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Article

Integration of Adaptation and Mitigation in Climate Change and Forest Policies in Indonesia and Vietnam

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Abstract: Forests play a major role in both climate change mitigation and adaptation, but few policies, if any, integrate these two aspects. Using Indonesia and Vietnam as case studies, we identify challenges at the national level but opportunities at the local level. Although both countries demonstrate political commitment to integrating adaptation and mitigation in their development plans, guidelines for policy and planning treat the two approaches separately. The main challenges identified are lack of knowledge, lack of political will, lack of financial incentives, and fragmentation of mandates and tasks of different government agencies. In contrast, at the local level, integration of mitigation and adaptation is facilitated by subnational autonomy, where mitigation projects might have adaptation co-benefits, and *vice versa*. Our results also show that many actors have a dual mandate that could bridge adaptation and mitigation if appropriate political and financial incentives are put in place. Successful integration of mitigation and adaptation policies

would not only remove contradictions between policies, but also encourage governments that are designing domestic policies to exploit the potential for positive spillovers and realize the benefits of both approaches.

Keywords: adaptation; mitigation; synthesis; Indonesia; Vietnam

1. Introduction

Forests play a major role in both climate change mitigation and adaptation, and several programs, policies and projects reflect this [1]. Forests capture carbon from the atmosphere and store it, whereas deforestation accounts for 6%–17% of global anthropogenic CO_2 emissions [2]. In addition, forest ecosystems provide a wide range of ecosystem services that can help people to cope with and adapt to both current climate hazards and future climate change [3]. For example, mangroves protect coastal areas against storms and waves, forest products provide local communities with a safety net when climate variations affect agriculture, and forests regulate water flows.

Because of their dual contribution, forests can be managed to address adaptation and mitigation simultaneously, with multiple benefits. For example, a mitigation project such as a REDD+ project (based on the REDD+ mechanism, or Reducing Emissions from Deforestation and forest Degradation) can incorporate adaptation measures for communities and forest ecosystems, as this will enhance its sustainability, increase the permanence of carbon storage and avoid the risk of the harmful effects of climate change jeopardizing project outcomes [4]. Integrating adaptation measures can also increase the emphasis that a mitigation project places on immediate local needs, and hence increase local people's acceptance of and interest in the project. On the other hand, if an adaptation project includes activities that contribute to mitigation, it may be able to benefit from carbon funding. Furthermore, donors may favor adaptation projects that also have global mitigation benefits.

Developing activities and policies that consider both climate objectives can increase policy effectiveness and reduce trade-offs. For example, REDD+ projects that do not consider climate impacts and the need for adaptation could increase vulnerability and reduce the capacity of communities to adapt to a changing climate [1]. Similarly, the lack of assessment and management of mitigation outcomes in adaptation projects could increase greenhouse gas emissions, considered as one type of "maladaptation" [5]. In both cases, the trade-offs between adaptation and mitigation would reduce the overall effectiveness of global and national climate change policies and funding. On the other hand, concerns have been raised about pursuing adaptation and mitigation objectives jointly, particularly because of transaction costs and complexity [6,7]. In addition, a forced marriage that requires both objectives to be always met can be counterproductive and can lead to neglect of valuable measures that are effective for only one climate objective [8]. Instead, integration refers to assessing and minimizing possible trade-offs and making mitigation and adaptation actions mutually supportive [9,10]. When trade-offs cannot be avoided, decisions should be made based on the highest priority objective in a specific locality: for example, if adaptation is an immediate need, it should be prioritized [11]. Unlike adaptation, mitigation is not bound to specific geographical locations [9].

Nevertheless, interest in integrating adaptation and mitigation is increasing, as shown by the example of the Green Climate Fund, a fund established in 2011 by the UN Framework Convention on Climate Change (UNFCCC) to "support developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change." This fund is expected to find a balance between adaptation and mitigation in financial allocation and "an integrated approach to funding mitigation and adaptation will be used to allow for cross-cutting projects and programmes" [4]. However, despite this interest, few climate change policies have addressed this integration explicitly [7,12]. The integration of adaptation and mitigation is understood here as the development of policies and projects that aim to contribute to the two objectives in synergy and minimize trade-offs between them [1,13]. These policies and projects would, for example, put in place mechanisms that guard against mitigation projects (e.g., REDD+) increasing the vulnerability of people or ecosystems to climate change.

Using Indonesia and Vietnam as case studies, this paper explores the current state of policy integration, assesses the obstacles and opportunities for integration of adaptation and mitigation in policy design, and reviews evidence on integration at the project level. These two countries are relevant to this analysis for two reasons in particular: many of their sectors and people are vulnerable to climate change, particularly the forestry and agriculture sectors [14,15], and their national governments have developed climate change policies [16–18]. In terms of mitigation, the analysis focuses on REDD+ policy, because of forests' central role in mitigation policy and because Indonesia and Vietnam are leaders in REDD+ in Asia, having introduced national strategies and received significant funding from the Norwegian Agency for Development Cooperation (Norad), the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD) and the World Bank Forest Carbon Partnership Facility [19,20]. Both Vietnam and Indonesia are included in the Global Comparative Study on REDD+ carried out by Center for International Forestry Research (CIFOR).

