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Article

The Three Dialectics of Adaptation Finance in Vietnam

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Abstract: The goal of this paper is to analyze the complex institutional landscape of adaptation finance in Vietnam, a middle-income country highly vulnerable to the impact of climate change. While resources from international organizations and national authorities occupy a prominent position in adaptation funding, the use of local resources that directly or indirectly support adaptation practices is also an important factor to consider. We hypothesize that it is that interplay between official climate change finance on the one hand and local social dynamics on the other hand that shapes the structure of adaptation funding. These very particular financing circuits consequently determine the kind of adaptation actions that are actually implemented. The paper unfolds the adaptation finance flows at all scales by using qualitative field studies, technical and legal reports, and a wide-ranging literature on adaptation project financing, and thus identifies three types of dialectical tensions that might hinder Vietnamese institutional readiness for adaptation finance: the adaptation/development financing nexus, the adaptation/reaction financing behaviors, and the endogenous/exogenous financing dichotomy. Ultimately, the paper derives from these dialectical tensions within the architecture and functioning of adaptation finance key takeaway messages for a prospective analysis of adaptation funding that better informs adaptation finance policies.

Keywords: climate change; adaptation finance; social capital; institutional readiness; Vietnam

1. Introduction

Since the 2015 Paris Agreement, climate change mitigation and adaptation strategies have become a major target for public aid and public policy dialogue at both the national and international scales. In the context of developing and emerging economies, efforts are often put more into adaptation than mitigation. This is partially justified by the fact that those countries will face the bulk of the impacts, while they are also in need of a steady increase in income to catch up with development opportunities. A good part of the Official Development Assistance (ODA) has been specifically redirected toward adaptation actions, recognizing the UN principle of “shared but differentiated responsibility”. For example, the Green Climate Fund (GCF) is endowed with a USD 10 billion fund to support mitigation and adaptation actions in developing and emerging countries on a par basis.

In Vietnam, a middle-income country often considered as one of the most vulnerable to the impact of climate change, most of the population, main cities, agriculture, and industry are located in the two

major deltas, the Mekong River delta and the Red River delta, which are highly exposed to climate related hazards, especially to drought and flooding [1], as well as sea-level rise in the longer run. Other expected climate change impacts include more frequent and severe salinity intrusion, typhoons, and heat waves, among other hazards [1]. In face of global warming, the Vietnamese authorities have started to act even before the Paris Agreement. As soon as 2008, they created the National Target Program to Respond to Climate Change and have started to draw action plans and policies for climate change response with a strong focus on adaptation. To implement these adaptation policies, the Vietnamese government has received significant financial support from international organizations, especially bilateral and multilateral partners [1]. The country has also allocated its own budget for climate change responses. At the local level, in addition to the government support, communities have tried their best to mobilize resources for dealing with sudden climate related hazards. Many studies have shown for a long time already how different categories of households tend to use their own available resources to adapt to climate variability [2–5].

Despite this variety of financing sources, it seems that funds for adaptation actions at the national level may be connected with difficulty to local adaptation needs. Moreover, projects that are labelled as adaptation may cover actions that do not have climate adaptation as their main target [6,7], that are not really tied to a specific reaction to climate changes [8], or that may contribute to adaptation for specific groups or areas but may increase vulnerability of other groups or areas now or in the future [8]. Conversely, financing mechanisms and resources mobilized for adaptation are not necessarily earmarked as such, and it is even highly possible that so-called adaptation finance represents only a portion of the actions that can be considered as adaptation action. In practice, adaptation goals (and practices) are intertwined with other goals and practices (such as infrastructure development, livelihoods improvement, and reducing risk related to climate hazards for instance), and this will blur the translation from adaptation finance to actual adaptation actions [9–11]. In the end, monitoring, reporting, and verifying the alignment of adaptation funding with the necessary protection against uncertain future climate trends is crucial.

Institutions of adaptation finance thus need to be analyzed well beyond the officially earmarked adaptation finance instruments. A much larger set of institutions, formal as well as informal, participates in Vietnam's response to climate change and will broaden our understanding of the country's readiness to tackle future changes [12]. This set of institutions is delineated in very general terms by those actors and entities that use, allocate, or expand resources contributing to improve adaptive capacities and reduce vulnerability in face of climate change. How do these institutions allocate and use climate adaptation funds? What criteria would define their readiness in the face of future climate impacts?

The existing literature on adaptation finance primarily focuses on international funding and gives limited attention to adaptation finance at the national and subnational levels [13,14]. Only a small number of studies (e.g., [13,15,16]) have examined how adaptation funding is allocated from national to subnational and to the community level [17]. Meanwhile, many actions at the local level contribute to climate adaptation but are not necessarily identified as such and therefore are not studied within the climate adaptation literature. Thus, there might be a mismatch between what is funded through formal climate adaptation finance and climate adaptation that is actually implemented on the ground. Moreover, no study shows how the climate adaptation funding actually flows within a broader set of institutions and actors. The current state of the art does not bridge the gap between the official climate adaptation finance institutions on the one hand and the actual adaptation finance practices at all scales on the other hand.

This paper aims at addressing this gap through an in-depth country case study by studying adaptation finance from international and national to local levels in Vietnam. Drawing upon this case study, we aim to contribute to the understanding of how adaptation financing may take place in practice in the Vietnamese institutional context. Therefore, we contribute to building an analytical framework on institutional readiness for climate adaptation finance in Vietnam. To this end, we will address the following questions: (i) How is adaptation funding structured in Vietnam? (ii) Where

do resources for adaptation come from and how are they used and allocated? (iii) What factors influence the allocation and use of adaptation funding? and (iv) How do funded adaptation actions contribute to building adaptive capacities, reducing vulnerability and enhancing institutional readiness for adaptation finance?

The remainder of the paper is organized as follows. Part 2 presents the methodological and conceptual framework of our analysis of institutional readiness for climate adaptation. Part 3 will dig into the complex landscape of adaptation finance and the way resources for adaptation circulate in the specific case of the Vietnamese formal and informal institutions. Part 4 will describe the main results and elaborate the notion of institutional readiness based on three dialectical tensions between adaptation actions and Vietnamese society's characteristic dynamics. Part 5 elaborates on these three dialectical tensions and their policy implications for adaptation finance in Vietnam. Part 6 concludes.

2. Methodological and Conceptual Framework

2.1. Conceptual Framework: From Institutional Readiness to Social Capital for Adaptation Finance

In order to analyze the landscape of actors of adaptation finance and the circulation of both formal and informal funds, this paper builds on the concept of institutional readiness for climate adaptation finance. This notion of institutional readiness has been used recently in various attempts to assess the role of institutions in the progress toward adaptation actions. There is, however, no single definition of the objective criteria behind the idea of readiness for adaptation.

A first strand of literature tries to promote various more or less operational assessment frameworks at national level that can be used indifferently across countries. Berrang-Ford and colleagues [18] propose a comprehensive conceptual framework for assessing adaptation progress by governments that they consider scalable over time and across contexts. They insist on indicators of "adaptation efforts", which they decompose into "leadership, organization, and policy". Ford and King [12] propose a framework to examine adaptation readiness, as a complementary approach to adaptive capacity, a concept that focuses on the strength and existence of governance structures and policy processes that determine whether adaptation takes place. Among others, the credibility of local climate adaptation policies has also been assessed through a conceptual and operational assessment framework applied to four cities around the world in Olazabal et al. [19].

This approach has been applied to adaptation finance itself, and used as such by various international institutions. In 2012, the United Nations Development Program (UNDP) proposed a framework for the concept of climate finance readiness. It was defined as "the capacities of countries to plan, access, deliver, monitor, and report on climate finance, both international and domestic, in ways that are catalytic and fully integrated with national development priorities and the achievement of the Millennium Development Goals." (UNDP, 2015, p. 4) [20]. Four key capacities were highlighted through this concept: (i) capacities to plan for finance; (ii) capacities to access different forms and types of finance; (iii) capacities to deliver finance and implement/execute activities; (iv) capacities to monitor, report, and verify financial flows and evaluate results or impacts. In the same vein, and in order to support developing countries in strengthening their capacities in climate finance, the German Agency for International Cooperation (GIZ) has developed a "Ready for Climate Finance" approach. It includes all dimensions of the UNDP perspective above but emphasizes the involvement of the private sector. Even more recently, following Samuwai and Hills [21], while acknowledging that "no definition of readiness has achieved broad consensus, it is generally understood as the process of enhancing the capabilities of developing countries to receive and spend climate finance wisely, as well as report on its transformative impacts." This definition translates into "facilitating an attractive enabling/investment environment so that private finance can catalyze public climate finance". Contrary to this homogenizing approach to the readiness for adaptation financing, we develop a more institutionalist approach, which tends to understand adaptation financing in specific context.

