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SCALING UP LOCALLY-LED CLIMATE ACTION IN CAMBODIA

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Abbreviations

ASPIRE	Agriculture Service Program for an Inclusive Rural Economy
CDIDC	Climate Change and Disaster Response and Serious Infectious Diseases Committee
CDP	Commune/sangkat development plam
CIF	Commune/sangkat investment fund
CIP	Commune/sangkat investment plan
CS	commune/sangkat
GCF	Green Climate Fund
GEF	Global Environment Facility
LoCAL	Local Climate Adaptive Living Facility
LGCC	Local Governments and Climate Change
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MoE	Ministry of Environment
MME	Ministry of Mines and Energy
MOI	Ministry of Interior
MOWRAM	Ministry of Water Resources and Meteorology
MPWT	Ministry of Public Works and Transport
MRD	Ministry of Rural Development
NCDD	National Committee for Sub-National Democratic Development
NCDD-S	National Committee for Sub-National Democratic Development Secretariat
NCDS	National Council for Sustainable Development
NDC	Nationally Determined Contribution
NGO	nongovernmental organization
NP-2	National Program on Sub-National Democratic Development Phase 2
PBCRG	performance-based climate resilience grant
RGC	Royal Government of Cambodia
SRELFOOD	Food security and community-based recovery support to flood-affected communities in Cambodia
SNA	subnational administration
SRL	Reducing the vulnerability of Cambodian rural livelihoods through enhanced sub-national climate change planning and execution of priority actions
UNDP	United Nations Development Programme
VRA	Vulnerability Reduction Assessment

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Executive Summary

Cambodia has recorded impressive economic growth and improvements in social well-being in the last two decades, and it aspires to become an upper-middle income country by 2030 and a high-income country 2050. However, this progress is threatened by climate change. If appropriate and risk-informed adaptation actions are not taken, Cambodia's gross domestic product (GDP) may fall 9.4 percent by 2050 and crop yields could fall 30 percent under a high emissions scenario (WBG 2023a). Drought and unpredictable monsoon seasons may cause a 6 percent increase in Cambodia's poverty rate within this decade. The burden of climate impacts in Cambodia is likely to fall disproportionately on poor households and marginalized groups because they tend to be more reliant on climate-sensitive livelihoods such as agriculture and fisheries; live in climate vulnerable areas; and have their adaptive capacity substantially stretched by more frequent extreme weather events and disasters. Therefore, systematic and sustained action to address climate change impacts is essential to sustaining Cambodia's prosperity and resilience.

Addressing climate impacts must take place at multiple levels, including the local level, in which communities and local governments are on the frontlines for action. The Royal Government of Cambodia (RGC) has implemented the first phase of a decentralization and deconcentration (D&D) reform program known as the first phase of the national program on subnational democratic development 2010-2020 (NP1) that shifted some service delivery to subnational administrations. It established decentralized systems for local development planning and financing, such as through a commune investment program (CIP). This mechanism can bring resilience planning into local development, influence awareness and behavioral change within communities, and contribute to the country's mitigation and adaptation goals. The RGC has recognized this - In the second phase of D&D efforts outlined in the National Program on subnational democratic development 2021-2030 (NP2), the government aims to scale up efforts to build resilience to climate change and disasters into public service delivery and local development interventions and enable the subnational administrations to effectively address climate change vulnerabilities, disasters, and serious infectious diseases.

The report aims to inform policy makers, national, and subnational government actors, the World Bank task teams and development partners on entry points and recommendations to scale up locally led climate actions in Cambodia. The report maps out the government's key regulatory frameworks, policy priorities, and institutional arrangements that could deliver climate finance and accelerate climate action at the local level. It also captures lessons learned from initiatives in Cambodia to integrate climate risks into local development investments and incentivize climate action. Lastly, the report highlights best practices that could be considered in future local climate-smart investments.

The finding and recommendations of this report is based on primary and secondary data, including (a) a literature review of Cambodian policy and climate change-related program documents; (b) an assessment of 837 climate-smart investments at the commune level in Cambodia; (c) a review of 24 community-based climate action project evaluations in Asia (including eight in Cambodia) to identify best practices; and (d) interviews with national and subnational government officials and stakeholders and focus group discussions

with community members conducted in five communes in Battambang and Siem Reap provinces. In total, 167 community members, government administrators, and other stakeholders were consulted over the course of this study. Key findings are described below.

Community and local development activities identified in commune investment plans (CIPs) will continue to be key entry points for locally led climate action in Cambodia. As stated in RGC's Climate Change Strategic Plan, RGC prefers to channel funds for climate change through direct budget support using national systems and procedures. The Commune/Sangkat Investment Fund is a powerful platform for delivering climate finance while addressing local development needs. The RGC has made incremental fiscal transfer over the years to the communes/sangkats in the last decade that reached on average US$127,000 per commune/sangkat in 2022. However, the fiscal transfer mechanism has not been fully optimized to promote climate resilient local development. To date, on average, less than 1 percent of commune/sangkat budgets are spent on natural resources management and climate change related investments, even though commune development planning templates include "natural resources and environment" as one of five priority areas for local government investment.

There remains a substantial capacity and financial gap amongst communes/sangkats to integrate climate risks and resilience into local development plans and investments, which impedes risk-informed decision making and resource allocations. The report finds that communes/sangkats and communities face capacity constraints to integrate climate resilience into their local development planning. Furthermore, commune governments juggle many basic development priorities, and tackling climate change impacts has to date not been perceived as a top priority. About 57 percent of commune budgets in 2022 were spent on administrative costs and unplanned expenses, leaving 43 percent of budget for investments in development priorities, which is mostly invested in economic development needs, such as infrastructure. Therefore, enhancing the awareness of local governments and communities to understand the scope and scale of climate risks at their level, providing them with tools and processes to factor climate change adaptation into their planning and investment decision-making, mobilizing additional financial resources, and providing incentives to address climate risks systematically will be key for successful locally led climate action in Cambodia.

Cambodia has a decade of experience piloting an incentive mechanism for locally led climate action that could complement the Commune/Sangkat Fund (C/S Fund). This has been done primarily through the performance-based climate resilience grant (PBCRG) delivered at the commune/sangkat level supported by various international organizations. Climate funds provided by these organizations are delivered from the National Treasury directly to communes through C/S Fund. Such funds cover the additional costs of making investments climate resilient. Over a decade of pilot project implementation, subnational governments in Cambodia have now invested almost US$2,9 million of their own budget from the C/S Fund for climate priorities, which was complemented by PBCRG finance.

