleri L and Dhakal S (2019) Analytical framework to evaluate the level of integration of climate adaptation and mitigation in cities Clim. Change 154 87–106

Green Climate Fund (2011) Governing Instrument for the Green Climate Fund.

Green Climate Fund (2015) Investment Opportunities for the Green Climate Fund. Elements Issues 02. Korea: Green Climate Fund.

Green Climate Fund (2016) GCF insight: Cross-cutting projects and the mitigation-adaptation balance.

Green Climate Fund (2020) Updated Strategic Plan for the Green Climate Fund: 2020-2023.

Green Climate Fund (2021) Independent Evaluation of the Adaptation Portfolio and Approach of the International Fund.

Hamin, E.M. and N. Gurran, (2009) Urban form and climate change: balancing adaptation and mitigation in the US and Australia. Habitat International, 33, 238-245.

Handayani, Kamia. (2019). Electricity and Climate Change: Seeking for the triple nexus of electrification, climate change mitigation, and climate change adaptation. 10.3990/1.9789036548908.

Heidrich O, Dawson R, Reckien D, Walsh C (2013) Assessment of the climate preparedness of 30 urban areas in the UK. Clim Chang 120:771–784

Huq, S. (2002) The Bonn-Marrakech agreements on funding Climate Policy 2: 243-246

Illman, J., M. Halonen, P. Rinne, S. Huq, S. Tveitdal (2013). Scoping study on financing adaptation-mitigation synergy activities. Nordic Council of Ministers, Nordic working papers. (Available from http://dx.doi.org/10.6027/NA2013-902).

IPCC, (2001a) Climate Change 2001: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change, J.J. McCarthy, O.F. Canziani, N.A.

IPCC, (2001b) Climate Change 2001: Mitigation. Contribution of Working Group III to the Third Assessment Report of the Intergovernmental Panel on Climate Change, B. Metz, O. Davidson, R. Swart and J. Pan, Eds., Cambridge University Press, Cambridge, 760 pp.

IPCC (2001c) Climate change 2001: Synthesis Report. WMO, UNEP

IPCC, (2007) Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, B. Metz, O. Davidson, P. Bosch, R. Dave and L. Meyer, Eds., Cambridge University Press, Cambridge, UK. Leary, D.J. Dokken and K.S. White, Eds., Cambridge University Press., Cambridge, 1032 pp.

IPCC (2014) Annex II: Glossary. Mach, K.J., S. Planton and C. von Stechow (eds.). In: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.). IPCC, Geneva, Switzerland. (Available from https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_Glossary.pdf).

IPCC (2015) Adaptation and mitigation. (Available from http://ar5-syr.ipcc.ch/topic_adaptation.php).

IPCC (2022) Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva, Switzerland. (Available from https://www.ipcc.ch/report/ar6/wg2/)

Johnson, K., and Breil, M. (2012). Conceptualizing urban adaptation to climate change-findings from an applied adaptation assessment framework. (Available form http://eucities-adapt.eu/cms/assets/Uploads/UserFiles/32/Johnson%20and%20Breil%202012_38.pdf)

Jones, R. N., P. Dettmann, G. Park, M. Rogers, and T. White (2007) The Relationship Between Adaptation and Mitigation in Managing Climate Change Risks: A Regional Response from North Central Victoria, Australia." Mitigation and Adaptation Strategies for Global Change 12 (5): 685–712.

Jordan, F. (2009) Urban Responses to Climate Change. Regional Development Dialogue 30 (2): 60–75.

Juhola, S., P. Driscoll, J. Mendler de Suarez, and P. Suarez. (2013) Social Strategy Games in Communicating Trade-Offs between Mitigation and Adaptation in Cities. Urban Climate 4: 102–116.

Kane, S., Shogren, J.F., (2000) Linking adaptation and mitigation in climate change policy. Clim. Change 45 (1) 75–102, http://dx.doi.org/10.1023/a:1005688900676.

Kassam A, Friedrich T, Derpsch R, Lahmar R, Mrabet R, Basch G, González-Sánchez EJ, Serraj R (2012) Conservation agriculture in the dry Mediterranean climate. Field Crop Res 132:7–17. https://doi.org/10.1016/j.fcr.2012.02.023

Kates, R.W (2000) Cautionary tales: adaptation and the global poor. Climatic Change 45: 5-17

Klein Richard J.T., Schipper Lisa E., Dessai Suraje (2003), Integrating mitigation and adaptation into climate and development policy: three research questions, Tyndall Centre Working Paper No. 40.