In this paper, we aim to answer four major research questions: (1) To what extent do key climate change and forest policies consider joint mitigation and adaptation objectives in Indonesia and Vietnam? (2) What is the perception of and the level of engagement of REDD+ policy actors in adaptation? (3) To what extent do local projects consider integrated action? Finally, (4) What are the challenges to policy integration? To answer those research questions, we first set out the key elements of policy integration and how they apply to adaptation and mitigation, and explain our methods of analysis. Second, we present our results of the analysis of the main climate change policies in Vietnam and Indonesia and assess whether policy commitments, institutional settings and organizational arrangements consider the integration of adaptation and mitigation. Third, we examine how policy actors active in REDD+ perceive the linkages between mitigation and adaptation. Fourth, we present evidence from local-level climate change initiatives in Indonesia and Vietnam, and examine whether and how they pursue both adaptation and mitigation goals. We end the paper with a set of conclusions and policy recommendations.

2. Integration of Mitigation and Adaptation Policies: Advantages and Challenges

An integrated policy is one that recognizes all "major consequences of policy decisions," that evaluates policy options based on the forecast impacts of aggregated goals, and that ensures consistency between policy elements [10]. This requires the following three factors. The first is comprehensiveness, which is achieved through a common policy framework and adequate institutions with a comprehensive mandate (in our case taking into account the linkages between mitigation and adaptation). The second is an aggregation of the costs and benefits and the consideration of distributional impacts. The third is consistency across policy goals, including in operationalized guidelines with and across different sectors.

We can understand the integration of adaptation and mitigation in policy as having three aims: (1) an integrated policy framework that accommodates multiple goals of mitigation and adaptation; (2) policy coherence, or the removal of negative spillovers and contradictions between mitigation and adaptation policies; and (3) high-level policy integration, or the realization of mutual benefits and making mitigation and adaptation policies mutually supportive [21].

Integrated strategies do not just require coherence of policies, but a new mix of policy instruments that is consistent - or mutually supportive of multiple goals [22,23]. This entails substantive as well as procedural changes like improved information sharing and network management [24], an element that Hood [25] refers to as 'nodality'. For example, strengthening interaction processes directed at coordinating policy formulation and implementation in domains that have been operating largely independently offers opportunities for previously separated policy communities to learn from each other and reconcile interests that can at times be in conflict [26–30]. In practice, integrated strategies aim to take policy makers away from an end-of-pipe approach and retrofitting policies when negative spillovers become evident, encouraging policy makers instead to anticipate the potential trade-offs and seek opportunities for mutual gains during policy formulation processes [21,31].

For environmental and climate policy, the focus has largely been on integrating sustainability principles and climate change objectives into sectoral policies, such as those for energy, disaster management and health [31–37]. Such mainstreaming efforts are vital, but ensuring coherence and mutual support between mitigation and adaptation policies has largely not yet occurred. Such a policy framework should be set in place, preferably before or at the same time that climate change policies are mainstreamed into sectoral policies. This would avoid a situation where mitigation and adaptation continue to be treated independently in each sector, which increases the risk that possible trade-offs and opportunities for synergies will be overlooked. There is substantial research on the need for and advantages of mainstreaming climate change policies in other sectors [30,33,38], and evidence of the advantages of integrating mitigation and adaptation both generally and within the forestry sector is growing [1,36,39,40]. However, the challenges associated with integrating mitigation and adaptation policies remain underexplored [6,33,41]. In practice, policy integration is difficult to achieve because: (1) it adds complexity to policy processes; (2) it requires long and inclusive decision-making processes; and, most importantly; (3) it forces policymakers to make choices, because objectives of mitigation and adaptation might not always be compatible [27,37]. In other words, policy integration processes can expose the fundamental conflicts of interest and differences in values between policy actors.

One key argument to establish mutually supportive policy frameworks for mitigation and adaptation in advance of sectoral mainstreaming, is to reduce the risk that path-dependencies might hinder subsequent integration, thus undermining policy coherence and consistency of policy instruments [22,42–44]. While such path-dependencies reduce the likelihood of future formal policy revisions to achieve synergies between mitigation and adaptation, policy changes might still occur through more informal processes. These include policy conversion, when institutions adjust to take up new purposes, policy drifting, when changes in how policies operate occur in the absence of formal policy revisions and policy layering, when new institutions are added without dismantling or reforming old ones [45–49]. However, it seems to be more difficult to achieve policy coherence and consistency of policy mixes with such informal policy changes [50].

There are several other factors that can, instead, help facilitate policy integration. Political will is an important enabling factor for integration [51]. Reduction of institutional fragmentation and sectoral compartmentalization can help connect different areas of government with each other or with other policy actors [52,53]. Finally, organizational procedures that are embedded in long-term policy-learning processes are more likely to lead to more coordinated policy making [53–55].

The literature envisions four stages of formal policy integration: (1) the formulation of policy integration as a clear and explicit objective; (2) the integration of processes for formulating different policies; (3) the design of bundles of policy measures that operationalize integrated objectives (new policy mixes); and (4) implementation [21]. The analysis presented in this paper investigates evidence related to the first and the last. We assess the degree to which adaptation and mitigation policies are integrated in Vietnam and Indonesia based on the analysis of existing policies, the mandates of major climate change institutions, the perceptions of policy actors about synergies, and the extent to which local-level projects explicitly integrate mitigation and adaptation objectives.

3. Methods

This study builds on several data collection and analysis efforts and a literature review on synergies between mitigation and adaptation. The first is the analysis of the major climate change mitigation, REDD+ and adaptation policies in Indonesia and Vietnam; this analysis is used to assess the extent to which these policies take into account or seek to achieve synergies between mitigation and adaptation and to investigate the mandates of the main state institutions responsible for these policies. The second effort refers to a national-level policy analysis on REDD+. This included an analysis of the broader institutional and policy context in which REDD+ policies have been developing and a survey undertaken with 52 key REDD+ policy actors in Vietnam and 63 in Indonesia during 2011–2012 [20,56–59]. The survey sought respondents' opinions on the contribution of mitigation to adaptation and the extent to which their organizations, most of which were mainly active in mitigation, were involved also in adaptation.