This incentive mechanism can be further strengthened and integrated into the country system to bring impacts to scale. The PBCRG modality establishes a parallel system for the flow of funds, which only funds the climate 'additionality' portion of the investment, separating out the extra costs that climate-proofing infrastructure brings. Maintaining a parallel system could constrain efforts to fully institutionalize the incentive mechanisms. Additionally, most climate investments supported by PBCRG have focused on building small-scale physical infrastructure, leaving scope for a broader range of investments in social capital and across diverse sectors such as health, livelihoods, or education. Only 5 percent of investments have been focused on training, raising awareness about climate change and disaster risk, and livelihood support. Furthermore, while PBCRG pilots have covered approximately 50 Districts in 12 Provinces, only a

small percentage of communes in each district benefitted from this finance. For sustainable and scalable impacts, the incentive mechanism and local climate solutions will need to be scaled up, systematically integrated into the government's system through CIP and C/S Funds, and they will require cross sectoral coordination combined with capacity support for the district and commune governments as well as communities.

Enhancing communities' social capital is crucial to complement physical infrastructure and help build more sustainable and longer-term resilience against climate shocks. Providing support to saving groups, such as World Bank's Livelihood Enhancement and Association of the Poor (LEAP) model of supporting saving groups, has enabled communities to improve household income, which in turn improves their adaptive capacity. In a similar vein, the skills development provided through the LEAP project have enabled farmers to diversify agricultural livelihoods by working in sectors that are less sensitive to climate shocks. Indeed, investing in socioeconomic aspects of resilience brings important benefits, such as creating platforms for information sharing, improved trust between members, and opportunities to improve household income. Furthermore, investments in institutional capacity to manage and maintain physical infrastructure are essential for sustainability.

Access to and effective use of climate change data and information is key to building local resilience. Local actors' ability to access and generate information on climate change impacts and solutions to address climate risks are prerequisites for awareness and informed planning and decision-making. To date, efforts to integrate climate change planning in subnational governments have been focused on managing current risks, rather than using climate change projections. While in many cases future risk will be an intensification of current disaster exposure, climate change will introduce novel risks like all-season wildfires, concurrent droughts, salinization of fields, new temperature extremes, and far-reaching storm surges, among others. For this reason, using climate projections and understanding how they could translate into impacts on livelihoods and other sectors is a critical component of effective local climate action. Enhancing public access to such data and information as well as making it comprehensible for these stakeholders will enable local governments and communities to use climate data, combined with local knowledge, to act.

Addressing climate impacts at the local level will need an integrated and multisectoral approach across the government levels. The report finds that the engagement of line ministries in initiatives related to local climate actions still needs to be strengthened. Enhancing multisectoral coordination and cooperation will not only strengthen the environmental sustainability outcomes and avoid maladaptation but also enable local communities and governments' access to the necessary sectoral resources and expertise. Doing so while reinforcing government linkages between the commune/sangkat level and the district and provinces can better enable climate action at multiple government levels and make investments more sustainable.

Some best practices of climate action at the local level across Asia can inform future local climate investments in Cambodia. Our analysis of 24 community-based climate action projects in Asia shows that an inclusive and participatory approach can help ensure that the investments meet the needs of local people and enhance their willingness to maintain investments in the long term. Further, designing interventions that are appropriate for the biophysical and agroecological context is an important element of successful local climate action. For example, targeting interventions both upstream and downstream of physical infrastructure, testing soil chemistry for suitability of improved rice varieties, analyzing the hydrology of mangrove forests before replanting forests, are vital for successful climate smart investments.

Recommendations

ACTION AREA	RECOMMENDATION	ACTORS
1. Strengthen local governance systems to integrate locally led climate action and capacity for climate resilient planning.	• Build the capacity of subnational administrations (SNAs) and communities to integrate climate risk assessment to inform local climate smart development. • Enhance communities' capacity to participate in commune development plan and budgeting process and institutionalize participatory and inclusive approaches in planning and monitoring. • Enhance digital governance, service delivery, and accountability in local climate actions.	National government, subnational government, development partners
2. Strengthen the country system to scale up financing and incentive mechanisms for locally led climate action.	• Integrate incentive mechanisms into C/S Fund mechanism. • Consider modifying current institutional set up to allocate funding at different levels of governance and coordinate between relevant stakeholders at subnational level. • Mobilize finance via public, multilateral, and private finance for sustaining and expanding incentive mechanisms for local climate action. • Enhance performance indicators to include measures that reflect climate risk assessment, use of climate data, inclusive planning and investments. • Consider grants at the district level that can combine climate action needs across two or more sangkat/communes, enabling investments that can operate at landscape level where common vulnerabilities are best addressed by investments across multiple communes. • Leverage local public private partnership in climate adaptation investment action.	National government, subnational government, private sectors, development partners
3. Improve public access to data and analysis on climate risks and vulnerability and adaptation resources and integrate local/ indigenous knowledge and practices in the planning process.	• Update and enhance the national climate vulnerability map and make it accessible to subnational administrations and communities to inform local development planning. • Complement climate change projection data with examples of clear, actionable information about the implications of these projections across livelihoods and geographies and potential adaptation measures. • Develop strategies to integrate indigenous/local knowledge and traditional practices into local climate action plans. Local knowledge can offer insights into sustainable land management, conservation practices, and resilience-building that are suited to local context. • Incorporate innovative technologies and data driven approaches (e.g., mobile application for community engagements, GIS for risk mapping and planning) to enhance climate actions efforts at the local level. • Develop regional digital hub to providing informative data for decision makers and citizens to enhance participation in planning process and prioritize potential investments.	National government, subnational government, and development partners

ACTION AREA	RECOMMENDATION	ACTORS
4. Improve quality and expand scope of local climate smart investments.	• Enhance the standard operational procedure and technical specifications of small-scale infrastructure investments to be climate resilient. • Integrate social and equity consideration when investing in infrastructure to ensure equitable distribution of benefits. • Expand investments to enhance socio-economic resilience, such as sustainable livelihood, skill development and vocational training, support for community enterprises and saving groups. • Incorporate innovative technologies and data-driven approaches to enhance climate action efforts at the local level, e.g., use of remote sensing for environmental monitoring, mobile applications for community engagement, and GIS for risk mapping and planning. • Improve access to climate resilient infrastructure experts and ensure that commune and sangkat councils can draw on expertise from line ministries at the subnational levels when necessary.	National government, subnational government, and development partners
5. Enhance sectoral coordination and collaboration to mainstream and support local climate resilient planning.	• Engage line ministries and draw on their technical expertise and support at the local level to inform CIP and PBCRG investments. This could be done by strengthening an existing national technical working group. • Ensure potential local climate smart investments are aligned with the national and sectoral climate change action plans and NDC.	National government agencies

CHAPTER 1.

Introduction: The Imperative of Local Climate Action in Cambodia

The need to accelerate climate action is urgent in Cambodia. Intensified climate impacts, such as drought and more unpredictable monsoon seasons, may cause a 6 percent increase in Cambodia's poverty rate within this decade—near double the impact COVID-19 had on the poverty rate in 2020 (WBG 2023a). The impacts of climate change will be felt across Cambodia, but a disproportionate share of these will fall on poor households that are exposed to flood, drought, and heat stress, particularly those that live along the Mekong, Tonle Sap, and the northwest of the country. In addition to exacerbating inequality, climate change will have profound impacts on infrastructure and services on which low-income households depend. More frequent floods and droughts increase the risk of damage to Cambodia's water supply infrastructure, health and education facilities, and road networks, disrupting access to vital services and markets. Coastal communities face the risk of a 19 cm sea level rise by mid-century, exacerbating salinization of their fields and water sources. Furthermore, Cambodia has experienced one of the world's most rapid rates of deforestation in the last two decades, leaving highland and wetland households to bear novel risks, including erosion, wildfires, and extreme flooding.