Klein, R.J.T., Schipper, E.L.F., Dessai, S., (2005) Integrating mitigation and adaptation into climate and development policy: three research questions. Environ. Sci. Policy 8 (6) 579–588, http://dx.doi.org/10.1016/j.envsci.2005.06.010.

Klein, R.J.T., Huq, S., Denton, F., Downing, T.E., Richels, R.G., Robinson, J.B., Toth, F.L., (2007) In: Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J., Hanson, C.E. (Eds.), Inter-relationships Between Mitigation and Adaptation. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, UK, pp. 745–777.

Komitmen Iklim (2021a) Sinergi Perhutanan Sosial dan Proklim di Tingkat Tapak: Nagari Sirukam. Avalaible at https://komitmeniklim.id/sinergi-perhutanan-sosial-dan-proklim-di-tingkat-tapak-nagari-sirukam/. accessed on 29 July 2022

Komitmen Iklim (2021b) Sinergi Perhutanan Sosial dan Proklim di Tingkat Tapak: Desa Lampo. Avalaible at https://komitmeniklim.id/sinergi-perhutanan-sosial-dan-proklim-di-tingkat-tapak-desa-lampo/. accessed on 29 July 2022

Landauer M, Juhola S, Söderholm M (2015) Interrelationships between adaptation and mitigation: a systematic literature review. Clim Chang 131:505–517. https://doi.org/10.1007/s10584-015-1395-1

Landauer, M., Juhola, S., Klein, J., (2019) The role of scale in integrating climate change adaptation and mitigation in cities. J. Environ. Plan. Manag. 62 (5), 741–765.

Larsen Sanne Vammen, Kørnøv Lone, Wejs Anja (2012), Mind the gap in SEA: An institutional perspective on why assessment of synergies amongst climate change mitigation, adaptation and other policy areas are missing, Environmental Impact Assessment Review, Volume 33, Issue 1,

Leonard S, Locatelli B, Murdiyarso D, Martius C, Quina M, Baral H, (2016) A match made in Paris: adaptation-mitigation synergies in the land sector. https://doi.org/10.17528/cifor/006106

Lesueur, A., Rosenzweig, C., Pacteau, C., Dépoues, V., Abbadie, L., Bordier, C., and Ali Ibrahim, S. (2015). Scientific brief on the implications of local and regional jurisdictions for mitigation and adaptation to climate change. LPAA Focus on Cities & Regions Climate Action. http://uccrn.org/files/2016/01/COP21-LPAA_UCCRN_I4CE.pdf

Locatelli, B., Evans, V., Wardell, A., Andrade, A. and Vignola, R. (2011) Forests and climate change in Latin America: linking adaptation and mitigation. Forests 2: 431-450.

Locatelli B, Catterall CP, Imbach P, Kumar C, Lasco R, Marín-Spiotta E, Mercer B, Powers JS, Schwartz N, Uriarte M (2015) Tropical reforestation and climate change: beyond carbon. Restor Ecol 23:337–343. https://doi.org/10.1111/rec.12209

Locatelli, B., Fedele, G., Fayolle, V., & Baglee, A. (2016). Synergies between adaptation and mitigation in climate change finance. International Journal of Climate Change Strategies and Management.

Mata Luis J. and Budhooram June (2007), Complementarity between mitigation and adaptation: the water sector, Mitigation and Adaptation Strategies for Global Change 12 (2007):799-807.

McCarthy Nancy, Lipper Leslie, Branca Giacomo (2011), Climate-Smart Agriculture: Smallholder Adoption and Implications for Climate Change Adaptation and Mitigation, Food and Agriculture Organization of the United Nations (FAO), December 2011.

McEvoy D, Lindley S, Handley J (2006) Adaptation and mitigation in urban areas: synergies and conflicts. Proc ICE-Munic Eng 159:185–192

Metz, B., M. Berk, M. den Elzen, B. de Vries and D. van Vuuren, (2002) Towards an equitable global climate change regime: compatibility with Article 2 of the Climate Change Convention and the link with sustainable development. Clim. Policy, 2, 211-230.