The third part of the research investigated evidence on synergies between mitigation and adaptation within local-level climate change initiatives. We used a global database of more than 200 adaptation or mitigation projects in forest and agriculture [60]. This database included projects from national plans (National Adaptation Programmes of Action), international mechanisms (Clean Development Mechanism), international funds (Adaptation Fund; Special Climate Change Fund; Global

Environment Facility) or project certification standards (CarbonFix; Climate Community and Biodiversity; Plan Vivo; Verified Carbon Standard), with project documents prepared before 2013, available online in English, French or Spanish, and with sufficient material to be analyzed. This database included three forestry projects in Indonesia and three in Vietnam. As this database did not include all climate change projects in these countries, the selected projects do not form a representative sample of current projects, but serve for illustrative purposes.

4. Lack of Integration of Mitigation and Adaptation Policies and Institutions in Vietnam and Indonesia

Both Indonesia and Vietnam claim to be interested in both mitigation and adaptation, although their emphases differ (Tables 1 and 2). However, our analysis shows that the integration of adaptation and mitigation is limited in both countries. In Vietnam, where adaptation is high on the agenda, we observed no substantial efforts to provide policy guidance (and finance) for implementation of the required integration at the local level. Similarly, in Indonesia, where REDD+ is relatively high on the policy agenda, we did not observe any initiatives that facilitate the integration of adaptation and mitigation.

Table 1. Key mitigation and adaptation policies in Indonesia and Vietnam.

	Indonesia	Vietnam
Adaptation	Indonesia's Climate Change Adaptation Program; Law No. 24/2007 on Disaster Management National Action Plan for Climate Change Adaptation (RAN-API) 2014	Action Plan Framework for Adaptation to Climate Change in the Agriculture and Rural Development Sector, 2008–2020
Mitigation	Presidential Regulation 61/2011 on the National Action Plan for Greenhouse Gas Emission Reduction (RAN-GKR); National REDD+ Strategy 2012	National Payments for Forest Environmental Services: Decree 99; National REDD+ Program 2012
Both adaptation and mitigation	National Action Plan Addressing Climate Change (RAN-PI) 2007; Indonesia Climate Change Sectoral Roadmap 2010 (including a summary roadmap on the forestry sector)	National Strategy for Environmental Protection until 2010 and vision toward 2020; National Target Program to Respond to Climate Change 2008Decision No. 2139 on the National Climate Change Strategy 2011

Table 2. Major government agencies in Indonesia and Vietnam with a climate change mandate.

Indonesia	Vietnam
Ministry of Environment (National Focal Point to UNFCCC)	Ministry of Natural Resources and Environment (focal agency in charge of climate change-related activities)
Ministry of Forestry	Ministry of Agriculture and Rural Development
Ministry of Agriculture	Ministry of Planning and Investment
Ministry of Planning/National Agency for Planning and Development	National Climate Change Committee
National Council for Climate Change REDD+ Agency	National REDD+ office

4.1. Vietnam: Adaptation Focus

Vietnam has demonstrated political commitment to both climate change mitigation and adaptation through several legal documents, such as the National Target Program to Respond to Climate Change 2008 and the National Climate Change Strategy 2011. However, in such documents, adaptation and mitigation are mentioned in different sections and are treated as separate issues; overall, the country seems to have more of a focus on adaptation than on mitigation [61]. In 2013, the Prime Minister approved 10 national priority programs on climate change mitigation and adaptation, seven of which are dominated by adaptation activities [62]. In Vietnam, the Ministry of Natural Resources and Environment (MONRE) and the Ministry of Agriculture and Rural Development (MARD) are responsible for national climate change strategies across sectors. The Ministry of Planning and Investment has even more influence as it is responsible for state budget allocations for climate change strategy and activities, determines government priorities, and regulates climate change financial management and reporting. However, although MONRE is a national focal point for activities related to climate change, it prioritizes investments in adaptation activities (e.g., Decision 1505 QD-BTNMT issued by the Vice Minister of MONRE on prioritized research programs under the National Target Program to Respond to Climate Change).

There are neither incentives nor detailed guidance on cross-sectoral solutions to climate change [63]. Central government commitments to mainstreaming mitigation and adaptation do not necessarily translate into integrated local development plans or actions by local authorities. Local authorities interviewed expect the central government to provide guidance on adaptation and mitigation, because the government is highly centralized and local authorities are reluctant to make independent decisions.

International and domestic NGOs established a climate change working group with the aim of sharing their experiences in local climate change adaptation and mitigation projects with government agencies and the wider community. However, the working group is organized into two separate thematic groups: adaptation and mitigation; the two groups do not conduct any joint activities. Some international organizations (e.g., SNV and WWF) are members of both groups but assign different representatives to each, which might indicate that within organizations too, adaptation and mitigation are treated separately. The chair of the mitigation group (Pers. comm. Nguyen QT, 2013) reported that coordination among group members is weak. The chair of the adaptation group (Pers. comm. Nguyen TY, 2013) attributed the lack of coordination to the lack of interest and experience among policy makers in integrating adaptation and mitigation. The chairs of the two working groups also claimed that the lack of political discussion and policy guidance is the major barrier for integration of adaptation and mitigation. However, they added that the two working groups had recently recognized the importance of linking adaptation and mitigation and had undertaken some initial planning to better link the two. In June 2012, the national REDD+ program was approved but it does not mention adaptation.