Cambodia's low-income households that are dependent on climate-sensitive sectors for their livelihoods will bear the largest burden of climate change impacts. More frequent floods and droughts are already generating negative impacts on people's food supply and livelihoods (Setyowati, Pichon, and Khan 2023). Climate change is projected to lower yields of rainfed rice by up to 30 percent by 2050, representing one of the most negative impacts from climate change on staple crops in the entire region. Water supply is currently insufficient to meet the challenges of climate change in the agriculture sector, and nearly 80 percent of existing irrigation schemes need to be rehabilitated (WBG 2023a). Climate extremes are projected to negatively affect Cambodia's fisheries, too, endangering food security in a country where most of the animal protein comes from fish. Climate change poses urgent challenges for Cambodia's water resource management, agriculture, fisheries, and the resilience of its basic infrastructure.

To address climate change and disaster challenges, Cambodia has made concerted efforts for climate mitigation and adaptation. In its Nationally Determined Contribution (NDC), Cambodia aims to cut greenhouse gas (GHG) emissions to 41.7 percent by 2030 (MoE 2020). Substantial climate mitigation efforts will come from the forestry and land use sectors, as they are the biggest contributors of GHG emissions (accounting for 49 percent of annual GHG emissions by 2030), followed by energy (22.2 percent), and agriculture (17.5 percent) (MoE 2020). Cambodia has developed a national adaptation strategy that includes enhancing cross-sectoral processes at multiple levels of the government to scale up climate change adaptation actions. The country has also adopted policies on disaster risk management.

Climate adaptation and mitigation actions must take place at multiple scales, especially at the local level. The impacts of climate change differ across Cambodia's regions, depending on geography, ecological conditions, and development patterns. When people are empowered to identify their vulnerabilities to climate change and needed solutions, they could develop more appropriate development interventions to address local climate impacts (Phadke, Manning, and Burlager 2015). At the local level, people are more likely to have reliable information about the immediate and long-term costs and benefits of actions (Ostrom 2009). In Cambodia, subnational administrations (SNAs) should be involved in climate action to improve developing planning at the local and regional scales, as climate change risks undermining development investments across all sectors.

Accelerating local climate actions will depend on the strength of institutions and active engagement of local communities and stakeholders. In Cambodia, the government has established decentralized systems for local development planning and financing, such as through commune investment plans (CIPs). This powerful mechanism can be used to address climate risks and bring resilience planning into local development, influencing awareness and behavioral change within communities, and contribute to the country's' mitigation and adaptation goals. Reinvigorating CIPs for local climate actions can also offer multifaceted benefit by strengthening cross sectoral linkage to address climate impacts. Cambodia has been the site of successive pilots and projects to bring climate finance to the local level, by granting finance through commune governments, line ministries, and nongovernment organizations (NGOs). With nearly a decade of experience to draw on, there is a unique opportunity to scale up the initiatives that build on existing efforts and strengthen local governance to address climate change impacts.

Leveraging resources and meaningful engagement of the local governments and communities in the adaptation efforts could bridge the adaptation gap in Cambodia. Cambodia Country Climate and Development Report/CCDR (World Bank, 2023) suggests that climate change is projected to lower GDP by up to 9.4 percent by 2050 and reduce agricultural yields (e.g. rice, maize, cassava). With adaptation measures, however, the impacts of climate change on GDP could reduce by 52-66 percent. Engaging the local government and communities could enable effective and well targeted resources allocation on adaptation measures.

Supporting local government to take climate action is aligned with global efforts to leverage locally led solutions for adaptation. Practitioners, researchers, and governments have signed onto eight principles on locally led climate adaptation to guide the design and implementation of locally led climate actions (see Box 1).[1] While these principles focus on adaptation, they could be applied in the local mitigation efforts. These principles are designed to give people more agency over designing climate solutions to ensure more sustainable and effective interventions (Soanes et al. 2021). Furthermore, there are emerging initiatives across the globe that integrate these principles into actions on the ground. For instance, the World Bank's locally led climate action (LLCA) aims to strengthen the government's systems and capacities for locally driven climate action and supports partnerships between governments, communities, and civil

[1] Global Commission on Adaptation, nd.

society to assess climate risks and identify socially inclusive solutions that are tailored to local needs and priorities. In Kenya, the Bank implements Financing Locally Led Climate Action (FLLoCA), a national scale model of devolved climate finance to channel resources to local level combined with capacity support for effective climate smart investments that tailor to local needs. In the context of Cambodia, working through C/S Fund has great potential for operationalizing principles of locally led climate actions with the principles for effective climate action, drawing on lessons from FLLoCA and other LLCA initiatives.

Against this backdrop, this report aims to identify opportunities to scale up and accelerate local climate action in Cambodia. It explores entry points within the existing institutional arrangements for decentralizing climate finance, accelerating local climate actions, and documenting some best practices. The methodology underpinning this report consists of (i) a literature review of Cambodian policy and climate change-related program documents; (ii) an assessment of 837 climate change investments at the local level in Cambodia; (iii) an analysis of 24 community-based climate action project evaluations in the region (including 8 in Cambodia) to identify best practices; and (iv) field work with subnational government officials and community members conducted across five communes in Battambang and Siem Reap provinces from August–November 2023. Focus group discussions and key informant interviews were held in communities where local governments used small grants to invest in community resilience and poverty reduction. Interviews were conducted with men and women, commune councilors, district-level administrators, and provincial administrators. The sample of communes were selected based on a spread of different climate-related investments.[2] In total, 167 community members, government administrators, and other stakeholders were consulted over the course of this study.

Box 1. Principles of locally led climate adaptation:

1. **Devolve decision making to the lowest appropriate level.** Giving local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritized, designed, and implemented; how progress is monitored; and how success is evaluated.
2. **Addressing structural inequalities faced by women, youth, disabled people, Indigenous peoples, and marginalized ethnic groups.** Integrating gender-based, economic, and political inequalities that are root causes of vulnerability into the core of adaptation action and encouraging vulnerable and marginalized individuals to meaningfully participate in and lead adaptation decisions.
3. **Provide patient and predictable funding that can be accessed easily.** Supporting long-term development of local governance processes, capacity, and institutions through simpler access modalities and longer term and more predictable funding horizons, to ensure that communities can effectively implement adaptation actions.
4. **Invest in local capabilities to leave an institutional legacy.** Improving the capabilities of local institutions to ensure they can understand climate risks and uncertainties, generate solutions and facilitate and manage adaptation initiatives over the long term without being dependent on project-based donor funding.
5. **Build a robust understanding of climate risk and uncertainty.** Informing adaptation decisions through a combination of local, indigenous, and scientific knowledge that can enable resilience under a range of future climate scenarios.