Michaelowa, Axel, (2001). „Mitigation versus adaptation: The political economy of competition between climate policy strategies and the consequences for developing countries," HWWA Discussion Papers 153, Hamburg Institute of International Economics (HWWA)

Ministry of Environment and Forestry (2016) Regulation No. P.83/MENLHK/SETJEN/KUM.1/10/2016 on Social Forestry

Ministry of Environment and Forestry (2019) Roadmap Nationally Determined Contribution (NDC) Mitigasi Perubahan Iklim. Jakarta (ID): Ministry of Environment and Forestry

Ministry of Environment and Forestry (2020) Roadmap Nationally Determined Contribution (NDC) Adaptasi Perubahan Iklim. Jakarta (ID): Ministry of Environment and Forestry

Ministry of Environment and Forestry (2021a) Regulation of the Director-General of Climate Change Control P.4/PPI/API/PPI.6/3/2021

Minister of Environment and Forestry (2021b) Indonesia Third Biennial Update Report Under the United Nations Framework Convention on Climate Change. Jakarta (ID): Ministry of Environment and Forestry

Ministry of Environment and Forestry (2021c) Regulation of the Director General of Climate Change Control P.4/PPI/API/PPI.6/3/2021 Regarding Guidelines for the Implementation of the Climate Village Program

Ministry of Environment and Forestry (2021d) Regulation No. 9/2021 on Social Forestry Management

Ministry of Environment and Forestry (2022) Dukungan Pendanaan Adaptation Fund (AF) Atas Upaya Pencapaian Ketahanan Iklim di Indonesia. Presented on Socialization Event Adaptation Fund In Indonesia. 24 May 2022.

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). Qualitative data analysis. Sage.

Mitchell T. & Maxwell S. (2010) Defining climate compatible development. CDKN ODI Policy Brief November 2010.

Moser, S., (2012) Adaptation, mitigation, and their disharmonious discontents: an essay. Clim. Change 111 (2) 165–175, http://dx.doi.org/10.1007/s10584-012-0398-4.

Naess, L. O., G. Bang, S. Eriksen, and J. Vevatne. (2005) "Institutional Adaptation to Climate Change: Flood Responses at the Municipal Level in Norway." Global Environmental Change 15 (2): 125–138.

Nordic Council of Ministers. (2017). Mitigation & Adaptation Synergies in the NDCs. Denmark: Nordic Ecolabel

Palm CA, Smukler SM, Sullivan CC, Mutuo PK, Nyadzi GI, Walsh MG (2010) Identifying potential synergies and trade-offs for meeting food security and climate change objectives in sub-Saharan Africa. Proc Natl Acad Sci:19661–19666. https://doi.org/10.1073/pnas.0912248107

Pham TT, Moira M, Locatelli B, Brockhaus M, Di Gregorio M and Mardiah S. (2014) Integration of adaptation and mitigation in climate change and forest policies in Indonesia and Vietnam. Forests 5:2016–36

Pyke, C.R., B.G. Bierwagen, J. Furlow, J. Gamble, T. Johnson, S. Julius, and J. West, (2007) A decision inventory approach for improving decision support for climate change impact assessment and adaption. Environmental Science & Policy, 10(7-8), 610-621

Ravindranath NH. 2007. Mitigation and adaptation synergy in forest sector. Mitig Adapt Strat Glob Chang 12:843–853

Republic of Indonesia (2021a) Updated Nationally Determined Contribution Republic of Indonesia. (Available from: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Indonesia%20First/Updated%20NDC%20Indonesia%202021%20-%20corrected%20version.pdf)

Republic of Indonesia (2021b) Government Regulations No. 23/2021 on Forestry Management.

Rosenzweig Cynthia and Tubiello Francesco Nicola (2007), Adaptation and mitigation strategies in agriculture: an analysis of potential synergies, Mitigation and Adaptation Strategies for Global Change 12 (2007):855-873.

Schwarze R, Meyer PB, Markandya A, Kedia S, Maleki D, Román de Lara MV, Sudo T, Surminski S (2018) Economics, finance, and the private sector. In: Rosenzweig C, Solecki W, Romero-Lankao P, Mehrotra S, Dhakal S, Ali Ibrahim S (eds) Climate change and cities: second assessment report of the urban climate change research network. Cambridge University Press, New York In Press

Sharifi, A. (2021) Co-benefits and synergies between urban climate change mitigation and adaptation measures: A literature review. Science of the total environment, 750, 141642.

Smith, J.B. (1997) Setting priorities for adapting to climate change. Global Environmental Change 3: 251-264.