4.2. Indonesia: Mitigation Focus

In forest-rich Indonesia, forest-related mitigation is very high on the agenda [57]. The national REDD+ strategy mentions a general need to sustain ecosystem services. For example, it indicates that the expansion of investments in REDD+ should not only support carbon emission reductions, but also maintain environmental services such as biodiversity and regulation of hydrological systems [64]. However, the benefits of adaptation are considered primarily for activities that have major mitigation impacts, such as prevention of wildfires.

Indonesia has also approved a National Action Plan Addressing Climate Change, which also aims at integrating mitigation and adaptation. This document clearly indicates the need for an "integrated effort by the global community to reduce the rate of global warming, combined with efforts to increase the coping capacity" [65]. In this case, however, integration refers to mainstreaming climate change policy into sectoral areas, such as national development plans and health policies, rather than to integrating adaptation and mitigation policies into each other. Similarly, the Indonesia Climate Change Sectoral Roadmap depicts adaptation and mitigation efforts as separate pathways. Mitigation policies are aimed at achieving low-carbon development whereas adaptation policies target adaptation proof development [66]. The 2010 summary of the sectoral roadmap on the forestry sector, explicitly details both adaptation and mitigation aspects and some linkages between them, yet it also recognizes that aspects related to forest adaptation are new and existing strategies address it only indirectly.

In Indonesia, although mitigation and adaptation are included in most ministerial mandates, within these agencies mitigation and adaptation are managed by different departments. Furthermore, the Ministry of Environment is the focal point for climate change, but the Ministry of Forestry has included both climate change mitigation and adaptation in its mandate. Overall planning, however, is within the mandate of the National Agency for Planning and Development (Bappenas), and the Ministry of Finance is key in allocation of funds for development.

Although the REDD+ Agency and the National Climate Change Council engage with actors involved in both mitigation and adaptation (Presidential Decree 46/2008 on the National Climate Change Council and Presidential Decree 62/2013 on the REDD + Agency), there is little evidence of coordination among actors involved in mitigation and adaptation. The REDD+ policy does not specifically mention adaptation to climate change. The Forestry Law of 1999 only mentions climate change in the explanation on forest function for mitigation with ministerial degrees focusing on regulating REDD+. Adaptation is only mention with regard to community and social forestry.

In Indonesia, decentralization allows more autonomy by regional governments. Under the leadership of the National Agency for Planning and Development, a National Action Plan addressing Climate Change was released in 2007, a National Action Plan on Climate Change Adaptation was finalized in 2014, and a National Action Plan on Reducing Greenhouse Gas Emissions has been drafted. In fact, key policies include both mitigation and adaptation efforts, but they are largely treated separately. All provinces have finalized their Regional Greenhouse Gas Reduction Action Plans, designed to include mitigation efforts in their regional development plans. A few have included adaptation activities such as disaster risk management, fire control and community forestry [67], but most of the activities mentioned are in fact development activities redefined as adaptation. This reflects the difficulties of introducing additional aims in existing policy frameworks and the fact

provincial and district governments have limited knowledge or concern about climate change, they lack practical examples on how to address adaptation and mitigation, and they do not have sufficient financial resources [7,17].

5. REDD+ Policy Actors and Their Understanding of Adaptation

In this section, we use the results of research on networking among REDD+ policy actors to understand their perceptions, efforts and practices in relation to adaptation, in order to gather insights on how to integrate mitigation and adaptation. A range of actor groups were interviewed (Table 3).