[2] Some of these investments in the sample relied on the performance-based climate resilience grant (PBCRG) modality supported by the United Nations Development Programme's SRL and the Asian Development Bank's Agriculture Service Program for an Inclusive Rural Economy program, as well as non-PBCRG investments from the World Bank's Livelihood Enhancement and Association of the Poor program and UN Women's EmPower program.

6. **Flexible programming and learning.** Enabling adaptive management to address the inherent uncertainty in adaptation, especially through robust monitoring and learning systems, flexible finance, and flexible programming.
7. **Ensure transparency and accountability.** Making processes of financing, designing, and delivering programs more transparent and accountable downward to local stakeholders.
8. **Collaborative action and investment.** Collaboration across sectors and levels of government to ensure that different initiatives support one another, and their activities avoid duplication, to enhance efficiencies and good practice.

The report is structured as follows: Section 2 describes the key laws, ministries, institutions, and progress of decentralization efforts over the last 12 years. This sets the scene for how climate finance can be channeled to the local level, while emphasizing the capacity-building needs that should be addressed for more effective climate action. Section 3 details past climate action projects that involved local governments and communities in Cambodia and drawing out lessons from implementation. It further describes the role of local governments in these pilots and the criterion for allocating and monitoring grants. Section 4 chronicles a range of potential local climate actions that could be financed through leveraging commune/sangkat funds (C/S Fund) and incentivizing local climate smart investments. Each subsection describes interventions across three sectors (agriculture, forestry, and energy, with small-scale infrastructure featuring as a cross-cutting theme) and presents evidence from best practices from interventions across the region. Many of these, particularly various forms of small-scale infrastructure, have already been financed through previous pilot projects. The report concludes with policy and operational recommendations to scale up local climate actions in Cambodia.

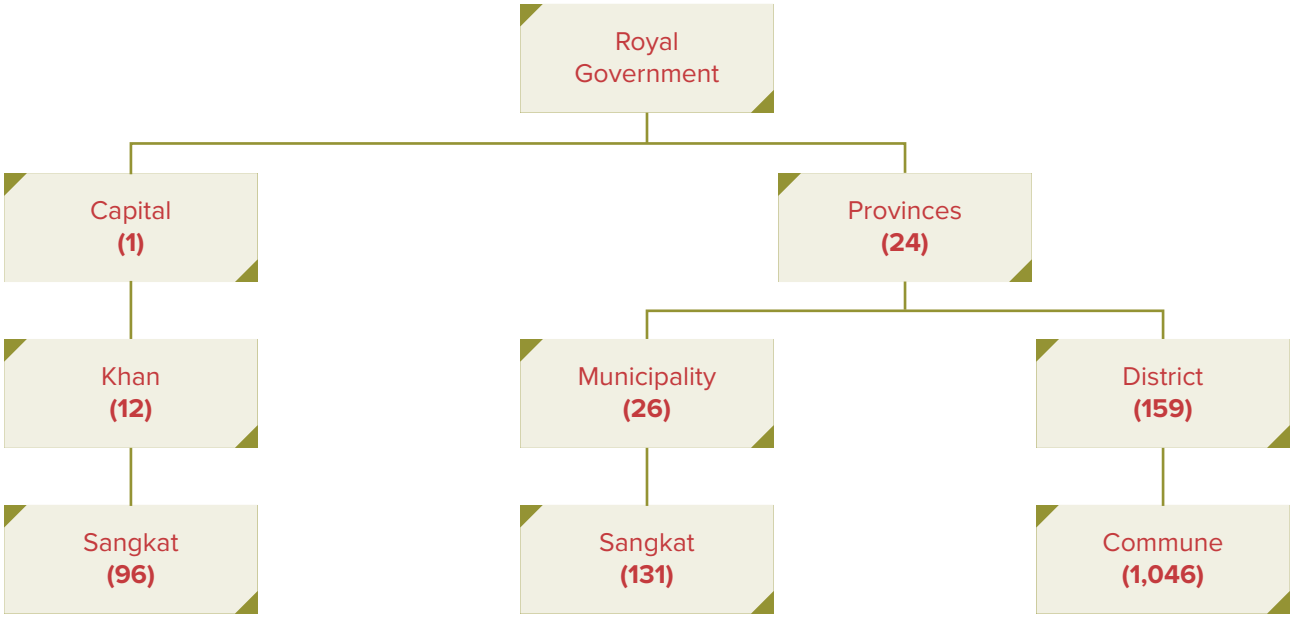
CHAPTER 2.

Institutional Mechanisms for Enabling Locally-led Climate Action

To deliver climate finance and accelerate action at the local level, it is necessary to understand the Cambodian government's decentralization laws, institutions, and processes. This section describes the legal framework, budgetary processes, and planning cycles that govern SNAs. In Cambodia, these are comprised of provinces, which are subdivided into districts (called khans in Phnom Penh, the capital city) and municipalities. Underneath districts (or Khan in the capital) sit sangkat and communes. Sangkat are the lowest administrative unit for urban areas, while communes serve the same function in rural areas.

The National Program on Subnational Democratic Development is an overarching policy that has guided decentralization efforts in Cambodia. In Phase I, which ran from 2010–20, the RGC made progress in bringing service delivery closer to the people, reforming the workings of SNAs at the district and provincial levels. Phase II aims to further the progress started under Phase I. More information on the challenges and achievements of decentralization to date is detailed in section 2.2.

Figure 1. **Subnational Administrative Structure, as Laid Out in the 2008 Organic Law[3]**



[3] Under Phase II of the National Program on Subnational Democratic Development, some revisions to this structure are expected. Provincial administrations will be changed to regional administrations. The structure, management systems, and functions of regional administrations will be reviewed in accordance with the principle of unified administration. Phnom Penh as a capital administration will be changed to a metropolitical administration, with its structure and functions revised as needed. Communes and sangkat will retain their functions, and Phase II aims to strengthen these and revise the technical guidelines to support their implementation.

2.1 Key Laws and Institutions Related to Decentralization

Although Cambodian government functions remain highly centralized, decentralization laws and efforts over the last 15 years offer new opportunities to support SNAs to undertake climate change planning and manage finance. The 2008 Organic Law provides the basis for deconcentration and decentralization reforms. The Organic Law affirms the role of the capital, provinces, municipalities, districts/Khans (districts within the capital) to be governed by elected councils, who serve five-year terms, and a board of governors, who serve four-year terms. Governors at the capital and province level are appointed positions, selected from eligible civil servants in the Ministry of Interior (MOI). Governors and deputy governors cannot vote in council meetings, as they play a supportive rule to councils. The board members are tasked with (i) providing advice on strategies and systems and evaluating performance; (ii) implementing council decisions; and (iii) supporting councils to meet their goals (RGC 2008). Provinces are divided into municipalities and districts. Municipalities are further subdivided into sangkat, while districts are divided into communes and sangkat. Governance of communes/sangkat is detailed in section 2.2.