A second strand of literature understands the importance of the specificities of time and context to develop the notion of institutional readiness. They offer an important collection of case-studies, from the analysis of the readiness for climate change adaptation in the Arctic [22] to the power interplay between Bangladesh and India over the Brahmaputra River leading to a dynamic of “non-decision making” over climate issues [23]. These studies consider the institutions as the result of historical layers of specific human and natural agencies, so that the notion of “readiness” for future adaptation cannot properly be assessed in generic terms. This approach pays particular attention to the environmental geography of the studied society, its particular history in relation to specific climate events, and the power relationships that have emerged out of these particular experiences. In this second strand of literature, these preliminary steps are considered crucial to develop any reasonable assessment of the institutional readiness of the country.

In our paper, we do not define institutional readiness by a set of pre-defined properties of institutions, but rather through the dynamic and always evolving practice of adaptation finance as observed at the different institutional levels. Hence, we do not pretend to promote an operational framework to get closer to this institutional readiness. Rather, we suggest three dialectical tensions that arise from our institutionalist approach to adaptation finance in Vietnam. These tensions are the institutional readiness in labor, which would give birth to efficient adaptation financing if they can be trespassed.

To analyze resources flow and adaptation practices at the local level, in particular to cope with climate-related disasters, we specifically mobilize two main conceptual frameworks to expand the notion of institutional readiness: disaster anthropology and the social capital approach applied to climate change adaptation [24–26]. The first intends “to break with the ‘tropism of disaster’, to look at the multiple recompositions at work in the field” (Langumier and Revet 2011). While we tried to understand how individuals interpret and explain disaster events, we did not focus only on the disasters’ unfolding and impact, but we also investigated the daily activities and changes following disaster events, even if they are not directly connected to these events. The second approach is closely connected to Putnam and Bourdieu’s definitions of social capital [27,28]. It relies on the idea that “the diversity of interpersonal ties that constitute social life is a fundamental resource that can facilitate individual and collective change when faced by climate change or other external pressures” (Pelling and High 2005, p. 314) [26]. In this perspective, we examine the different resources that individuals can access through their personal networks of relation or through collective actions. We address the three components of social capital, including the formation of social capital, the operation of social capital, and the utility of social capital. To investigate the interactions, arrangements, and exchanges set in place at the local level outside, but connected to, formally regulated institutions, we mobilized the concept of “shadow systems” [29] as used by Tran & Rodelad [30] in Vietnam to analyze farmers’ adaptive knowledge into flood management and adaptation.

2.2. Research Methods

We adopted a qualitative approach to guide the data collection and interpretation process [31]. Indeed, quantitative data on adaptation finance are scarce and largely inconsistent. They could not support a coherent quantitative assessment. Furthermore, as we aimed at broadening the scope of adaptation finance institutions to local informal financing circuits, only a qualitative approach could give justice to this circulation of intangible assets [32]. Our study combined two types of sources and methods: (i) documents review, combined with semi-structured interviews and observations to develop a qualitative analysis of climate change adaptation policies, and (ii) adaptation processes and practices at the community level in a rural commune in northern Vietnam based on the case study research strategy [33] using the socio-anthropological approach. This multi-scale qualitative approach allowed us to investigate how adaptation funding is structured, used, and allocated from the local level to the national one. The data collection process and methods are developed below.

We first conducted an analysis of secondary sources with a focus on existing policies, government documents, and research or project reports related to climate change adaptation policy and its implementation both at the national and local levels in Vietnam. The objective of this analysis was to determine the formal adaptation funding structure, key actors, the funding flows and mechanisms, and the extent to which adaptation actions funded by the government contribute to improve adaptive capacity and reduce climate vulnerability. It used references from a search on key bibliographical repositories (mainly Web of Science, Science Direct, Wiley Online, Emerald, Taylor and Francis, Springerlink, Proquest, Sagepub, JSTOR, Routledge handbook online, Cabdirect, MDPI, Water Alternative, Social Services Database, Project Muse, Pubmed, SSRN, DOIJ, and Ecology and Society) using the keywords “adaptation, Vietnam, Mekong”.

This task was further enriched by our observations and field research experience during meetings, workshops, group discussions, and informal non-structured discussions with various actors in Binh Dinh, Lao Cai, Thua Thien Hue provinces and in Ha Noi and Can Tho cities from 2016 to 2020. This experience was mainly built from our collaboration with both governmental and non-governmental organizations (e.g., provincial department of natural resources and environment, climate change coordination office, NGOs, research institutions, etc.) involved in climate change adaptation activities. The main groups of informants we interacted with included: (i) national government agencies under the Ministry of Natural Resources and Environment (MoNRE), the Ministry of Agriculture and Rural Development (MARD), and the Ministry of Construction; (ii) provincial and district level agencies in charge of climate change, disaster risk management, urban development, planning, and investment and finance; (iii) international and Vietnamese NGOs; (iv) mass organizations; (v) local communities; and (vi) research institutions.

Second, we conducted 15 semi-structured interviews during the period between 2016 and 2020. Each interview generally lasted 45 to 60 min. We selected key informants based on their role and responsibility at relevant government agencies and their expertise and knowledge regarding the topics addressed. Participants came mainly from government agencies in charge of areas related to climate change adaptation and to the management of funding for adaptation projects, and research and training organizations in Can Tho, Binh Dinh, and Lao Cai. Following usual ethics protocols, respondents were provided with information related to the objective of and the reason they were selected for interviews and were informed that their responses and identity would remain confidential, and they had the right to withdraw from the study at any time. Open-ended questions were designed to gather qualitative data on availability and sources of adaptation funding at the local level, how existing funding has been allocated to adaptation efforts, and on the factors influencing the way adaptation funding is used. In most cases, informants preferred not to record the interview. Therefore, researchers took notes during and after each interview.

Finally, we conducted an in-depth ethnographic fieldwork between 2019 and 2020 in a rural commune in the Vietnam northwest upland, where so-called “ethnic minorities” suffered from an unprecedented destructive flashflood in 2018. The research team is composed of four anthropologists, three Vietnamese and one French. All the interviews were conducted in Vietnamese with the informant’s freely given, informed consent to participate in the study. The commune is composed of 16 villages located in a valley at an altitude of 400 m. 5,476 inhabitants are distributed in 1,204 households on a total surface of 3,854 ha. Among the 5 ethnic groups that populate the commune, 97% are registered as Tày people. Through a socio-anthropological perspective that grants a central place for micro-localized in-depth investigation, we studied the material impact of the disaster, the ways local people experienced it, and what responses and coping strategies they consequently have adopted. The data collection combined immersion in local life (agricultural activities, ceremony, official meeting, festivities, etc.), direct observation of practices, micro-quantitative census (focusing on households and infrastructure damages, financial resources used by households for adaptation, housing changing practices, and agrarian system and agricultural innovations), local written sources (e.g., official reports and personal documents), informal talks, and semi-structured interviews. In total, we conducted 135

interviews with villagers, village leaders, local authorities, and cooperative members. Our interview frame addressed the following topics:

- The course of the event (flash flood),
- Other weather-related hazards experienced,
- Assessment of material damages and losses (agriculture, infrastructure, housing, personal assets, etc.),
- Narratives about and perception of the event by different local actors (farmers, authorities, household with off-farm activities, young, men, women, elders, damaged household, non-damaged household, etc.),
- Emergency intervention,
- Post-shock reconstruction,
- Forms of support (State, private, and personal networks),
- Preventive and risk reduction measures,
- Responses and adaptation practices,
- Weather-related risk and climate change perception.

It is important to note that, prior to the current field research, we carried out an anthropological research in this commune between 2008 and 2012 to study the dynamics of social change at the local level and the way external development projects have been implemented and locally reshaped [34]. Thus, our current study benefits from an in-depth and long-term knowledge of the population and of the local socio-economic dynamics.