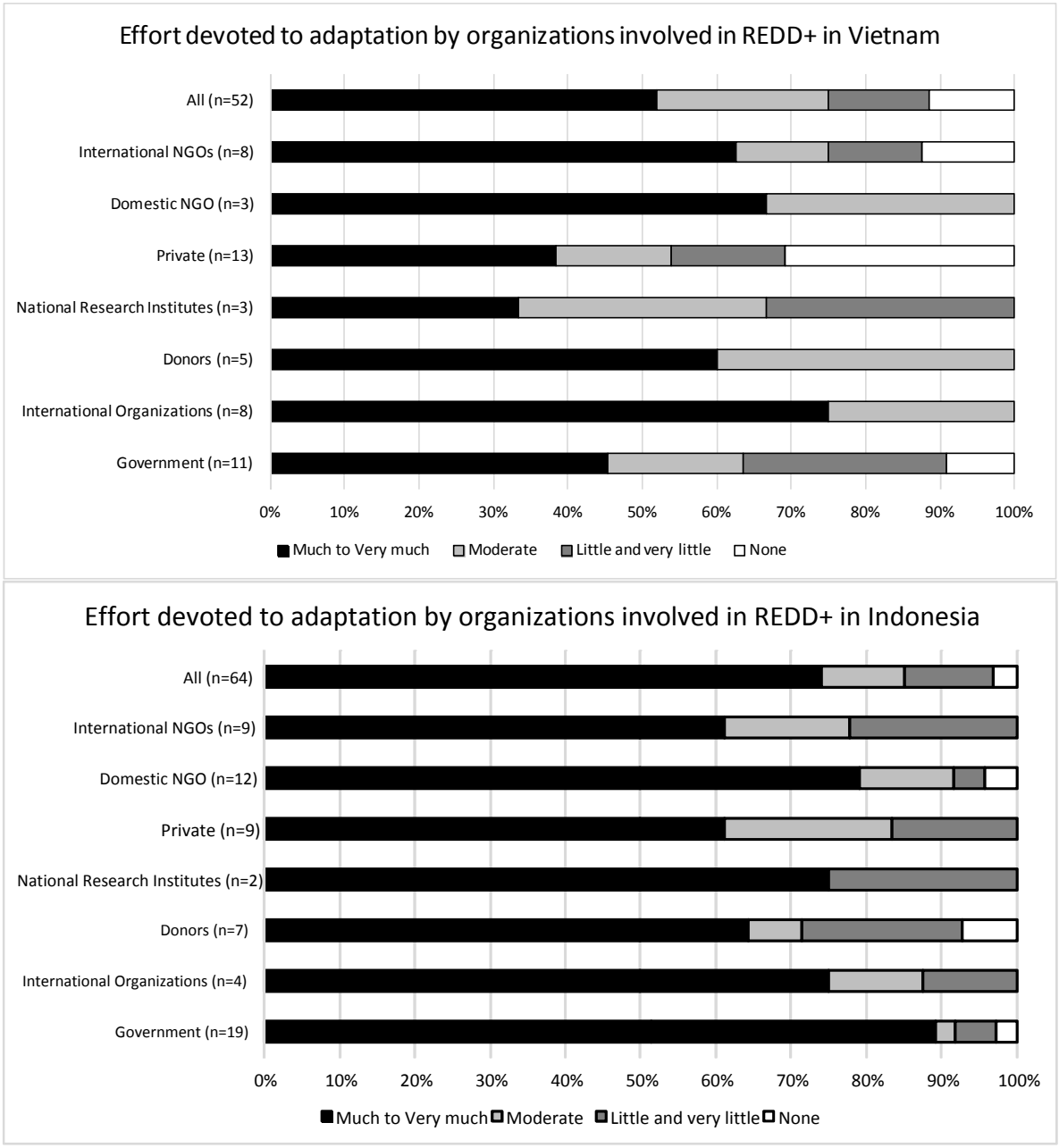
Table 3. Policy actors who participated in the study, by organization type.

Category	Indonesia	Vietnam
Government	19	11
International organizations	4	8
Donors	7	5
National research institutes	2	3
Private	9	13
Domestic NGO	12	3
International NGOs	9	8
Others	2	1
Total	64	52

Overall, 47% of REDD+ policy actors in Indonesia and 52% of REDD+ policy actors in Vietnam indicated the level of effort for implementing adaptation activities as "high to very high" (Figure 1). The organizations that most claimed high to very high attention to adaptation were government agencies in Indonesia and international organizations in Vietnam (75% for both), followed by domestic NGOs in both countries (58% in Indonesia and 67% in Vietnam). The chairs of the adaptation and mitigation working groups in Vietnam said that domestic NGOs devote more effort and resources to adaptation for two reasons. First, donor funding for adaptation efforts is greater than that for mitigation. Second, and this is also true for Indonesia, most domestic NGOs already have some experience in adaptation through poverty reduction projects, whereas mitigation programs (including payments for environmental services (PES) and REDD+ require new technical skills that many of these organizations lack.

Private sector actors involved in REDD+ indicated low levels of effort for adaptation activities in both countries (22% in Indonesia and 38% in Vietnam), as did international NGOs in Indonesia (22%). Most private actors in Vietnam interviewed claimed that, to meet government requirements, they only have to focus on mitigation activities (specifically forest-based PES and REDD+). The Vietnamese Communist Party Committee [63] claimed that the lack of adequate financial and policy incentives is a key factor that discourages the private sector (both generally and in the forestry sector) from engaging in adaptation and mitigation, especially because cumbersome administrative processes impede their access to available climate change funding.

Figure 1. Level of effort directed toward climate change adaptation by organizations involved in Reducing Emissions from Deforestation and forest Degradation (REDD+) in Vietnam and Indonesia.



The findings also reveal differences in the engagement of state actors and international actors (e.g., international NGOs) in Vietnam and Indonesia. Although Vietnam prioritizes adaptation, only 45% of government agencies in Vietnam directed a high level of effort toward adaptation compared with 75% of government agencies in Indonesia. Several factors can explain this. First, the government agencies in Vietnam are focal points with mandates that cover both adaptation and mitigation (e.g., MARD, MONRE). The government actors who do little for adaptation seem to be less involved in REDD+ policy design, but are more active as "facilitators" (e.g., Ministry of Finance) or "executors" (e.g., subnational governments). Second, although the Vietnamese government has committed to both

mitigation and adaptation, in practice the two approaches are treated as separate issues, with more attention given to adaptation. Third, government agencies have difficulties implementing plans because policy guidance from central government for mainstreaming adaptation and mitigation activities in socioeconomic plans is unclear and because they have limited budgets and human resources. Finally, as most government interviewees highlighted, the fact that several government agencies have mandates for climate change adaptation and mitigation both leads to confusion about roles and responsibilities and reduces the efficiency of use of climate change finance.