Stoorvogel JJ, Antle JM, Crissman CC, Bowen W (2004) The trade-off analysis model: integrated bio-physical and economic modelling of agricultural production systems. Agric Syst 80:43–66. https://doi.org/10.1016/j.agsy.2003.06.002

Suroso, D. S. A., Hilman, D., Setiawan, B., Pradono, Fitriyanto, M. S., Puspitasari, N., and Hastari, M.A. (2021). Climate Change Adaptation in Indonesia: Reviews on Adaptation Governance, Metrics and Financing. Strengthen national climate policy implementation: Comparative empirical learning & creating linkage to climate finance (SNAPFI) National Study Report. DIW Berlin.

Swart, R.O.B., Raes, F., (2007) Making integration of mitigation and adaptation work: mainstreaming into sustainable development policies? Clim. Policy 7 (4) 288–303, http://dx.doi.org/10.1080/14693062.2007.9685657.

UNEP/IVM (1998) Handbook on methods for climate change impacts assessment and adaptation strategies. Amsterdam.

UNFCCC (2001) FCCC/CP/2001/13/Add.1, Decision 7/CP.7 Funding under the Convention

UNFCCC (2011) FCCC/CP/2011/9/Add.1, Report of the Conference of the Parties on its seventeenth session.

UNFCCC (2021) FCCC/PA/CMA/2021/8, Nationally determined contributions under the Paris Agreement, Synthesis report by the secretariat

UNFCCC (2022) Information paper on linkages between adaptation and mitigation. Information paper by the Adaptation Committee.

United Nations (1992) United Nations Framework Convention on Climate Change.

United Nations (1998) Kyoto Protocol to the United Nations Framework Convention on Climate Change.

United Nations (2019) Global Conference on Strengthening Synergies Between the Paris Agreement on Climate Change and the 2030 Agenda For Sustainable Development. United Nations, Copenhagen.

Udvardy, S., S. Winkelman (2014). Green resilience: Climate adaptation + mitigation synergies. Center for Clean Air (CCAP). April 2014. (Available from http://ccap.org/assets/CCAP-Green-Resilience-Climate-Adaptation-Mitigation-Synergies_April-2014.pdf).

van Noordwijk, M., Hoang, M.H., Neufeldt, H., O¨ born, I., Yatich, T. (Eds.), (2011) How Trees and People Can Co-adapt to Climate Change: Reducing Vulnerability Through Multifunctional Agroforestry Landscapes. World Agroforestry Centre (ICRAF), Nairobi, p. 134 pp.

Venema, D.H. and M. Cisse, (2004): Seeing the Light: Adapting to Climate Change with Decentralized Renewable Energy in Developing Countries. IISD, Canada, 174 pp.

Verchot Louis V., van Noordwijk Meine, Kandji Serigne, Tomich Tom, Ong Chin, Albrecht Alain, Mackensen Jens, Bantilan Cynthia, Anupama K.V., Palm Cheryl (2007), Climate change: linking adaptation and mitigation through agroforestry, Mitigation and Adaptation Strategies for Global Change 12 (2007):901-918.

Verheyen, R. (2003) The legal framework of adaptation and adaptive capacity, in: Smith. J.B., Klein R.J.T. and

Huq S. (eds.): Enhancing the Capacity of Developing Countries to Adapt to Climate Change, Imperial College

Press, Londo

Verheyen, R. (2003) The legal framework of adaptation and adaptive capacity, in: Smith. J.B., Klein R.J.T. andHuq S. (eds.): Enhancing the Capacity of Developing Countries to Adapt to Climate Change, Imperial CollegePress, London

Viguié V, Hallegatte S (2012) Trade-offs and synergies in urban climate policies. Nat Clim Chang 2:334–337

Walsh CL, Dawson RJ, Hall JW, Barr SL, Batty M, Bristow AL, Carney S, Dagoumas AS, Ford AC, Harpham C (2011) Assessment of climate change mitigation and adaptation in cities. Proc ICE-Urban Design Plan 164: 75–84

Wijaya S.A., (2022) Kolaborasi Multi Pihak Dalam Pengembangan Prokilim. Presented in MoEF webinar "Pengembangan Proklim dalam Konteks Perhutanan Sosial Melalui Upaya Kelola Sampah yang Komperhensif". 16 Ferbruary 2022.

Wilbanks TJ, Kane SM, Leiby PN, Perlack RD, Settle C, Shogren JF, Smith JB. (2003a) Possible responses to global climate change: integrating mitigation and adaptation.Environ Sci Policy Sustain Dev, 45:28–38

Wilbanks, T.J., (2003b) Integrating climate change and sustainable development in a place-based context. Climate Policy, 3(Suppl. 1), S147-S154.