3. The Landscape of Adaptation Finance in Vietnam

3.1. Adaptation Finance Actors in Vietnam

3.1.1. International Organizations

As Vietnam has long been identified as highly vulnerable to climate change, bilateral and multilateral organizations have provided significant financial support to the country to respond to climate change. Funding from these organizations is often in the form of Official Development Aid (ODA) [35], transferred directly to the central government budget. Some grants have also been provided but the amount is relatively small. To date, the World Bank, Japan, Germany, France, and the Asian Development Bank (ADB) are among the biggest climate change related donors in Vietnam. In addition, the United Nations agencies, especially the United Nations Development Program (UNDP), have played an important role in supporting climate change adaptation in Vietnam. For instance, UNDP often mobilizes resources and acts as a direct recipient from financial institutions such as the Green Climate Funds or Adaptation Funds, and then works with Vietnamese partners, especially the Ministry of Natural Resources and Environment (MoNRE) and the Ministry of Agriculture and Rural Development (MARD), to implement adaptation projects.

In addition to the funding provided directly to the Vietnamese government, bilateral and multilateral organizations have also funded non-governmental organizations (NGO), research institutions, and private consulting firms to implement adaptation projects in Vietnam. Some of the most active international NGOs in the field of climate change adaptation in Vietnam are Oxfam, Care International, World Wildlife Fund (WWF), Catholic Relief Services, ActionAid Vietnam, SNV, and the Institute for Social and Environmental Transition (ISET).

3.1.2. Government Actors

The Vietnamese national authorities consider the response to climate change as one of their top priorities and a number of climate-related policies have been approved and implemented over the last decade. There are multiple government agencies involved in climate change response activities, among

which the Ministry of Natural Resources and Environment (MoNRE) plays the most important role: it is assigned by the national government to lead and coordinate the climate change policy development and implementation in Vietnam. MoNRE was the leading agency for the implementation of the National Target Program to Respond to Climate Change—NTPRCC (2011–2015), later transformed into the National Strategy on Climate Change and the National Target Program to Respond to Climate Change and on Green Growth—NTPRCC-GG (2016–2020). The Department of Climate Change of MoNRE acts as the Standing Office for the National Committee for Climate Change (NCCC) and for the Support Program to Respond to Climate Change (SPRCC). The SPRCC is the main financial mechanism established to support the implementation of the NTPRCC and NTPRCC-GG. At the provincial level, the Department of Natural Resources and Environment (DoNRE) is the leading agency for climate change responses. However, there is neither an agency nor a permanent government officer in charge of climate change at the district and commune levels.

As the national State management bodies for disaster risk management, the Ministry of Agriculture and Rural Development (MARD) and its Disaster Management Authority play a central role in climate change responses, in complement with MoNRE. Specifically, MARD is responsible for developing and implementing policies, projects, and programs to address the impact of natural hazards such as flooding, typhoons, drought, and saline intrusion. The ministry serves as the permanent body of the Central Steering Committee for Natural Disaster Prevention and Control chaired by a Deputy Prime Minister. The minister of MARD is the permanent vice-chairman of this committee. A similar structure and division of responsibilities are applied at the provincial and district level where the Department of Agriculture and Rural Development (DARD) and the district level Division for Agriculture and Rural Development play the leading role in disaster risk management.

MoNRE and MARD work closely with the Ministry of Planning and Investment (MPI) and the Ministry of Finance (MoF) to review and plan climate change and/or disaster risk management budgets. MPI is responsible for the overall development strategies, planning, and investment at the central level and for attracting, coordinating, and managing ODA. MoF is the State management body for finance management, budget allocation, and tracking of government budget spending.

3.1.3. Local Actors

At the commune levels, as far as State institutions are concerned, the People's Committees are the main bodies for managing or coordinating adaptation projects in cooperation with the implementing organizations and agencies. Within the People's Committees, the Steering Committee for Natural Disaster Prevention and Control is the entity in charge of Disaster Risk Management. This committee is not specifically mandated to implement adaptation to climate change. However, as there is currently no organizational structure and staff dedicated to climate change adaptation at the local level, and as many adaptation practices are associated with weather-related disasters, the Steering Committee for Natural Disaster is often *de facto* involved when an adaptation project takes place. This committee works under the leadership of the chairperson of the communal People's Committee and involves officials in charge of different areas (e.g., agriculture, forestry, natural resource management, finance, land, infrastructure), police officers and local army, and representatives of mass organizations (such as Women Union, Farmer Association, Youth Union, etc.: see below) as members. Sometimes, it also includes village leaders and local communist party secretaries. The communal Steering Committee for Natural Disaster often follows technical instructions from the equivalent entity at the district level and is responsible for supervising, coordinating, and directing disaster prevention and control activities, including the development and implementation of the communal action plan to respond to natural hazards and the organization of training and awareness raising activities.

While all the commune level People's Committees officials are potentially mobilized to implement climate related disasters and sometimes adaptation interventions, some are more frequently involved, such as officers in charge of agriculture development and of construction and environment. Indeed, these officers are often the local contact persons for programs set up by the district and the provincial

government, in particular by the agriculture and rural development and the natural resources and environment agencies.

There are also “mixed entities”. They are not civil servants but still representatives of the State, and they operate within bodies supervised by the State. Local mass associations are an important actor of this kind. They are usually involved in both disaster recovery and adaptation projects. Under the aegis of the Fatherland Front and thus the Communist Party, these associations provide an organizational matrix for the various bodies of society such as women, peasants, veterans, the elderly, and youth. The Red Cross, which is particularly active in supporting populations affected by natural hazards, is also considered a mass association. Being present at all levels of the bureaucratic apparatus, mass associations serve as a transmission belt (of information or resources) between the basis and the top and are, therefore, often mobilized for the implementation of adaptation-related measures at the local level and sometimes for the mobilization and the distribution of financial resources.

3.2. *The Flows of Formal Adaptation Finance*

3.2.1. From International to National and to Provincial Level

Significant funding has been mobilized by the Vietnamese government for climate change actions. McElwee [36] states that “the country has requested international pledges and earmarked national funding of more than USD 7 billion over the past decade for adaptation actions” (McElwee 2017, p. 224). The government has mobilized about two thirds of climate change funding from its own resources, while Official Development Assistance (ODA) represents around 30%. Most of ODA funding is in the form of loans for investment. For instance, the Vietnamese government expects to receive more than 94% of the funding required for implementing the National Strategy on Climate Change (NSCC) and the National Target Program to Respond to Climate Change and on Green Growth (NTPRCC-GG) from an ODA source [37]. Adaptation counts for a major part of the climate change budget: for example, the National Action Plan on Climate Change stipulated ten target programs for 2013 to 2015, with only one out of the ten related to GHG mitigation.

The most important financing mechanism to receive climate change related ODA funding is the SPRCC, the Support Program to Respond to Climate Change. This program was created specifically to mobilize funding to implement major national policies and programs. During the first phase (2009–2015), the SPRCC program raised nearly USD 1 billion in ODA support from bilateral and multilateral international donors such as the Japan International Cooperation Agency (JICA), the French Agency for Development (AFD), the Canadian International Development Agency (CIDA), and the World Bank, and expects to raise up to USD 1.2 billion for the second phase (2016–2025) [38]. International financial support to SPRCC is directed to the central budget before being distributed to climate change projects led by national ministries and provinces. In most projects funded by SPRCC at the local level, there is often some contribution from the provincial government in the form of a counterpart fund. The central government generally adjoins its own resources to international funding. Figure 1 describes the process for the allocation of adaptation funds.

Provinces and national ministries submit their proposals once a year to MoNRE, which reviews, evaluates, and selects prioritized projects with the support and guidance of the National Committee on Climate Change. Proposals developed by provinces and ministries need to be consistent with the list of prioritized actions identified in national policies (such as the NTPRCC-GG, National Strategy on Climate Change, the plan for the implementation of the Paris Agreement, and the SPRCC). Then, MoNRE submits the list of selected projects to the Ministry of Planning and Investment (MPI) and the Ministry of Finance (MoF) for review. The MPI allocates funding for selected projects from the national budget, and then the MoF disburses the approved funding to provinces and ministries. A similar process is applied at the provincial level, where the district government and provincial departments submit their proposals annually to DoNRE, which collaborates with the Department of Planning and Investment and the Department of Finance to review, select, and allocate funding (see Figure 1).

The main difference is that there is no adaptation funding from bilateral and multilateral organizations transferred directly to the provincial government.