The government has stipulated laws and policies that govern subnational fiscal transfers and budgeting requirements across levels of administration. These include the Law on Public Finance System and the Law on Subnational Fiscal Regime and Property Management. Furthermore, the National Program 2 (NP2) highlights to interlinkage aspects: fiscal decentralization and SNA planning and budgeting (RGC 2021). Fiscal transfer decentralization concerns the national transfer of resources and enhancing the efficiency of collection of local revenues. SNA planning and budgeting related to ensuring how these resources should be managed and use in an effective, accountable, transparent, and equitable manner (a detail table of the fiscal timelines can be found in Annex 4). NP 2 also underscores the importance of mainstreaming climate change resilience, disaster risks reduction and reducing risks of resources infectious diseases.

Decentralized climate action is relevant across many ministries. Key institutions that play crucial roles in decentralization policies that are relevant to climate action include the National Committee for Subnational Democratic Development (NCDD), MOI, Ministry of Finance (MEF), National Council of Sustainable Development (NCSD), and other line ministries. Their roles are described below.

Role of the NCDD

The NCDD is the primary institution responsible for decentralization in Cambodia. It was created as part of a broader effort to expand democracy through the National Program on Sub-National Democratic Development, which is currently in its second phase (2021–30). The second National Program will be implemented through two five-year implementation plans, as well as the annual work plans and budgets of the NCDD. At the ministerial level, the NCDD has 16 members and is chaired by the Deputy Prime Minister. All ministries and subnational authorities are required to implement NCDD decisions (ADB 2018). The NCDD has various subcommittees that were established under the 2008 Organic Law. The subcommittees, which meet three times per year, are responsible for conducting research on relevant topics, monitoring, and evaluating the progress of the reform, and documenting challenges (RGC 2021). They report to the NCDDS, which is the main body and a key advocate of better fiscal decentralization.

Role of the MOI

The MOI is responsible for supervising subnational performance and supporting capacity development. It leads, coordinates and support subnational government administration to perform their proper functions in accordance with the Law on Capital, Province, Municipality, District, Khan Administration, Commune/ Sangkat Administration Law and related regulations. At the commune/sangkat level, the MOI provides clerks (commune assistants), who play a vital role to assist commune governments and ensure the functional administration of the commune (Dany and Lebel 2020).

Role of the MEF

The MEF has taken gradual approaches to fiscal decentralization reform in Cambodia. For the levels of Commune/Sangkat, districts, and municipalities, fiscal transfer funds have been established by sub-decrees which channel financial resources from the national to the subnational level (RGC 2021). Sub-National Investment Facility (SNIF) has also been established since 2016 to provide funds for investments of all three levels of subnational administration in civil works such as sanitation, health, infrastructure, and education (RGC 2021; Rohdelwohld, 2023). Over the years, the MEF has gradually increased fiscal transfers to the Subnational Administrations (SNAs).

Role of the NCSD

The NCSD is the key government body responsible for climate change policy. It was established in 2015, the product of the consolidation of four committees: the National Committee for Climate Change, the National Council on Green Growth, the National Biosafety Secretariat, and the National Biodiversity Steering Committee. The Minister of Environment chairs the NCSD's Executive Committee. The NCSD coordinates climate change activities in Cambodia and encourages implementation through sectoral ministries and decentralized administrations.

Role of Line Ministries

In Cambodia, ministries are primarily active at the national level, with some responsibilities devolved to the provincial level. The transfer of responsibilities to SNAs has been slow. Three ministries have been responsible for the large bulk of deconcentrated provincial spending—the Ministry of Education, Youth and Sport, the Ministry of Social Affairs, and the Ministry of Health (ADB 2018). The Ministry of Environment (MoE) has been involved in initiatives to provide climate change resilience responsibilities through small district grants (ADB 2018). In the National Program Phase II (NP-2), a priority activity is to conduct organizational analysis to define the functions implemented by the subnational administrators (RGC 2021).

The technical inputs and linkage from MoE and Ministry of Agriculture, Forestry and Fisheries (MAFF) can be strengthened in local climate actions. Although the MoE is the national implementing partner for some major climate change adaptation CCA projects (see Annex I), its engagement has been relatively minimal, hence can be further strengthened. The MoE's role was largely to support targeting by providing a map with vulnerability data to help identify priority areas for investments; but the map should be made more accessible to inform local climate resiliency planning, as the national vulnerability index is not decentralized further than the district level.[4] The MAFF has also had limited engagement, though many of the investments made through the program focus on rural areas and are related to agriculture. See Annex 1

[4] See the national vulnerability index website, https://ncsd.moe.gov.kh/standard_report_visualize_final_report/d3_c_report/vulnerability?portal_id=16751andstandard_report=10706.

for a summary of projects to date. Therefore, closer coordination and engagement across relevant sectoral ministries will need to be strengthened to enhance the environmental sustainability outcomes and avoid maladaptation but also enable local communities and governments' access to sectoral resources and expertise needed for addressing climate impacts.

Mainstreaming climate change remains challenging across ministries. Although the Cambodia Climate Change Alliance project supported the Ministry of Mines and Energy (MME), the Ministry of Rural Development (MRD), and the Ministry of Public Works and Transport (MPWT) to develop Climate Change Action Plans, there is no evidence of implementation of these ministerial plans (Bann and Chun 2022). A GIZ review found that Climate Change Action Plans have a 92 percent financing gap, as climate change is not mainstreamed into core systems and budgeting practices (NCSD 2017). At the subnational level, climate change mainstreaming occurs in SNAs that are involved in climate-focused projects like LGCC.

Delineation of responsibility horizontally between ministries, and vertically within SNAs, is not always clear for some climate-sensitive sectors. For instance, irrigation policy falls within the purview of the MRD, the Ministry of Water Resources and Meteorology (MOWRAM), and the MAFF, without official letters defining which ministries are responsible for which infrastructure and at what scale. In practice, ministries that are more powerful are more likely to take on irrigation work (Parsons 2022).

2.2 Achievements and Challenges of Decentralization Efforts

Cambodia's subnational democratic development reforms began with elections in 2002, with the establishment of commune/sangkat (CS) councils. Building on the successful reforms at the CS level, the RGC expanded this reform to all SNAs in the country through the establishment of capital/province and district/municipality/Khan councils. In 2010, the RGC adopted its first National Program on Subnational Democratic Development to bring service delivery closer to people, reforming the workings of SNAs at the district and provincial level. Prior to this (1992–2002), most public services were delivered by national technical departments and offices at the district/municipality/Khan level (RGC 2021).

The first phase of decentralization saw some major achievements, including the establishment of elected SNA councils, the implementation of approximately 2,000 small-scale infrastructure and social service projects by SNAs per year, and women empowered to take leadership roles in SNAs. Under the highly centralized system that predicated the National Program, commune/sangkat level had never received regular budget transfers before, a major achievement of fiscal decentralization. Importantly, the key decentralization laws provided a basis for delegating functions to SNAs (ADB 2018).