Wilbanks, T. J., P. Leiby, R. Perlack, J. T. Ensminger, and S. B. Wright (2007) Toward an Integrated Analysis of Mitigation and Adaptation: Some Preliminary Findings. Mitigation and Adaptation Strategies for Global Change 12 (5): 713–725. doi:10.1007/s11027-007-9095-4.

Wilbanks, T.J. and J. Sathaye, (2007) Integrating mitigation and adaptation as responses to climate change: a synthesis. Mitigation and Adaptation Strategies for Global Change, 12, 957-962

Wilbanks,T.J. and R.W. Kates, (2010) Beyond adapting to climate change: embedding adaptation in responses to multiple threats and stresses. Annals Association of American Geographers, 100(4), 719-728.

Wilson C. and McDaniels T. (2007). Linking Climate Change Adaptation, Mitigation and Sustainable Development with Structured Decision-making Tools: The Gateway Program Example. Climate Policy 4, 353 – 370.

Zhao, Chunli & Yan, Yan & Wang, Chenxing & Tang, Mingfang & Wu, Gang & Ding, Ding & Song, Yang. (2018) Adaptation and mitigation for combating climate change – from single to joint. Ecosystem Health and Sustainability. 4. 1-10. 10.1080/20964129.2018.1466632.

Zheng, Y., W. Wang, and J. Pan. 2013. "Low Carbon Resilient City: Concept, Approach and Policy Options." Urban Studies 3: 10–14

Chapter nine

Appendix

9. Appendix

9.1 Appendix I.

Synergy Assessment on Climate Village Program (PROKLIM)

Synergy Type	Sruni Village (Proklim Lestari)			Lita Village (Proklim Lestari)			Lempong Pucung Village (Proklim Utama)		
	Type of activity	**M**	**A**	**Type of activity**	**M**	**A**	**Type of activity**	**M**	**A**
A: In the same work area, related types of adaptation and mitigation activities are carried out	Jugangan (landfill)	Yes	Yes	Processing livestock manure into fertilizer to supply fertilizer needs on agricultural land	Yes	Yes	Making natural protective structures in coastal areas through planting mangrove vegetation which has reached an area of up to 180 ha	Yes	Yes
	Planting vegetation around the spring location	Yes	Yes	Bank waste management, biogas, reforestation activities, and agroforestry practices	Yes	Yes	The use of organic fertilizers for rice cultivation	Yes	Yes
	Reusing water that has been used for specific purposes	Yes	Yes						
	Restrictions on water use	Yes	Yes						
	Efficient management of human, animal, and industrial waste	Yes	Yes						
	Making watertight septic tanks, draining every three years	Yes	Yes						
	Septic tank equipped with methane catcher installation	Yes	Yes						
	WWTP equipped with methane catcher	Yes	Yes						
	Tree planting	Yes	Yes						
	Planting oro-oro land and cliffs	Yes	Yes						
B: At the same time and place, but the nature of each activity is independent, not	Reservoir Making	No	Yes	Diversification of food crops by planting types such as corn, peanuts, soybeans, green beans, sweet potatoes, cassava, and others	No	Yes	Elevating the building structure through the stilt house	No	Yes
	Rainwater Storage	No	Yes	The yard of the house is planted with medicinal plants and various kinds of vegetables	No	Yes	Construction of embankments to overcome vulnerability to the risk of tidal flooding	No	Yes
	Biopore	No	Yes	Making lamps from organic materials as an alternative for lighting when the electricity goes out	Yes	No	Making seven units of tidal floodgates for discharge regulation	No	Yes