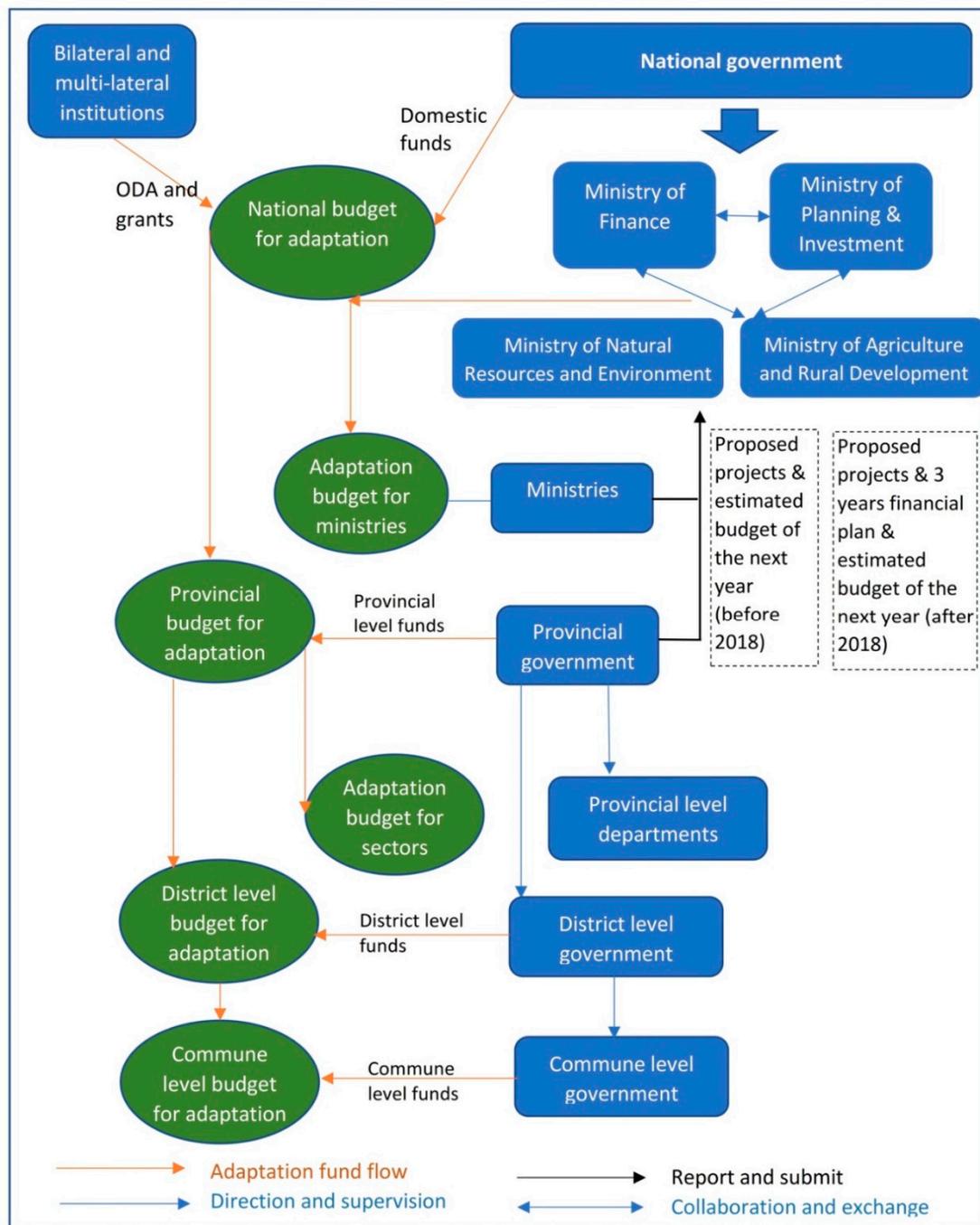


Figure 1. Formal adaptation financial flow.

3.2.2. Commune Level

As beneficiaries or local collaborators of adaptation actions decided at higher levels of government or by non-governmental organizations, the commune level People’s Committees are the main bodies for organizing the allocation and distribution of financial resources, even if they don’t directly receive these funds. However, at the commune level, no specific structure or staff are dedicated to climate change adaptation. Meanwhile, an organized system and regular funding for disaster risk reduction has been in place for decades (see in Figure 2 the Steering Committee for Natural Disaster Prevention

and Control). Therefore, in practice, when an adaptation project takes place, disaster risk reduction actors and systems are often involved either as collaborators or implementing agency in projects supported by external funds. However, it is important to note that, although disaster risk reduction actions and climate change adaptation are closely related, they are nonetheless different. In practice, the first often focus on emergency, recovery, and short-term responses to natural hazards, rather than medium- and longer-term activities that are informed by future climate change and its uncertainties.

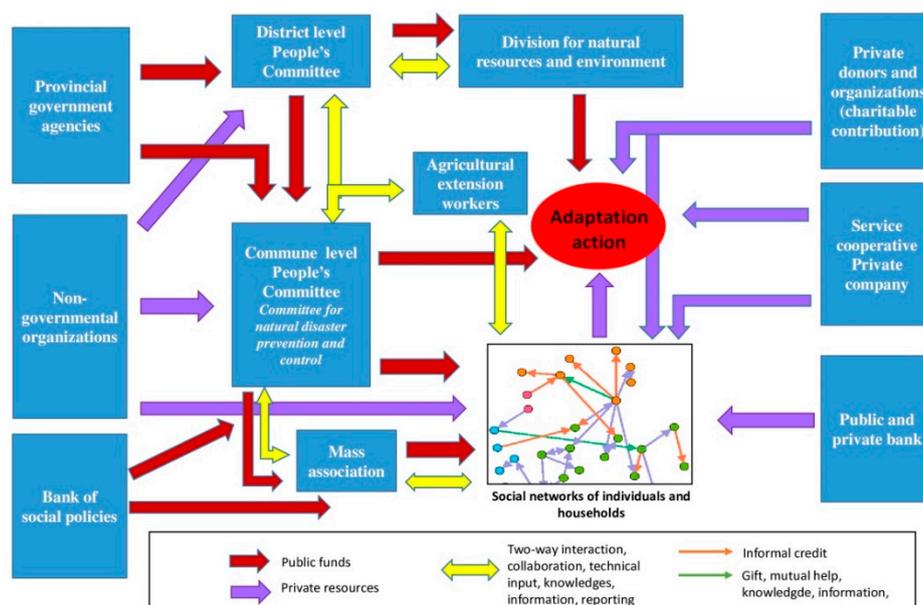


Figure 2. Adaptation resources flow at the local level.

In rural areas, among commune level government officials, the agricultural extension workers often play an important indirect role in the process of allocating adaptation-related funding and resources. While they do not directly manage financial resources dedicated to adaptation, they act as an intermediary between the State, agronomic innovation units, and the farmers (see Figure 2); thus, they can be an important conduit for the flow of information, knowledge, techniques, and agricultural inputs (seeds, fertilizer, crop protection products, etc.) that help improve agricultural practices in the face of climate change impacts [30,39]. Our study in Lao Cai also confirms that the agricultural extension workers collect agronomic data and identify problems that local farmers are facing. This information, disseminated to the higher-level authorities or non-governmental agencies, can then be used to design and fund adaptation actions.

The resources for disaster risk reduction and adaptation to climate change do not circulate only through the State channels. Private organizations such as companies, cooperatives, government officials, and even individuals also play a role (see Figure 2). For example, the practice of making “charitable contributions” (*từ thiện*) to areas affected by natural disasters is widespread and even systematic when the damage is severe. Civil servants are also often “forced” contributors. Sometimes a fee is directly deducted from their salary as a “voluntary contribution”. The financial contributions from private actors are not negligible, as they complement (the lack of) public funds. For instance, the “new service cooperatives” (*hợp tác xã dịch vụ*), which operate as private enterprises but with a different legal status, including privileged State support, can be important sources of funding for climate change adaptation at the local level [36].

4. Results

4.1. The Use and Allocation of Adaptation Funding

4.1.1. Infrastructure Bias

It is very challenging to quantitatively assess the yearly amount and use of adaptation funding based on the existing sources in Vietnam. However, results of the interviews with government officials and of the review of government documents indicate that a major part of adaptation funding has been allocated to protection infrastructures such as dykes, dams, and concrete drainage systems. The dominance of hard structural measures is recognized by the government and clearly mentioned in the national Plan for the Implementation of the Paris Agreement [38]. According to a study of climate change related expenditures in five important ministries (i.e., MoNRE, MARD, MOC, Ministry of Transportation (MOT), and Ministry of Industry and Trade (MOIT)), 88% of the central government funding allocated to climate change response was used for large scale infrastructure projects managed by MARD and MOT [1]. At the same time, other soft measures such as green infrastructures, soft river embankment, improving planning processes and practices, and solutions to address social and institutional drivers of vulnerability are marginal. A recent story in a central region province of Vietnam [40] is a relevant example. The local government plans to destroy existing plants, trees, and ecosystems along the local river and replace them with a concrete embankment to control the erosion problem. However, according to local communities, river erosion has been controlled for many years thanks to these trees and plants that have also protected people living behind them from flooding [40]. Building a new concrete embankment will allow the local government to extend the urbanized area, but it might also disrupt the ecological system that was in place, and in the case of a major flood, it may even place local communities at a higher risk.