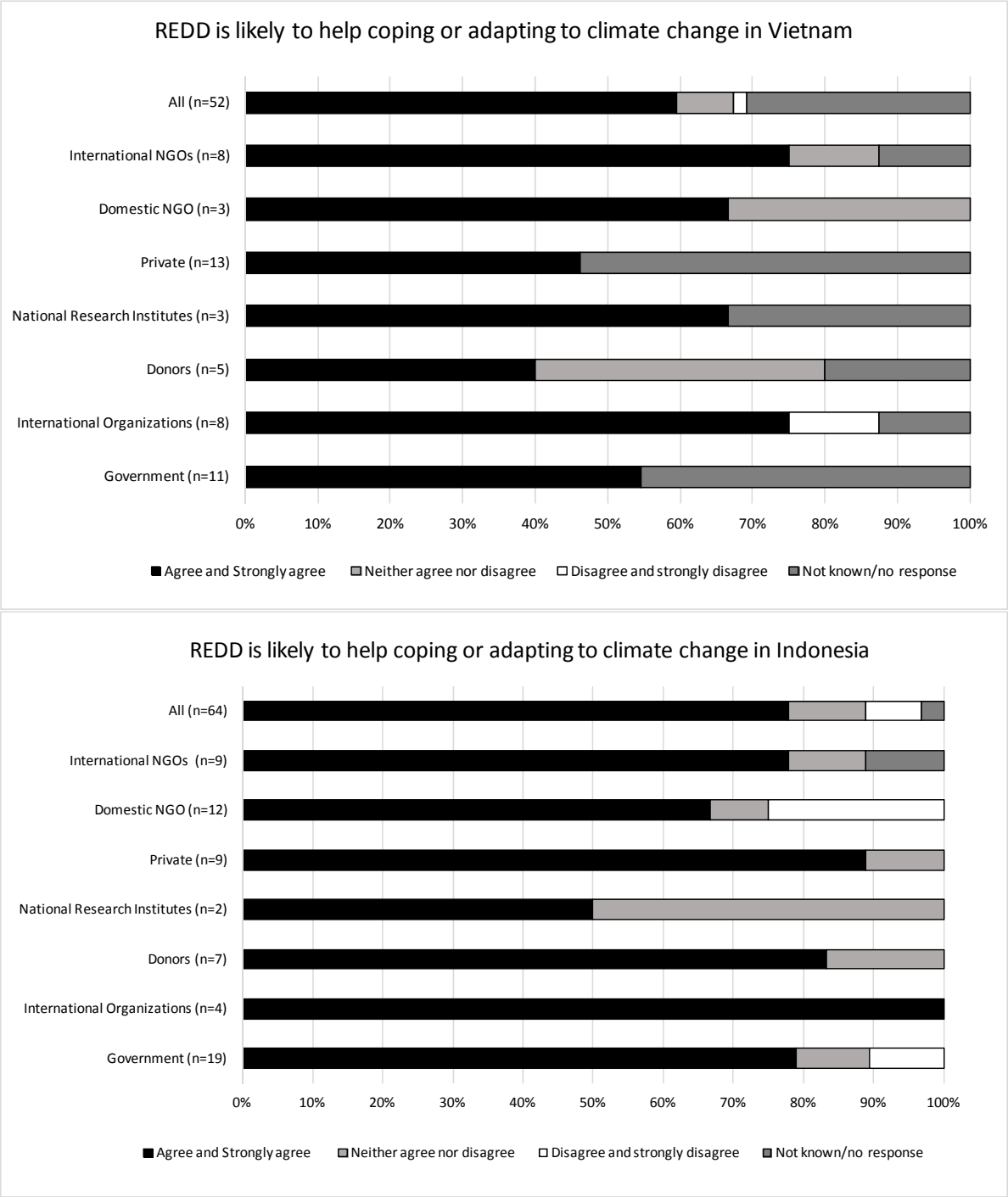
The engagement of donors, international NGOs and international organizations in adaptation differs between Vietnam and Indonesia. Sixty percent of donor organizations, 62% of international NGOs and 75% of other international organizations in Vietnam claimed to direct major efforts toward adaptation, compared with 28% of donor organizations, 22% of international NGOs and 50% of other international organizations in Indonesia (Figure 1). This difference may be attributed to the fact that poverty reduction is the main national priority in Vietnam, and so donors, international NGOs and international organizations have prioritized adaptation programs that reduce vulnerability to have direct and immediate impacts on local communities, such as improvements in local livelihoods. Only a few donors (e.g., Norad, JICA and GIZ) have invested significant resources in mitigation programs.

As seen in Figure 2, 60% of REDD+ actors in Vietnam and 77% of REDD+ actors in Indonesia believe that REDD+ can make a major contribution to adaptation efforts; 67% of domestic NGOs in both countries share the same view.

A major difference between Vietnam and Indonesia is the extent to which state and private sector actors believe that REDD+ will contribute to adaptation. Agreement between government agencies is much lower in Vietnam (55%) than in Indonesia (80%); similarly, disagreement is higher: 40% in Vietnam and 10% in Indonesia. Similar differences were reflected in responses from private sector actors, with 46% of private sector actors in Vietnam stating that REDD+ can contribute to adaptation, compared with 89% in Indonesia. This can be attributed to the finding in interviews that actors in Vietnam exhibit greater skepticism and lack of knowledge about the links between REDD+ and adaptation, whereas those in Indonesia seemed to be better informed. Only two of the 13 private sector actors in Vietnam interviewed saw REDD+ as a new business opportunity. These business actors pointed out that since REDD+ is a new initiative, they did not have any evidence of how it would affect the environment or their business.

When REDD+ was introduced in Indonesia, it was generally welcomed as an opportunity to improve forest governance and was perceived as also contributing to adaptation. The fact that there is high potential to gain financially from REDD+ was certainly a contributing factor to Indonesia's focus on mitigation. However, a few organizations disagree. Some NGOs see REDD+ as another form of permit for forest use that ignores the rights and needs of local communities. Similarly, the anti-corruption commission sees the requirement to achieve emission reductions for REDD+ as a burden for local communities and as a means for developed countries to pay their way out of having to cut emissions themselves.