	Infiltration wells	No	Yes	Make various kinds of waste recycling crafts	Yes	No	Application of the rice cropping pattern by rotating it with secondary crops in one year of planting	No	Yes
	Waterfall Building	No	Yes	Development of artificial insemination of cattle since 2012	Yes	No	An integrated farming system with Minapadi pattern and also Silvofishery with an area of 2 Ha	No	Yes
	Rorak	No	Yes				Production of bio-ethanol from Nipah fruit, extractor, and evaporator for batik coloring	Yes	No
	Sewerage	No	Yes				Utilization of solar panels	Yes	No
	Construction of spring protection structures	No	Yes				Use of LED lights	Yes	No
	Making local regulations that ensure the springs stay alive	No	Yes				Waste management through composting and 3R	Yes	No
	Merti tuk	No	Yes						
	Flood embankment	No	Yes						
	Provision of flood retention areas (water catchment areas)	No	Yes						
	Evacuation route preparation	No	Yes						
	Submission of information, using traditional/modern communication tools	No	Yes						
	Cooperation in making drainage, dredging drainage channels	No	Yes						
	Elevating the building structure	No	Yes						
	Applying the design of the house on stilts / floating house	No	Yes						
	Terrace construction (including infiltration channels, drainage channels, and terrace reinforcement plants)	No	Yes						
	Application of cropping patterns (rice-paddy-palawija, paddy-palawija-rice)	No	Yes						
	Application of intercultural cropping patterns (intercropping/ turnover)	No	Yes						
	Integrated agriculture (combining agriculture, animal husbandry, fisheries, forestry, & other sciences related to agriculture in one area, Minapadi technology)	No	Yes						

	Management of local potential (protection, development, and utilization of local plants and animals that can support increased food security, hybridization, or crossbreeding)	No	Yes						
	Diversification of food crops	No	Yes						
	Selection of climate-resistant commodities (e.g., water-saving rice, high salinity resistant, floating rice, etc.)	No	Yes						
	Utilization of yard land (cultivating plants, livestock, and fish in the yard)	No	Yes						
	Implementing a mosquito nest eradication program	No	Yes						
	Improve the environment so that there are no puddles	No	Yes						
	Putting fish in ponds/plant pots	No	Yes						
	Forming Jumantik (Flicker Monitor)	No	Yes						
	Implementation of an early warning system to anticipate the occurrence of diseases related to climate change (diarrhea, malaria, DHF)	No	Yes						
	Implementing PHBS	No	Yes						
	Garbage collection and storage	Yes	No						
	Composting	Yes	No						
	3R's activities	Yes	No						
	Goyang sapu activities, by placing waste baskets in each aisle	Yes	No						
	Every house has an infiltration well for household waste management	Yes	No						
	Use of firewood-saving stove	Yes	No						
	Utilization of methane/biogas	Yes	No						
	Glass Tile and Ventilation, Call for Energy Saving	Yes	No						
	Use of organic fertilizer	Yes	No						
	Prohibition of burning straw in rice fields	Yes	No						
	POC Manufacturing and Plant Nutrient Bioactivator	Yes	No						
	Agroforestry practice	Yes	No						
	Land clearing without burning	Yes	No						

9.2 Appendix II.

Enabling Conditions Assessment on Climate Village Program (PROKLIM)

Factors	Sruni (PROKLIM Lestari)	Lita (PROKLIM Lestari)	Lempong Pucung (PROKLIM Utama)
Planning/Regulatory Instruments (at any level)	- District Regulation. Boyolali No. 13/2015 on Environmental Protection and Management (mentioning adaptation & mitigation actions but not related to synergy) - Sruni Village Regulation No. 7/2016 concerning Environmental Preservation and Protection	- Decree of the Working Group on Healthy Villages in Poleonro Village - Decree of the Head of Poleonro Village on the Formation of the Management of the Compost Fertilizer Production Group in Wanuae Hamlet - Decree of the Head of Poleonro Village on the Prohibition of Throwing Garbage in the River - Decree of the Head of Poleonro Village on the Jumantik Supervisor and Coordinator - Decree of the Head of Poleonro Village on the Movement to plant ornamental plants and vegetables in the yard of the house - Decree of the Head of Poleonro Village on Tree Planting and Reforestation Movement - Decree of the Head of Poleonro Village on the prohibition of cutting down trees around the springs - Decree of the Head of Poleonro Village on Reducing the Use of Plastic Waste in Schools and Offices - Circular of the Regent of Bone regarding the Implementation of the Climate Village Program (Proklim) in Bone Regency in 2020 - Decree of the Regent of Bone on the formation of a committee to control the impact of climate change - Decree of the Regent of Bone on the Implementation of Healthy Living Communities - Decree of the Regent of Bone on the executor of the Bone Clean Garbage activity - Decree of the Regent of Bone for 2017, 2018, 2019, and 2020 regarding the determination of the location of Proklim	Village Regulation Number 3 of 2019 concerning Mangrove Ecosystem Management in the Cilacap Segara Anakan Area.
Effective institutions and governance (stakeholders & political leadership)	- Management Team: KTH (Forest Farmers Group) Agni Mandiri; there is a management structure and detailed tasks, and there are detailed rules on institutional mechanisms - Cooperation at the National level: Karina Kas utilization of yard land and Biogas, AOI organic farming - Cooperation at the Provincial level: Organic farming tutor - Cooperation with the private sector: Pertamina, Angkasapura (Planting oro-oro and cliff land) - Cooperation with universities: UNS, UMS, UNB	- Management Team: Proklim Lita's Working Group and Water User Farmers Association (P3A) "Sipatokkong" - Cooperation with Makassar Hasanuuddin University, Makassar State Alauddin University, Watampone Muhammadiyah University, Bone District Health Service, Bone District Food Crop Resilience Service, Bone District Industry Service, and PKK Mobilizing Team Bone District	- Management Team: Krida Wana Lestari Mangrove Group was formed in 2014 with the Decree of the Head of Ujungalang Village Number SK. 140/05/Year 2014. - Supported by several other institutions such as Patra Bina Mandiri Group, Pandu Alam Group, Blessing Fortune Group, and Mekar Canting Group. - Group work plan that has been synergized with CSR programs and activities from Pertamina RU IV Cilacap and Hotel Dafam Cilacap - Support from the district government. Kampung Laut in the form of physical facilities and infrastructure - Support from the district government. Cilacap and Prov. Central Java in the form of program assistance and training activities in the field of fisheries and the environment and the development of MSMEs