Yet the first phase of decentralization reforms was slow, delayed by a lack of commitment from responsible institutions, lack of clarity about how to proceed, and low prioritization by relevant ministries (RGC 2021). As a result, the public has very limited understanding of the reforms, and citizens generally do not know how to hold SNAs and councils accountable to them (RGC 2021). Complicating the matter, most external funding that supported decentralization was interrupted in 2018, which majorly reduced technical assistance to support reforms. In the interim, the RGC has instructed ministries and SNAs to use their budgets to support priority activities.

During the first phase of decentralization, insufficient financial resources were transferred to SNAs. Although commune/sangkat governments were granted access to resources through C/S Fund, the amount has been insufficient to perform their transferred functions adequately and respond to the needs of the people they represent (RGC 2021). While subnational expenditure has grown, Cambodia remains

a lowly decentralized country when compared internationally (ADB 2018). Provinces maintain budgetary control over districts, municipalities, khans, and sangkat (OECD and UCLG 2022). There remains a mismatch between allocations in urban and rural areas, and there is a need to review the procedures for allocated resources between SNAs to ensure equity (OECD and UCLG 2022). Fund transfers from the national to commune/sangkat level can still be a lengthy process, though this has improved over time. It was initially a 14-step process to transfer funds from the national administration to the commune/sangkat level (UNCDF 2018). Today, the process takes about 6 steps, and transfers take between 28 and 45 days to reach the commune/sangkat account.

Cambodia's current vision for decentralization aims to enable SNAs to assess, manage, and effectively respond to climate change vulnerabilities, natural disasters, and serious infectious diseases. The second phase of decentralization is outlined in the NP-2, which runs from 2021–30 (RGC 2021). NP-2 aims to mainstream efforts to build resilience to climate change and disasters into service delivery, coordinated by Climate Change and Disaster Response and Serious Infectious Diseases Committees (CDIDCs) at the province and district level. Technical standards for infrastructure development will also be reviewed to ensure they take into account climate risks. According to NP-2, agricultural support activities will also be amended to encourage more climate-resilient production techniques. Lastly, NP-2 prioritizes strengthening the use of data on climate change to support the design of investments for resilience.

CHAPTER 3.

Decentralizing Climate Finance and Action: Leveraging the C/S Fund and Mainstreaming Climate into Local Planning

The RGC's preferred modality for climate change financing is direct budget support, as stated in its Climate Change Strategic Plan. Rather than delivering finance through projects with parallel infrastructure, Commune Investment Fund can be a platform for delivering climate finance while serving local development priorities. For commune and district-level governments, an unfamiliarity with climate can impede risk-informed decision making. Yet working through government systems and supporting them to understand and plan for climate risks is the clearest way to build strong capabilities over time. Over the coming decades, these capabilities will be a vital resource to help Cambodia face the significant challenges that climate change poses to its development trajectory.

3.1 Opportunities for SNA Engagement in Local Climate Action

To integrate climate action into local development plans, alignment with existing planning processes is a key starting point. This can be done by integrating climate risk and resilience consideration in the development plans at commune levels. Communes are responsible for preparing and implementing development plans, which are updated annually. The commune's Planning and Budgeting Committee organizes consultative meetings with village chiefs, deputies, and members of the commune about their top development priorities across five sectors: economic development, social affairs, natural resources, gender, and security.[5] Based on these meetings, they prepare and adopt budgets that correspond to priorities and detail these in the CIP. Communes and sangkat have a C/S Fund, where annual transfers from the national level are allocated according to a formula based on population and other factors. Grants from domestic and international sources are also permitted, which in the past has enabled top-ups to C/S Fund from climate projects.

Districts are granted responsibility for supporting commune and sangkat councils and play a key role in supporting capacity for climate action. Under the 2008 Organic Law, districts are to regularly communicate with communes and sangkat and build capacity, resources, and awareness of councilors and staff in conjunction with the MOI, which has overall responsibility for capacity building at all levels. At the district level, building capacity to understand climate risks and conduct vulnerability assessments is an important measure to indirectly support communes/sangkat, which rely on them. Building the capacity of districts enables them to mainstream climate risks into development plans year after year; the district puts together a five-year development and three-year investment plan based on results from communes

[5] The template for a commune investment plan includes columns on these four priority sectors.

and sangkat. This is done through a District Integration Workshop, a step meant to harmonize local-level planning with provincial plans. The district integration workshop may be attended by NGOs, line departments, and commune councils, enabling communes to access resources funded and managed by aid agencies or provincial departments (Romeo and Spyckerelle 2003).

Despite the opportunities, climate risks and resilience have not been systematically integrated into CIPs. In part, this is due to insufficient finance, even though in 2022 commune administrations received an increase in annual budget transfer which amounted to an average of US$127,000 per commune/sangkat. About 57 percent of commune budgets in 2022 were spent on administrative costs and unplanned expenses, leaving only 43 percent of budget for investments in development priorities. Of this remaining budget, the majority is spent on economic development needs (such as infrastructure), while only 2 percent of the budget was spent on social needs, natural resources and climate change needs, and security needs collectively (API 2023). In particular, a total budget allocated for natural resources and climate change was 0.8 percent in 2021 and 0.3 percent in 2022 (API, 2023). In the communes included in this study, C/S Fund had been considered largely insufficient to meet the myriad development goals of commune/sangkat. Considering these limitations, SNAs sometimes make compromises that leave infrastructure vulnerable. For instance, roads are sometimes built too low and are not equipped with water culverts, exposing them to flood damage risk (Dany and Lebel 2020).

Furthermore, commune council administrations often lack incentives and capacity to work on climate action. Though commune development planning templates include "natural resources and environment" as one of five priority areas for local government investment, mainstreaming climate change into development plans remains challenging. In practice, social and economic planning around health, education, and livelihoods is treated as distinct from climate action, rather than areas that are already affected by climate pressures that would benefit from climate adaptation measures. This is compounded by a limited knowledge of the importance of climate action and the potential benefits, which inhibits SNAs from taking action (Dany and Lebel 2020). Capacity building for commune and district-level governments to understand these risks and benefits is vital. Even where climate change is understood to be important, SNA staff have limited expertise to translate climate projections and data into actionable projects or investments (Dany and Lebel 2020). Further compounding the issue, SNAs lack decision-making authority over key sectors related to climate change, including major water infrastructure investments or land use allocations.

3.2 Incentive Mechanisms to Deliver Climate Finance at the Local Level

Cambodia has a decade of experience piloting an incentive mechanism for local government to finance local climate actions. This has been done primarily through PBCRG delivered at the commune/sangkat level. Many of these projects have had similar activities and outputs, focused largely on providing small-scale infrastructure, though they have relied on slightly different implementation modalities for their grant recipients (see Annex 1 for list of relevant initiatives). The modality is largely based on the global Local Climate Adaptive Living Facility (LoCAL) methodology developed by United Nations Capital Development Fund (UNCDF) and first piloted in Cambodia in 2011 under the LGCC project. The method involves channeling PBCRG through existing government fiscal transfer systems. The finance is delivered directly to communes, which serves as a financial top-up to cover the additional costs of making investments climate resilient. PBCRG are channeled through the National Treasury and executed and reported as part of the budget resources of the local governments.