Figure 2. Actors' views on whether REDD+ can support efforts to adapt to climate change, by type of organization.



6. Experience at the Local Level

Among the six local initiatives presented below, two REDD+ projects in Indonesia have an explicit contribution to adaptation, while none of the other adaptation or mitigation projects considers the other objective, despite having the potential to do so. All projects studied, although not representative of the diversity of local initiatives, show that the consideration of adaptation objectives is starting to take place in some REDD+ projects.

6.1. Mitigation Projects that Consider Adaptation Explicitly

The Rimba Raya Biodiversity Reserve Project in Indonesia is a REDD+ project proposed for a tropical peat swamp forest on the southern coast of Central Kalimantan Province. In addition to designing REDD+ activities, the project proponents have analyzed the possible impacts of climate change on communities and biodiversity, using path analysis diagrams, and have identified the impacts of drought and fire on communities (food security, health, income) and biodiversity. This analysis has been the starting point for designing adaptation measures related to fire (fire suppression, education and training, which are also relevant to mitigation objectives), water (water conservation, improved irrigation techniques), agriculture (crop diversification, harvest rotation and application of new technologies for improved production) and livelihoods (capacity building for income diversification), among others. The project document also reports a potential contribution to ecological adaptation, as the protection and management of large patches of contiguous forest are assumed to increase the resilience of forests in a changing climate [68]. According to the developers of this REDD+ project, well-designed development activities can reduce vulnerability to climate change by enhancing adaptive capacity and increasing resilience. The developers of another REDD+ project in Indonesia in the Ulu Masen Ecosystem of Aceh Province propose to monitor climate change over the project lifetime and to apply adaptive management to respond to climate impacts. The project document recalls the policy environment of Aceh, which recognizes the critical role of forests for local livelihoods. Possible adaptation measures include planting crops and trees that are resistant to heat, pests or drought. These two REDD+ projects share the same concern for the need to integrate different dimensions of ecological, agricultural and livelihood adaptation into REDD+ projects. It should be noted that these two projects applied for certification under the CCB standards [69], which require the integration of adaptation into mitigation projects to attain gold certification. These standards may be an incentive for REDD+ project developers to integrate adaptation into their project design [1]. These REDD+ projects also consider non-forestry activities such as agriculture. This approach of combining several activities in livelihoods and landscapes may also facilitate the integration of adaptation concerns, in contrast to projects that are solely about forestry.

6.2. Mitigation Projects that do not Consider Adaptation Explicitly

Two projects under the Clean Development Mechanism in Vietnam (reforestation project, Cao Phong District, Hoa Binh Province) and Indonesia (mangrove afforestation project, Batam City, Riau Islands Province) do not have any explicit adaptation objectives. The first project involves planting trees on degraded grasslands and shrublands and the second involves working with low-income communities to plant mangroves on tidal flats in three small islands. However, the two projects expect to have positive impacts on livelihoods (incomes, employment, and improvement of natural resources for local communities), which could be the basis for developing adaptation activities, even though modifying the project outcomes and activities from development goals to adaptation goals would require analyzing the vulnerability of local communities to climate change and the resilience of the proposed activities. In addition, the Indonesian project document mentions that planted mangroves will protect people and activities from the impacts of high tides and tsunamis, which is a protective role

relevant to climate change adaptation [3], even though the project document does not make an explicit link to climate vulnerability.

6.3. Adaptation Projects that do not Consider Mitigation Explicitly

Two community-based adaptation projects in Vietnam under the Global Environment Facility aim to apply technologies to reduce vulnerability related to drought and saltwater intrusion in agriculture (Ky Anh District, Ha Tinh Province) and to adapt to climate change through the conservation and sustainable use of natural resources (Huong Tra District, Thua Thien Hue Province). Even though these projects focus on agriculture, they also include forest activities, such as forest protection (in the former project) and mangrove conservation and plantation (in the latter), to increase the sustainability of agriculture and aquaculture. Even though the forest activities will contribute to increased carbon sequestration and reduced emissions, climate change mitigation is not explicitly reported as an outcome in the project document.

The case studies show some advantages and potentials of integration, for example for facilitating project funding through certification (as in 6.1) or through existing mechanism such as the national program of Payment for Forest Environmental Services in Vietnam, from which the two community-based adaptation projects presented in 6.3 could benefit if they showed mitigation outcomes. Mitigation project developers recognize the benefits of reducing risks, even though they may not refer to climate risks specifically (as in 6.2). The interest and participation of local stakeholders in projects can be also enhanced by adaptation measures, which is crucial for project sustainability: the Clean Development Mechanism project in Hoa Binh, Vietnam (in 6.2) was discontinued partly because of the decreasing interest of local authorities and people in the project due to limited financial gain [70].