			- Support from the central government through the Ministry of Environment and Forestry in the form of mangrove tracking development in the context of developing the Kolak Sekancil tourism object. - Support from universities such as Unsoed, Undip, UGM, and LIPI.
Standard/ Relevant Guidelines	- Regulation of the Director General of Climate Change Control MoEF No. P.4/PPI/API/PPI.0/3/2021 concerning Guidelines for the Implementation of the Climate Village Program (but the word „synergy") has not been mentioned - MoEF Regulation No. 84/2016, it is stated that the Proklim Action is the embodiment of the center on adaptation & mitigation actions that the community has carried out at the local level. - Regulation of the Director General of Climate Change Control MoEF No. P.4/PPI/API/PPI.0/3/2021 concerning Guidelines for the Implementation of the Climate Village Program		
Financial Resources	(data not available)	(data not available)	(data not available)
Knowledge generation, communication, and capacity building	Information dissemination by: 1. Internal (village): Through socialization of Proklim, Livestock Biogas Development, and Waste Bank 2. External: Pro-climate socialization, Biogas WTP development to other groups, study visits, and comparative studies	Internal deployment of actions: Resource Person for Socialization of Environmental Conservation Activities Life, Trainer/instructor of plastic waste processing training activities, Trainer/Instructor of Composting Fertilizer Making Training Activity, Motivator of Yard Utilization Activities, Resource person for health counseling activities. Deploy action externally: - Presentation of Village Development in Indonesia at the 8th ASEAN Village Leaders Exchange Programme International Meeting - Resource Person for Ecosystem-Based Climate Change Adaptation Assistance Activities - Resource persons for the Workshop on Optimizing Village Funds for Climate Change Control - Resource Person for Pro-climate Development Activities - Webinar Resource Person for Climate Village Readiness in Facing the COVID-19 Pandemic	- Invited as a resource person to provide material related to training in mangrove nursery and management or related Integrated management of coastal areas. - Having several local experts in the field of mangrove nursery and management, making bio-ethanol and hand sanitizer from mangrove plants, making batik crafts, processing food ingredients from mangroves and fish pond products - Community empowerment through the Community Service Program and a series of research activities related to mangrove vegetation and coastal area management
Innovation and investments in environmentally sound technologies and infrastructure	Biogas development, entrepreneurship training, technology and harvesting titles, bundling studies, biopores and infiltration wells, rorak construction, demonstration plots for biodiesel and terracing applications, regular board meetings, mentoring, and good practice learning to other groups	- Manufacture of liquid fertilizer is derived from a mixture of organic materials easily obtained by the local community. - Making lamps from organic materials as an alternative for lighting when the power goes out - Make various kinds of waste recycling crafts - Since 2017, livestock manure has been used as fertilizer to supply the integrity of fertilizer on agricultural land. In addition, the development of artificial insemination of cattle has been carried out since 2012. - Diversification of food crops by planting types such as corn, peanuts, soybeans, green beans, sweet potatoes, cassava, and others. Meanwhile, the yard of the house is planted with TOGA plants and various kinds of vegetables - Management of waste bank, biogas, and reforestation activities as well as agroforestry practices	- elevating the building structure through houses on stilts and making embankments to overcome susceptibility to the risk of tidal flooding - making natural protective structures in coastal areas through planting mangrove vegetation which has reached an area of up to 180 ha. - Around the hamlet area, seven units of tidal floodgates were also made to regulate water flow - the application of the rice cropping pattern by rotating the crops in one cropping year. - an integrated farming system with a Minapadi pattern and also Silvofishery with an area of 2 hectares - manufacture of bio-ethanol from Nipah fruit, extractor and evaporator for batik coloring, mangrove seeding and planting, use of organic fertilizer for lowland rice cultivation, use of solar panels, and use of LED lights and waste management through composting and 3R.