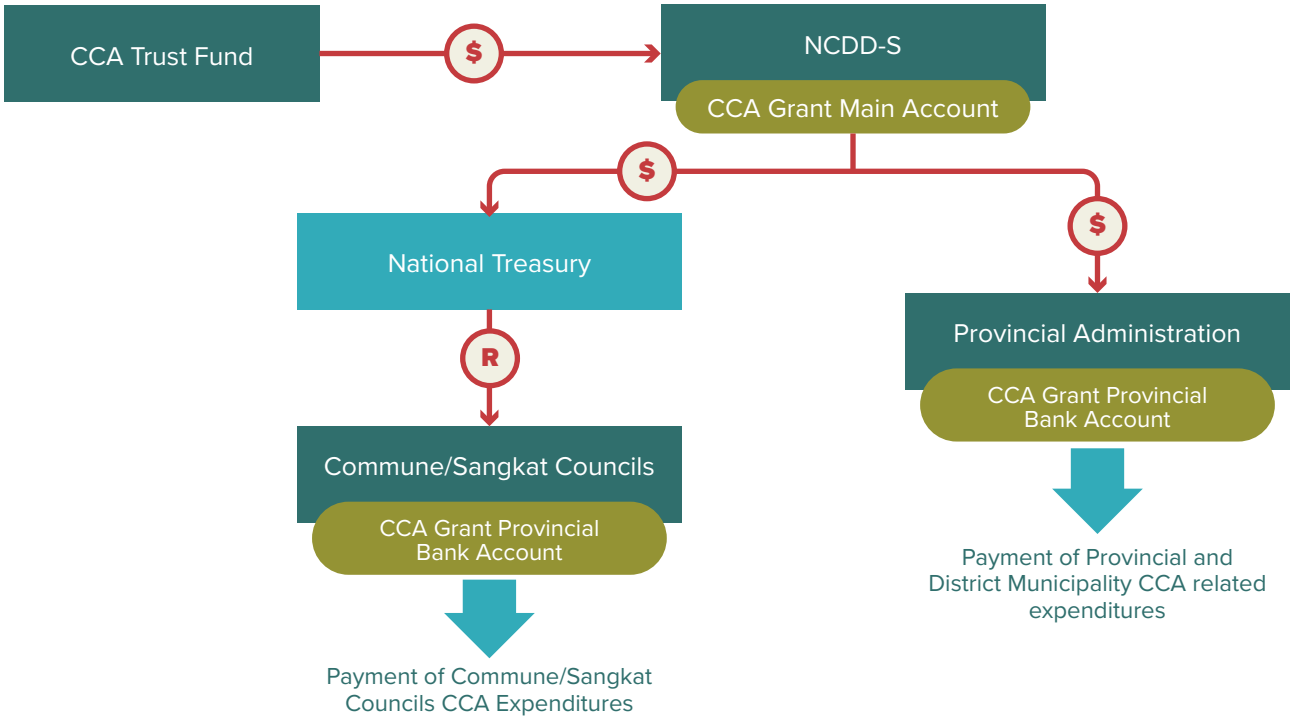
PBCRG is a modality that works through the C/S Fund, which is designed to provide incentives for local government to invest in people-centered development. Access to grants enables subnational authorities to respond to local development priorities while providing additional finance to governments that are more effectively able to deliver climate-resilient investments. The modality has been supported by a range of donors and projects, including PBCRG investments from LGCC-II, ASPIRE, SRELFOOD, and SRL projects (not including LGCC-1). From the Cambodian government side, NCDD manages PBCRG implementation and provides support to SNAs to deliver on local climate priorities. See Annex 1 for a mapping of select projects disbursing grants to the local level.

Activities financed by PBCRG to date fall into three categories. The first is climate-proofing infrastructure, to protect it from climate stresses. One example might be to use flood data to raise a bridge or road that was already being constructed. The second is climate adaptive infrastructure, or infrastructure that directly supports people to adapt to climate change, such as irrigation canals or rainwater harvesting infrastructure. Finally, the third category includes services for strengthening climate resilience. In some projects using PBCRG modality, multiple investments are combined—for instance, in a commune that rehabilitates part of their canal system, while supporting the formation of a self-help group (a form of small savings group), and training women in climate-smart practices for vegetable gardens.

To date, subnational governments in Cambodia have invested over US$2,873,305 directly from C/S Fund into climate priorities. These investments were made in the context of PBCRG interventions originating from ASPIRE, SRL, SRELFOOD, and LGCC-II projects (not including investments from the original LGCC-1 pilot, which occurred prior to 2015). This sum amounts to 60 percent of the total cost of these investments, in which the remaining amount was financed through PBCRG top-ups. The time to scale up investments rather than focus on designing pilot is here, as SNAs across 11 of Cambodia's 25 provinces have some exposure and understanding of PBCRG modalities (see figure 6 for PBCRG investments by province) and the need to scale up local climate action is pressing.

Vulnerability Reduction Assessment (VRA) is the main tool for assessing climate risks and community needs, which is crucial for identifying and prioritizing local climate-resilient investments. VRAs are conducted by commune councilors, with the support of the district government officials trained on the VRA Methods (UNDP 2014). This process is vital for strengthening accountability and improving local governance, as it pushes the local authorities to meet directly with community members and work to better understand their needs. The results are then used to prioritize climate actions in the CIPs. According to NCDD-S, the district is the correct tier of local government to support the implementation of VRAs and use this information for planning investments through the district climate change strategy. In pilot phases of PBCRG projects, the national and provincial level often provided assistance to conduct VRAs. For future PBCRG projects, NCDD-S aims to empower district-level officials to lead the process.

Figure 2. **Flow of Climate Finance from National to Commune/Sangkat Level**



Source: Local Governments and Climate Change project document (unpublished), "PBCRG Programming Process."

Findings from VRAs feed into planning at commune, district, and provincial levels. As part of the decentralization process, subnational plans are harmonized from the bottom up. CIP findings about climate vulnerability and investment needs feed into the district climate change strategy, which then informs provincial-level plans. At the district level, priority investments are combined from different CIPs into a District Priority Actions Matrix (DPAM) in a district-level integration workshop. DPAMs are forwarded to a provincial integration workshop, where various line departments and NGOs can agree to support CIP projects and sign a nonbinding contract stating their commitment to do so (Dany and Lebel 2020). Province and district-level integration meetings are important entry points for mainstreaming climate change into subnational planning, as are the commune planning meetings to develop CDPs.