7. Discussion

7.1. Challenges for Integration at the National Level and Opportunity at the Local Level

As shown above, in both Vietnam and Indonesia, integration of adaptation and mitigation policies faces challenges at the national level because government agencies have similar or overlapping responsibilities and competencies, which creates competition for financial resources (in both countries) and because of their limited experience and understanding to carry out such integration at the local level (in Vietnam). Adaptation is often understood as having a direct impact on local people and therefore includes empowerment activities, whereas mitigation is seen as important for global objectives only, with little benefit for local groups. In addition, climate change policy guidelines tend to put mitigation and adaptation on separate trajectories. In order to overcome such separation, policy change should start with those government institutions responsible for climate change. With their double mandate and formal coordination function they are best placed to undertake steps to improve integration. They can build on valuable experiences from collaboration with key sectoral actors on mainstreaming climate change and explore how to make adaptation and mitigation policies mutually supportive. This would entail a slight change in their function and more explicit mandate that more specifically addresses integration of adaptation and mitigation policies. In the absence of formal

changes in mandates, policy conversion might be required to lead to institutional change needed for future integration. Procedural changes to increase dialogues and share information amongst those government agencies, but also with non-state actors who can contribute valuable expertise, is also needed and should be directed to support multiple goals of climate change policies. A key challenge is to support cross-level and sub-national processes and capacities, given that at the local level the main obstacle to such integration is the limited experience and understanding of local authorities to translate integrated goals in practice.

While challenges to consider the integration of adaptation and mitigation are well-recognized at the central level, at the local level, the same land-use activities can contribute to both objectives. In both countries, subnational state actors have the authority to integrate adaptation and mitigation. However, this integration will not occur automatically: even though those involved in mitigation activities perceive that REDD+ is likely to help people to cope with or adapt to climate change, REDD+ policies and initiatives need to go beyond straight mitigation activities in order to achieve adaptation outcomes. The projects presented as examples show that mitigation project design can incorporate adaptation objectives and that activities can be adjusted to achieve adaptation outcomes. However, there will always be adaptation activities without mitigation outcomes (and *vice versa*) and a "forced marriage" should be avoided. For example, requiring all adaptation activities to deliver mitigation outcomes could block some good adaptation activities because of their absence of mitigation outcomes [6].

As the analysis of local examples also showed, adaptation project developers seem to have few incentives to consider mitigation: because funding for adaptation and mitigation comes from separate streams, these developers have to show adaptation outcomes only. Conversely, mitigation project developers may have more reason to integrate adaptation, for example, to attain CCB certification or to increase project sustainability and carbon permanence in a changing climate.

At the local level, Indonesian project developers and policy makers seem to consider adaptation in mitigation projects more than their counterparts in Vietnam. The lack of policy guidance from the central government on how to integrate mitigation and adaptation policies in current government plans and planning coupled with local governments' limited understanding and knowledge of these topics have impeded such integration in Vietnam.

7.2. Bridging Actors Who can Promote Both Adaptation and Mitigation

As shown in both countries, several government agencies and REDD+ actors (e.g., international actors and private sector actors) have mandates for both adaptation and mitigation. In theory these actors can become bridging organizations, if there are incentives to achieve integration.

On the one hand, international and national policy actors involved in either adaptation or mitigation have different political agendas and assign different priorities to different locations and groups, which may hinder the integration of adaptation/mitigation. For example, the most vulnerable people targeted by adaptation and the high-emission activities targeted by mitigation may not be in the same places and sectors. On the other hand, these actors can also have a role to play in creating the right incentives (either political or financial) to encourage national and local actors to take a dual approach in achieving both mitigation and adaptation outcomes in the most efficient way [6,71]. In fact, many

international NGOs see adaptation as a co-benefit of conservation and mitigation initiatives (e.g., FFI in Indonesia).

Few REDD+ actors from the private sector (in both countries) have integrated adaptation and mitigation in their agenda. This lack of integration may be explained by the rationale of the private sector (primary interest is in capturing funding from mitigation initiatives) and the way that international negotiations and instruments, including global climate change funds, treat adaptation and mitigation separately. However, in practice, private sector actors who see REDD+ as a business opportunity can also take adaptation objectives as a co-benefit of their original mitigation projects.

It is nearly a decade since these two policy arenas emerged, and both actors and agendas have changed during this time. However, the opportunities for integration of adaptation and mitigation are still not fully understood and have not yet been realized. Therefore, further knowledge is needed on how to translate knowledge about synergies for effective policy integration and how institutional bridges and policy brokers can facilitate better collaboration between these two policy arenas.

8. Conclusions

We have argued in this paper that achieving effective integration of adaptation and mitigation objectives requires policy processes and policy frameworks that facilitate minimization of trade-offs and realization of potential synergies. Although there is an opportunity to enable synergies between adaptation and mitigation at the local level, *ad hoc* local-level integration will remain limited in delivering towards both, mitigation and adaptation objectives, but require a deliberate process for integrating mitigation and adaptation policies. Furthermore, for successful integration of mitigation and adaptation policies, governments that are designing domestic policies would have to actively seek ways to exploit the potential for positive spillovers, realize mutual benefits and make policies explicitly mutually supportive. In addition to removing contradictions between mitigation and adaptation policies (and within policies), integration is expected to help avoid the negative consequences of adaptation and mitigation policies, as it aims to reduce both emissions from land use and the vulnerability of people and ecosystems to climate change impacts. Despite some efforts, few results are visible. Reviewing existing policies is necessary to identify ways to minimize their potential negative impacts and to achieve the twin objectives of emission reductions and adaptation. Capacity building for local government, clarity in state actors' roles and responsibilities, and clear guidance on how to integrate climate change mitigation and adaptation are required to address these challenges. Actors that have dual mandates could also help to bridge efforts to integrate mitigation and adaptation.

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Author Contributions

Thuy T. Pham, Moira Moeliono, Bruno Locatelli and Sofi Mardiah undertook the analysis of the evidence data. Maria Brockhaus and Monica Di Gregorio designed the research methods of Module 1 of the GCS on REDD+ and contributed to the methods and theoretical section on policy integration. All authors contributed to writing the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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