Sustainable livelihoods, behavioral and lifestyle	- Reduce the impact on crop failure with the use of liquid and solid organic fertilizers from biogas, bioslurry can be applied directly to the land even in dry conditions - Reducing the potential for greenhouse gas generation and creating new sources of income through Biogas WTP and Portable WTP - The availability of clean water through the provision of PAH in every house increases the adequacy of water availability - Through Biogas IPAL, Portable IPAL, and waste bank management, group members at least increase their income by more than 500 thousand per month.	- Economic Impact; increased income in composting and producing organic cooking coconut oil. Meanwhile, the new income and the beneficiary families are the results of making compost and vegetable pesticides and organic cooking coconut oil. - Social Impact; the acquisition of several types of awards obtained from adaptation and mitigation activities that PROKLIM Lita has carried out - Environmental impact; diseases related to climate change have continued to decline from 2016 until now. Cases of diarrhea and dengue fever were recorded at 0 cases, and drought and crop failure from year to year have continued to decline since 2016. Cases of drought and crop failure were recorded only once but did not cause a significant impact on the event. The reduction in emissions ($TonCO_2$) in the agricultural sector was 137.69 $TonCO_2$, and in the energy sector was 23.02 $TonCO_2$.	Mangrove forest management in Lempong Pucung Hamlet has been carried out in an integrated manner so that it can become one of the tourist attractions that is widely known by the public as Kolak Sekancil. Emission reduction (Ton CO_2eq) total: 516.92 - Forestry Sector: 13.2 - Agriculture Sector: 502.99 - Energy Sector: 0.73

9.3 Appendix III.

Project/Programme Concept Note

A. Project/Programme Summary (max. 1 page)			
A.1. Project or programme	☐ Project ☐ Programme	**A.2. Public or private sector**	☐ Public sector ☐ Private sector
A.3. Is the CN submitted in response to an RFP?	Yes ☐ No ☐ If yes, specify the RFP: _____	**A.4. Confidentiality**	☐ Confidential ☐ Not confidential
A.5. Indicate the result areas for the project/programme	Mitigation: Reduced emissions from: ☐ Energy access and power generation ☐ Low emission transport ☐ Buildings, cities and industries and appliances ☐ Forestry and land use		Adaptation: Increased resilience of: ☐ Most vulnerable people and communities ☐ Health and well-being, and food and water security ☐ Infrastructure and built environment ☐ Ecosystem and ecosystem services
A.6. Estimated mitigation impact (tCO_2-eq over lifespan)		**A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)**	
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD _____	**A.9. Indicative GCF funding requested**	Amount: USD _____
A.10. Mark the type of financial instrument requested for the GCF funding	☐ Grant ☐ Reimbursable grant ☐ Guarantees ☐ Equity ☐ Subordinated loan ☐ Senior Loan ☐ Other: specify_____		
A.11. Estimated duration of project/ programme:	a) disbursement period: b) repayment period, if applicable:	**A.12. Estimated project/ Programme lifespan**	This refers to the total period over which the investment is effective.
A.13. Is funding from the Project Preparation Facility requested?	Yes ☐ No ☐ Other support received ☐ If so, by who:	**A.14. ESS category**	☐ A or I-1 ☐ B or I-2 ☐ C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes ☐ No ☐	**A.16. Has the CN been shared with the NDA?**	Yes ☐ No ☐
A.17. AMA signed (if submitted by AE)	Yes ☐ No ☐ If no, specify the status of AMA negotiations and expected date of signing:	**A.18. Is the CN included in the Entity Work Programme?**	Yes ☐ No ☐
A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words)	Brief summary of the problem statement and climate rationale, objective and selected implementation approach, including the executing entity(ies) and other implementing partners.