The dominance of infrastructure can be to a great extent explained by the way adaptation is defined and interpreted by governmental agencies. Adaptation is officially defined as any adjustment in natural or human systems to reduce vulnerability to actual or anticipated climate change and to take advantage of beneficial opportunities [41]. Although this definition of adaptation is relatively broad and includes the concept of vulnerability, government officials often interpret the term from a physical perspective, which results in emphasizing the reduction of exposure to the impact of climate change. According to the national guidelines on development and the update of the Climate Adaptation Plans, climate change impact assessments are required, while there is no specific requirement for vulnerability assessment (the term vulnerability is not even mentioned).

Beyond this definition issue, the financial mechanism and the institutional framework of adaptation finance also plays an important role in shaping the nature of adaptation projects. As mentioned earlier, a significant part of financial resources for adaptation in Vietnam has come from ODA sources; thus, adaptation funds are mainly managed and allocated by the central government. As a result, adaptation actions are often influenced by the agenda set by the donors and national agencies, whose preference tends to be in favor of large-scale infrastructure projects, and thus lead to hard adaptation that focuses on exposure reduction and technical responses. In addition, provincial government political leaders seem also to favor this type of project. According to interviewed provincial level officials (anonymous interviewees, provincial officials from agencies in charge of climate change in Binh Dinh, March 2016 (via Skype), Can Tho, May 2019, and Lao Cai, August 2017), having large and costly infrastructure projects will improve the image of the area, which is thus perceived as more “modern”, as well as the local leaders’ image during their mandate, in particular because it contributes to a higher economic growth in the short term.

Adapting to the expected severe impacts of future climate change in Vietnam will certainly require major infrastructure investment as well as development dynamics shifts. However, infrastructure investments are also the riskiest kind, as they are prone to unexpected and irreversible social and

ecological impacts, potentially leading to maladaptation. As climate science tends to move fast, there is often no room to accommodate unexpected changes.

4.1.2. Funding Gap at the Local Level

At the provincial and lower levels, there is a major financial gap for adaptation. Provinces often lack funding for implementing their climate change action plans. The situation at the district and commune level is even more critical, as there are no or very limited financial resources for proper adaptation interventions at this level. Our interviews with provincial officials in Can Tho, Binh Dinh, and Lao Cai indicate that the local government often fails to implement these plans due to the lack of financial resources. Some even said that less than 10% of planned actions could be implemented. A government officer from Lao Cai province said that: “Our department has received very limited funding to work on climate change. We got some support from the central government to develop the action plan to respond to climate change. However, most of the actions identified in this plan have not been implemented due to the lack of funding...” (Anonymous interviewee senior official from DoNRE, Lao Cai, May 2018). The same story was recorded in Binh Dinh, Thua Thien Hue, and Can Tho. A senior former government official of Binh Dinh province shared that: “There is a huge funding gap for adaptation at the provincial level without talking about the district and commune level. I think the central and provincial authorities should find solutions to increase the funding for implementing provincial action plans on climate change. Otherwise, our actions will just stay on the paper.” (Anonymous interviewee, senior official from DoNRE, Binh Dinh province, March 2016).

The results of our study indicate several explanations for the lack of financial resources for adaptation at the local level. First, we found that climate change adaptation has not been fully integrated into the regular State budgeting process and regulations both at the national and local levels. As a result, it is difficult for provinces and ministries to allocate funding for projects that take into account climate change impacts. There is neither a clear definition of climate finance nor classification of climate change funds in the existing state budget regulations. According to some respondents in Can Tho city (anonymous interviewees, officials from agencies in charge of environment, climate change, social economic development planning and agriculture in Can Tho, 26 June 2019 and 17 June 2020), this is one of the reasons for the poor implementation of Resolution 120 on the sustainable development of the Mekong Delta adapting to climate change so far. This challenge and other financial barriers have been recently discussed during national level meetings, especially the national workshop to review the two years of implementation of the Resolution 120 organized in June 2019.

Second, it was reported that climate change response is often seen as a separate issue, under the responsibility of the natural resources and environment sector, and has been poorly integrated into the socio-economic and other sector development plans. For instance, the provincial climate change activities are mainly led by the Department of Natural Resources and Environment (DoNRE) with limited engagement of other provincial departments and lower level agencies. Many provincial government officials interviewed shared that most of the actions in the provincial action plans to respond to climate change are identified by DoNRE and the outside consulting institution selected to develop these plans within a short timeframe and without a careful analysis of how these actions are connected to the existing sectoral and development master plans of the province, and thus to the existing and potential funding sources. As a result, proposed adaptation actions in sectoral and provincial climate action plans often represent only a list of independent measures that are not fully in line with and integrated into sectoral and socio-economic development plans.

Finally, the institutional framework of adaptation financing tends to shape the nature of adaptation projects. As mentioned earlier, a large part of adaptation funding in Vietnam has been mainly managed and allocated by the central government. The relative lack of financial autonomy of provincial and lower level governmental actors [42] implies that many activities proposed in their province’s action plan to respond to climate change may not be implemented.

4.1.3. The Use of Adaptation Funding and Its Drivers at the Commune Level

At the local level, the institutional landscape of resource management dedicated to adaptation to disaster risk and climate change is embodied by women and men who are government officials, local authorities, cooperative directors, mass association leaders, but also individuals involved within networks of relationships and systems of social obligations. They thus occupy an ambivalent position, as they are both representatives of the central government or a company and fellow community members. This dual position and affiliation must not be neglected, as it influences the way resources are captured, used, and distributed locally. It can lead to misappropriation, as when local authorities give priority to distributing funds for local development projects to those close to them. However, it can also lead to actively defending the interests of villagers in front of the State bureaucracy. This is the case, for example, when they manage to connect villagers with a cooperative supported by a State fund to implement agricultural reconversion in order to cope with climate change.

These women and men often have to juggle between their professional and legal obligations on the one hand, and their social and moral obligations toward the villagers on the other, so that they often act as a fuse between the people and the higher authorities. When there are malfunctions, particularly in the allocation of resources or the management of a project, they are both criticized by the inhabitants and blamed by their superiors. In short, these people who locally embody State institutions and implement government-funded projects act as an intermediary between the State's agenda, the market opportunities, and the villagers' various interests. As a result, at the local level, they partly determine how resources for climate change adaptation and disaster risk reduction are actually used.

In parallel or in combination with the formal system, the "shadow system" [29], defined here as the set of interpersonal exchanges and arrangements occurring outside—but in connection with—the official institutions [30], constitutes an important source of funds and resources both in times of shocks and for long-term adaptation to climate change. Whether for accessing different types of assets or financial capital, for mobilizing the labor force needed to implement adaptation actions, or for getting information to access credit or grants, the networks of interpersonal relationships involving kinship, lineage, neighborhood, friendship, and clientelism can lever material and immaterial support for their members. In concrete terms, the local informal loan system, local rotating savings and credit groups, informal safety nets, as well as labor exchange practices, land arrangements, and the intense flow of gifts and mutual services allow people to access a wide range of resources directly mobilized to cope with and adapt to climate change [2,3,10,30,43–45]. We present in the Box 1 a case study conducted in Northern Vietnam's upland area, dealing with the responses and adaptation to weather-related disaster, to show a manifestation of these social dynamics that shape adaptation finance in rural Vietnam. It stresses that in Vietnam, interpersonal interactions, arrangements, and exchanges framed by both the logic of the debt and of the mutual help and regulated by strong moral and social obligation [10,45] are crucial channels for the circulation of resources dedicated to climate change adaptation.

4.2. *The Triple Dialectics of Adaptation Financing*

4.2.1. How Adaptation Finance Institutions Are Shaped by Dialectical Tensions

The web of actors of adaptation finance in Vietnam that we have described above has allowed us to draw a landscape that connects the official funding architecture to local actors' practices and adaptation actions that are actually implemented. However, this detailed picture cannot by itself help us assess the institutional readiness of Vietnam's adaptation finance. Indeed, the incentives and constraints of these actors, their time horizons, their financial resources and needs, and their political power play a major role in shaping and sometimes distorting the type of adaptation that is financed and then implemented in the end. In other words, we do not define institutional readiness as a somewhat abstract list of institutions that could be introduced indifferently in any country to improve adaptation financing circuits. On the contrary, institutional readiness must be assessed based on the existing funding institutions, both formal and informal, which shape and orient the nature of

adaptation actions. In this respect, there is seldom such a thing as pure climate adaptation finance, but rather a dynamic and evolving dialectic between actors' own main economic and social objectives and adaptation. This complex dialectic shows how ambiguous the drivers of adaptation can be and how the financing circuits can get lost or, on the contrary, appear in unexpected places.

Box 1. Local adaptation in the case-study location.

Case Study: Local Adaptation Following a Flashflood in a Tày Commune in Lao Cai Province

In October 2018, an unprecedented flashflood associated with a landslide devastated a part of a Tày commune located in Lao Cai rovince in Northwest Vietnam, home to 1200 households (5400 inhabitants). This "historical flood", as it has been locally qualified, has destroyed or damaged houses (49 houses), shops, roads, bridges, the irrigation system, gardens (20 ha), rice fields (61 ha) and culture (corn, trees, cassava) on the hillsides (88 ha), and fishponds (14 ha). The economic damages have been estimated at €750,000. Following this event, some recovery and adaptation initiatives were undertaken at the local level. Three of them will be presented here: reducing vulnerability through housing changes, building a concrete river embankment, and changing the cropping system.

In the commune, 38 households have moved their homes to a safer place (22 households) or rebuilt higher and stronger houses in the same location (16 households). Among them, 12 households had completely lost their houses, 9 had been deeply damaged, and 17 households had been flooded and felt vulnerable if such an event occurs again, so they chose to rebuild or strengthen their house. Five funding sources were used to finance this exposure reduction strategy: (1) the State support, ranging from €260 to €1500 per household; (2) the "voluntary contributions" from individuals and public or private organizations, ranging from €20 to €300; (3) bank loans (from €1800 to €3600); (4) funds from the market (extra-agricultural activities or other salaries, selling of agricultural products); and (5) resources from interpersonal relationship networks. We estimate that the latter contributed from 30% to 85% of the funds used to relocate or rebuild the houses.

These resources from the network came in various forms: monetary gifts, interest-free loans, material support (building materials, food for workers, etc.), credit when buying building materials, in-kind support (such as help for the construction work), informal loans with interest, ritual gifts (in money or in kind) during the inaugural celebration of the new houses, and land arrangements (such as gifts of exchanges of lands). Most of these supports involve a financial and moral debt. Hence, while the network of relationships with its obligations of mutual support allows receivers to obtain useful resources for adaptation, above all, it makes it possible to spread out expenses over the medium and long term. The mutual help system and the resources gained through the network of relationships are largely a matter of debt.

The second adaptation action following the flash flood was to strengthen the riverbanks to reduce the landslide risk that affect the plots beside the river and mitigate the flooding risks. This adaptation action is fully financed by the provincial government. Hence, if villagers are the ones who express their needs, which the local People's Committee and chairperson then relay up to the district and provincial levels, they are not involved in the implementation. For instance, during a meeting in a village where 105 m of embankment system was completed, a resident complained that the embankment structure was not long enough and did not reach his plots. The village chairperson and the village's Communist Party secretary immediately replied that the project was out of the scope of their duty and decision power and was under the responsibility of the upper-level authorities. This is a typical example of state-led top-down intervention, based on local needs, that focuses on reducing the impact of climatic hazards.

Finally, the third initiative concerned the conversion of rice fields into mulberry fields to raise silkworms. This sericulture project has been initiated and implemented by a cooperative that had mobilized private and state funds to provide inputs to farmers (mulberry seeds, fertilizer, and worms seeds) and training. Initially, this transformation of agrarian systems aimed to improve people's sources of income. However, it is also a way to adapt to climate change, as this type of farming is more resilient to flood risks. Thus, an economic development project following an environmental event has contributed to strengthen people's capacity to adapt to climatic hazards.

This case study of the various reactions following an historical flashflood illustrates the diversity of channels through which resources and funds for adaptation circulate, the complex social dynamics, exchanges, and arrangements that shape and allow the implementation of adaptation at the local level, and finally, how resources that are not necessarily or exclusively devoted to adaptation can nonetheless foster adaptation dynamics.

4.2.2. Three Dialectical Tensions to Overcome for Vietnam's Institutional Readiness

We thus evaluate the institutional readiness of Vietnam for adaptation finance through three of those dialectical tensions. First, adaptation financing channels can collide or be complementary to

development strategies, but development projects can also sometimes be adjusted so that they look like adaptation and attract specific financing sources. This first dialectical tension between development and adaptation is essential in Vietnam in particular, as the Ministry of Planning and Investment and the Ministry of Finance have the upper hand on socio-economic development plans, attracting and managing ODA funds (MPI), and finance management and budget allocation (MOF), respectively, while the Ministry of Natural Resources and Environment manages the adaptation plans without having the full control of adaptation funding. At the same time, most bilateral and multilateral institutions are incentivized to offer adaptation-labelled investments. While a tension between the need for development and the necessity to foster climate adaptation is obviously a concern for most developing countries, the case of Vietnam is particularly critical, as its most vulnerable areas are also the ones where the bulk of its investments occur and where economic growth and development policies are the highest, such as the Mekong delta.

Second, adaptation often occurs as a reaction to some specific events, in particular hazard and disaster [46], which are more or less connected to climate change. In short, on the field, people react rather than adapt, even if the first can lead to the second. This has two consequences. First, adaptation can come from an event, which is disconnected from climate change and thus is financed by non-adaptation-labeled financing sources. Second, even if the reaction is related to climatic events, they are not intentionally done as adaptation, and can thus be motivated and driven by factors independent from climate change. Here again, many resources not dedicated to adaptation can be used. However, as these reactions are not explicitly designed as adaptation interventions, they can foster adaptation but could also lead to some forms of maladaptation. Again, this kind of tension between reaction and adaptation is certainly not specific to Vietnam, but it also takes specific institutional forms in Vietnam, especially through the local management of adaptation actions by the Steering Committee for Natural Disaster Prevention and Control.

Finally, adaptation is often presented under the exogenous versus endogenous categories. In the first case, an external initiative fosters actions that reduce vulnerability, improve capacity and understanding, and change the behavior of local people who do not always have the climate constraint in mind. In contrast, endogenous adaptation is applied when local communities implement climate change adaptation activities by themselves. The results of our field study indicate that this theoretical dichotomy rarely occurs in reality, and that internal and external adaptation actions, and their financing circuits, are always mixed up. In this perspective, we will follow Malik, Qin, and Smith's [47] approach considering the modes of adaptation as a continuum: "At one end is the 'pure' spontaneous adaptation by private agents; on the other end is the pure planned adaptation by government (. . .). Between these extremes there are plenty of forms of adaptation that involve both the private agent and the government" (Malik et al., 2010, p. 5). In our opinion, one possible criterion for locating the type of adaptation within this continuum is the degree of internal and external input and resources that people mobilize to develop their adaptive strategy. Vietnam offers a striking example of the variety of local forms of adaptation financing and a specific case of entanglement of endogenous and exogenous resources, probably in large part because of its specific type of socialist market economy, which blends private and public initiatives.

5. Discussion

5.1. *Development or Adaptation Finance?*

The linkages between adaptation and development have been widely discussed in the literature over the last decades (e.g., [48–53]). Ayers and Dodman [48] identified three types of adaptation–development connections, including "stand-alone adaptation", "adaptation plus development", and "adaptation as development". While we agree with the authors about these categories, our findings indicate that another type of linkage exists, namely "adaptation minus

development”, where actions designed as adaptation projects may increase vulnerability and create new risk or exacerbate existing risk for development goals, especially in the long-term.

For instance, as reported in the result section, a large part of the adaptation funding has been allocated to major infrastructures. Although these infrastructures may be necessary for short-term development objectives and critical to tackle future climate changes, their design and building process may contribute scarcely to adaptation [1] or sometimes bear the risk of maladaptation [54]. A study conducted in Quy Nhon city revealed that some new and upgraded roads and dykes have contributed to making flooding worse for the city during the historical flood in 2009 [55]. Such infrastructures may modify the usual dynamics of hazards, and their existence may induce a feeling of protection among the population and result in an increased exposure combined with less preparedness when a major hazard occurs (such as centennial floods).

Moreover, the planning of climate related infrastructure often does not take into account uncertainty related to climate change, or only uses a single future climate change scenario [56,57]. Given the non-stationary nature of future climate change uncertainty [58], such a unique scenario approach is no longer appropriate [59,60]. The other problem is the lock-in effect associated with large scale and rigid infrastructures that often last for decades and may cause substantial losses when extreme events are more frequent and stronger than the protection level [59]. This situation limits the scope for future adaptation [56,61] and even reduces the ability of Vietnam to effectively adapt to future climate change [62], as the option value of a different climate scenario is no longer available.

The results of our study also indicate the lack of soft adaptation measures and of actions aiming at addressing the social, cultural, economic, and institutional drivers of vulnerability. These actions can be classified in the “stand-alone adaptation”, “adaptation plus development” in Ayers and Dodman’s categories [48]. This finding is consistent with other adaptation studies in Vietnam that highlight the limited attention paid to soft measures, especially at the provincial and lower levels [56], and to improve the local adaptive capacities [63]. Mc Elwee [36] argues that, in Vietnam, those capacities are closely linked to the access to social capital, collective action, common lands, institutional support, and government safety nets.

While “in many cases, current economic growth trumps future climate risks” (McElwee 2017, p. 228) [36], development goals and adaptation to climate change can sometimes proceed together. The case of the sericulture project implemented in the commune described in Box 1 is a good example. The first and main objective, for the cooperative that had designed the project, the district and municipal authorities that have fostered the project, and for local Tày people who have adopted the project, was to generate new income and improve their livelihoods. However, simultaneously, this project has been implemented to respond to the historical flashflood that destroyed the rice fields and irrigation system. More broadly, according to the director of the cooperative, the idea to develop sericulture has been motivated by climate change adaptation: this mode of culture, resistant to climate variation, is efficient at coping with flood and drought. However, while in this case adaptation to climate change and economic development process feed off each other, it is a localized dynamic that contrasts with the more commonly observed structural contradiction between climate change adaptation priorities and government-led development strategies [64,65]. Indeed, our findings indicate a specific mismatch between development and adaptation on the financial aspect. As reported in the results section, climate change is often considered as a separate issue and mainly managed by MoNRE and DoNRE. Consequently, climate change adaptation has been poorly integrated into socio-economic and development planning [65]. Therefore, existing funding for development cannot easily be used for climate and disaster risk-informed development. Compartmentalization of services and weak inter-sectoral coordination exacerbate the situation. In short, the structural organization of climate change adaptation finance largely explains the difficult combination of adaptation and development. Climate change adaptation is not (yet) mainstreamed into development policies.

5.2. Reaction or Adaptation?

While structural lock-ins in the allocation of funds to support soft and no-regret adaptation practices at the local level exist, evidence from our fieldwork nevertheless indicates that resources dedicated to other goals and coming from other channels than official adaptation funding can be mobilized to foster adaptation. This is the case when adaptation finance comes as a simple reaction to a factor that might be independent from or indirectly connected to climate change. In order to grasp these processes, it is necessary to identify the bundle of factors that frame adaptation practices on the ground.

In the previously mentioned case of a commune in Vietnam's northern upland (see Box 1), following a destructive flashflood in 2018, some inhabitants converted their rice fields into mulberry trees for silkworm breeding. This change in farming systems can be considered an adaptation measure, as it reduces vulnerability to future climate variation, and, to follow the IPCC's definition of adaptation, it makes it possible to "exploit beneficial opportunities" [66]. However, it is important to note that the decision to shift the livelihood model was influenced by many factors that are independent from climate adaptation. For many households, the change was foremost a response to a natural hazard that made their rice fields unusable, and for all the villagers, whether their rice paddies were destroyed or not, an economic motivation was prevalent, independent of flooding and future climate risks. The climatic hazard constitutes a "driving cause", which initiates the change, and the economic motivation a "final cause" (for which the change takes place). Additionally, apart from these two major causes, a more diffuse set of factors, which relate to land tenure, networks of relationships, the socio-economic logic of households, their socio-demographic profile, and the local authorities' actions, shape the decision-making process and the capacity to adapt.

Therefore, climate change is rarely the exclusive motivation to actions that are part of an adaptation effort. Instead, adaptation practices are often embedded in a broader context that must be taken into account to grasp the factual issues at stake [39]. The array of factors connected or not to climate change adaptation are useful indicators to be explored in order to identify which funding could be used in the field to foster adaptation and how non-adaptation-labeled resources are often mobilized. Indeed, as is often the case in Vietnam, the reaction/adaptation described in the case study has been possible thanks to a mix of material and immaterial resources from the State (financial, human, and technical support), the sericulture cooperative (input and training and funds from the sericulture cooperative), farmers' resources (land, labor, and money) and from the market (supply and outlet). These entangled channels are essential to the occurrence of climate adaptation in Vietnam; hence, they must be considered within the frame of readiness for climate adaptation. It emphasizes how internal and external resources not directly dedicated to adaptation are intertwined to finance adaptation practices.

5.3. The Continuum between Exogenous and Endogenous Adaptation

In Vietnam, while resources from the State or international organizations occupy a prominent position in adaptation funding, as we have shown above, the use of local resources that directly or indirectly finance adaptation practices is also an important factor to consider. As opposed to adaptation actions initiated, organized, and financed by entities external to local populations (such as State, NGOs, international organizations, donor agencies, private companies, etc.), "endogenous adaptation" are less visible in studies on climate change in Vietnam. They are also less promoted by public policies that favor top-down bureaucratic measures, often technical and "heavy" (McElwee, 2017) [36]. Endogenous adaptations can be understood as "(...) deliberate adaptation actions undertaken by individuals or small social groups that are specific to and occur within a local system, where human populations are ultimately affected" (Howard and Pecl 2019, p. 1392) [67]. Despite their lack of visibility, endogenous adaptation practices are actually frequent and widespread and constitute decisive dynamics of adaptation trajectories at the local level. They can be critical in the adaptation process and Dasgupta and colleagues [68] state: "public decision making for adaptation can be strengthened by understanding the decision making of rural people in context, and in particular

considering examples of autonomous adaptation and the interplay between informal and formal institutions” (Dasgupta et al., 2014, p. 638).

Endogenous adaptations frequently observed in the Vietnamese agricultural sector include experimenting new crops; changing the cropping pattern to a climate-change-suited cropping system (shifting away from vulnerable systems such as rice to hardier plants like cassava); adjusting planting time (changing cropping calendars and delaying planting or harvesting earlier), among others [36,39,69]. While all of these responses can be qualified as endogenous, in the sense that they are all community- or individual-level adaptation actions that are specific to and occur within a local system, they do not mobilize only local knowledge and resources. As we have shown, it is common that government, public extension services, private companies, NGOs, or new “service cooperatives” (*hợp tác xã dịch vụ*) are involved by providing incentives, recommendations, local training sessions, information, advice, knowledge, technical support, and inputs. The market forces also create opportunities for farmers to adapt. In other words, these internal and local changes that foster adaptation are often supported or framed by external agents.

That is why, rather than opposing endogenous and exogenous adaptations, we argue that the social reality in Vietnam illustrates their entanglement. The literature generally distinguishes between “autonomous adaptations” (sometimes called “spontaneous adaptations”), which are initiated by populations in response to a climatic stimulus but not necessarily designed to adapt to climate change, and “planned adaptations”, which are deliberately orchestrated by the State and its local bodies [67,70]. The characteristic of what Howard and Pecl [67] call “autochthonous adaptation” is more accurate and appropriate for describing the endogenous adaptation concept. It combines four fundamental dimensions: “(1) it is deliberate; (2) it refers to individuals and small groups of individuals; (3) it is specific to the locality—specific environmental, social, and cultural conditions that prevail in specific places where people live and act and (4) it occurs within a local system, which is affected by multi-scalar drivers and feedbacks—thus, it is not independent of ‘external inputs’” (Howard and Pecl 2019, p. 1392).

The value of this definition is that it enables to precisely identify the core characteristics of an endogenous adaptation action without isolating this action from broader existing social, political, cultural, and market dynamics and thus by considering the intertwining of internal and external resources. Indeed, in the field, the line between endogenous and exogenous adaptation is often blurry, especially in the Vietnamese context where the bureaucratic apparatus, which is present at all levels, ensures a diffuse local presence. Thus, for example, the farming innovations initiated and carried out by peasants that we mentioned above are often framed, facilitated, or disseminated by the “peasants’ association” or the “women’s association”, which are “mass organizations”, originating from the communist party, embedded in an administrative structure linking the base to the top, but locally managed by the inhabitants. Another frequent case of entanglement of local and external resources concerns the adaptive practices consisting in diversifying rural livelihoods and income, which is one of the main endogenous adaptation strategy in Vietnam: “the effectiveness of livelihood diversification as an autonomous adaptation approach will depend on the external supports offered by broader market mechanisms (e.g., labor or produce markets) or from the national government’s policy and planning support mechanisms” (Rahman and Hickey 2019) [71].

In a typological perspective, we can distinguish in Table 1 different forms of reactions and practices of adaptations. The distinction is based on the respective share of internal and external inputs, which is addressed through four parameters: who initiates, who designs, who finances, and who implements.

These distinctions are ideal type and should not hide the complexity of the social reality. The methodological challenge is to measure the respective degree of internal and external resources for each adaptation case in order to define the nature of the adaptation (more or less endogenous or exogenous). Moreover, while it is not relevant to oppose exogenous and endogenous adaptation, it is still essential to focus on the local initiatives and to document the various resources, inputs, and assets mobilized by the populations, because according to Rahman and Hickey [71] “learning from

and promoting these ‘grassroots’ innovations has the potential to avoid government policy-driven maladaptation.” We argue that, at the local level in Vietnam, interpersonal interactions, arrangements, and exchanges framed by both the logic of debt and of mutual help and regulated by strong moral and social obligation [10,45] are crucial channels for the circulation of resources dedicated to climate change adaptation.

Table 1. The continuum between endogenous and exogenous adaptation.

Type of Adaptation	Initiated by	Designed by	Financed by	Implemented by	Examples	
Exogenous adaptation project	external actors	external actors	external resources	external actors	“Urban Environment and Climate Change Adaptation Project” of Asian Bank for Development *	
Community-based adaptation project with a participatory process	external actors	external actors based on local dynamics and knowledges	external resources	local actors with support of external actors	“UNDP’s Community-Based Adaptation program In Vietnam” **	
External adaptation project locally appropriated	external actors	external actors	external & internal resources	local actors	The sericulture project in Lao Cai (see case study box)	
Endogenous adaptation followed and reinforce by external actors	local actors	local actors	internal & external resources	local actors	Flood management and adaptation policies in Dong Thap and An Giang provinces, and Can Tho city (Thong Anh Tran and Romina Rodela 2019)	
Endogenous adaptation	local actors	local actors	local actors	local actors	Customary rights, local knowledge and practices related to “sacred forests” of Dao groups in northwestern Vietnam (Tran Huu Son 2014)	

Source: * <https://www.adb.org/projects/43237-013/main#project-pds>; ** <https://www.adaptation-undp.org/projects/spa-community-based-adaptation-project>.

6. Conclusions

This article has presented the complex landscape of adaptation finance in Vietnam and analyzed the way resources for adaptation circulate in the specific case of the Vietnamese economy between formal and informal institutions. The general architecture and the rationale of adaptation finance deeply shapes adaptation practices in the field. In this sense, there is no general rule or framework to define a country’s institutional readiness for adaptation finance. The country-specific analysis of the complex financing sources for adaptation finance explains some of the tensions and complementarities arising with respect to the diverse goals of the adaptation projects.

In the case of Vietnam, three of those tensions have arisen as key factors, namely, the precarious balance between development goals and climate adaptation necessity; the blurry line between reaction to climate-related hazards and adaptation to climate change; and the entanglement of internal and external resources used for local adaptations. These tensions dynamically define how Vietnamese and international institutions may move toward better adaptation financing circuits.

In a context where limited funds reach the local level or are dedicated to local adaptations and where national development planning still tends to override environmental considerations, State actors in charge of different sectors of activity at province, district, or commune level still consider adaptation as only the responsibility of MoNRE and their line agency at the provincial level. Rarely do the different entities coordinate to pool their different resources and combine development actions with those dedicated to adaptation. The issue, then, is not only the lack of funding, although it remains

important, but rather the way in which resources from different channels are allocated and used to serve, among other things, adaptation dynamics [8].

However, this situation should not hide the existence of actions that result in adaptation to climate change, whether intentional or unintentional, but for which the resources mobilized come from a wide range of channels, far exceeding those dedicated to adaptation finance. Thus, at the local level, dynamics that lead to adaptation are financed by various resources provided by the private sector, households and their networks of relations, and the State through local authorities and many mixed entities between the State and civil society. Under these conditions, while more attention needs to be paid to endogenous adaptations and the material and immaterial resources available within the communities, it is not possible and not efficient to separate endogenous from exogenous adaptations. Depending on each case, a different share of internal and external input shapes adaptations on the ground, and it might be more efficient to measure in each case which resources coming from which sources should be used for which kind of adaptation. Here again, however, the finance of adaptation, associated with other purposes, determines the forms of adaptation.

From that institutional analysis of adaptation funding in Vietnam, it is tempting to try to draw key take away messages for a prospective analysis of adaptation funding. First, monitoring, reporting, and verifying should be placed at the core of Vietnam's adaptation assessment strategy. Without good statistical information, it remains difficult to assess the state and dynamics of adaptation finance, as we have to rely on scattered and often inconsistent data. That said, it appears that the architecture of adaptation financing and the logic of the main actors who manage and allocate resources leads to a preference for capital intensive projects. As a result, existing policies and guidelines put sometimes too much emphasis on the reduction of exposure by promoting the impact assessment approach, while putting the reduction of vulnerability and adaptive capacity as secondary objectives. Social and economic vulnerabilities may well determine the greater part of the adaptation capacity of the country. It is thus very important to build adaptation strategies in a decentralized way that includes key stakeholders and the general public in order to build prospective scenarios of action. Reducing the exposure will still be essential in many respects for Vietnam, but the challenge will be to build no-regret infrastructures that will be fit for different sets of climate scenarios. In that sense, the dialectics between adaptation and development could evolve differently than today, or even be simply out of date. By putting more emphasis on nature-based solutions and lowering the potential climate impacts on new general infrastructure, development will simply take a newer productive content than the maximum investment.

This leads us to a second take-away for a prospective assessment of adaptation funding. National guidelines tend to promote the use of a single future climate change scenario for adaptation planning, which may lead to a perception that future climate is predictable and that adaptation is simply a technical problem. These limitations may partly explain the current dominance of grey, inflexible, large-scale infrastructures as adaptation actions that aim to reduce exposure and control natural hazards. Pure optimization strategies may be inefficient in a world defined by "Green Swans" (Bolton et al., 2020) [72] and multiple sources of uncertainties. Robust decision making to tackle the heavy-tailed probabilities becomes central. This should rebalance part of the adaptation effort into soft, non- or low-regret adaptive solutions and measures to address the fundamental drivers of vulnerability and to increase adaptive capacity. The alternative would be to be stuck in reactive rather than adaptive policies.

The third key takeaway is certainly that most of these soft options would at least partly come from the local level. Here, the lack of financial resources, machinery and technical equipment, and knowledge and sound weather information are the main problems. In this paper, we have suggested different ways in which exogenous financing from the central government, NGOs, or bilateral and multilateral institutions might blend with local funding, initiatives, or knowledge in order to increase the weight of local adaptation solutions.

Future research directions may include expanding the comparative approach to institutional readiness with countries for which we could find institutional similarities with Vietnam. Indeed,

as we reject the possibility of a generic template for assessing institutional readiness, we still consider that institutional intercomparisons, if carefully assessed, may provide relevant information for policy-oriented recommendations. It is also clear that this assessment of the current state of institutional readiness has to be integrated into prospective scenarios of climate change and adaptation options. This is a second avenue for further research. Finally, the quantification of adaptation financing flows remains a core difficulty in the kind of mapping that we have undertaken. This data collection should be seen as a priority of applied research collaborations on the topic in Vietnam and should apply to financing sources that are not necessarily ear-marked as adaptation but still improve adaptation.

Adaptation funding will be a key issue for Vietnam in the next decades as climate change worsens. The landscape of adaptation finance today gives us insights into the types of adaptation projects that may be financed, which bear some risks. Adaptation policies will have to overcome the triple dialectics of adaptation finance in order to fully respond to the climate challenge.

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