Based on CIPs and district climate change strategies, communes apply for a competitive grant to top up their regular C/S Fund resources to finance small-scale infrastructure or social services that would improve community resilience.[6] The proposals are selected based on the vulnerability of the commune, alignment with CIPs and the district strategy, and quality of the proposals. Decision making has two key levels: the Grants Award Committee at national level and the district council at local government (grantee) level. At national level, the Grant Award Committee exercises approval authority over selection of target districts, the grant allocation formula, and the list of eligible expenditures of the grants.[7]

[6] Projects that used the PBCRG include the SRL, LGCC, and International Fund for Agriculture Development (IFAD).

[7] Selection of target districts: local governments will be selected for PBCRG funding with priority to the most vulnerable areas based on a climate vulnerability index developed by the Ministry of Environment, subject to (i) compliance with minimum access conditions and (ii) absence of any closely equivalent climate change adaptation funding.

Box 2. Lessons from a Decade of Piloting PBCRGs

After a decade of performance-based climate resilience grant (PCBRG) pilots, lessons have emerged about how to implement grants so that they can work more effectively to serve the needs of communes and sangkat.

- **Co-financing contributions can detract from other commune/sangkat priorities**. The PBCRG modality requires communes to co-finance climate resilience interventions. Though the initial PBCRG pilot assumed that the grant top-up would be 33 percent of the total cost, and the commune would contribute 66 percent, this proved to be too high, as it prohibited communes from addressing other community needs and requests. As a result, the allocation formula has reversed for subsequent PBCRG investments, in which the communes are expected to contribute 33 percent of the cost of the climate-resilient investment from their commune investment fund. The PBCRG may cover the remaining 66 percent of the investment cost. The only exception is "services for climate change adaptation," in which there is no co-financing requirement.
- **Conducting Vulnerability Reduction Assessments (VRAs) requires additional capacity building**. Districts and communes need support to conduct VRAs to determine which investments are the most important to support climate resilience. In pilot projects, National Committee for Sub-National Democratic Development (NCDD) staff from national and provincial levels supported the VRA process. As the project reaches new districts, however, additional capacity building will be required, particularly at the district and commune levels.
- **Commune assistants are key stakeholders**. Although commune governments are elected politically every five years, commune assistants are civil servants that are recruited and appointed as Ministry of Interior officials. They are responsible for assisting commune governments to ensure a functional administration. They have formal qualifications and can be useful agents to support climate resilient development. Targeting commune assistants for capacity building could better enable local governments to integrate climate concerns into the development work of communes/sangkat.
- **Medium-sized grants may improve impact**. The NCDD is considering piloting medium-sized investments in the future, combining commune budgets, and working at the intra-commune level. Rather than focusing only on the commune-level, these grants could provide medium-scale infrastructure but still use the same VRA methods and work directly with subnational administrations (SNAs). This method could allow prioritizing investments that could serve multiple communities and work on climate resilience at a landscape or meso-watershed scale. Following the subsidiary principle, these grants could be managed by district-level governments, where they can oversee multiple commune/sangkat needs and line departments can bring in necessary technical expertise.
- **Performance assessment must use clear, measurable indicators**. The PBCRG methodology delivers grants to SNAs based on their performance, which is assessed annually. Over time, the NCDD found that some indicators were too difficult or resource-intensive to assess. In developing criterion to measure the performance of SNAs, the PBCRG operations manual recommends using bivariate indicators (yes/no questions) or indicators that are easily quantifiable.

Source: a. Davy and Lebel 2020.

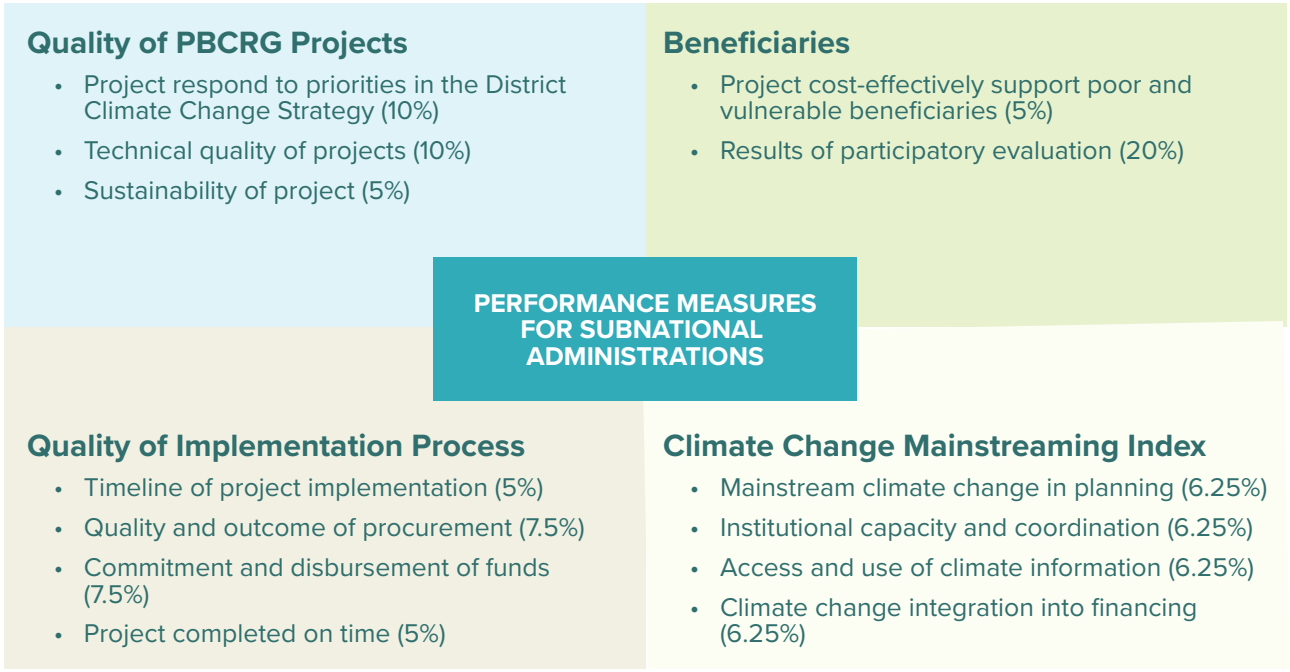
3.3 Allocation Criterion for PBCRGs

To access a grant, the SNA must comply with "minimum conditions," which are intended to avoid wasting grant funds if they cannot be used effectively. The minimum conditions should be related to the purpose of the grant—for instance, completing a Climate Change Adaptation Strategy—or general indicators of good governance and sound financial management. For the latter, demonstrated ability to execute a budget (actual expenditure as a percentage of planned expenditure in the past financial year)

could be one suitable indicator. Importantly, the information should be easy to access and verified, so this could include information that NCDD-S already collects for another purpose. The grant application form includes information on how the SNA complies with minimum conditions. NCDD-S is responsible for helping SNAs comply with minimum conditions, by instructing them on what needs to be done to qualify for a performance-based grant and recommend that grants committee approve the award with a condition that the grant cannot be released until the SNA complies with minimum conditions.

Tracking local government performance is an important step of the PBCRG modality, but the indicators used to assess performance may need to be adjusted. Designing effective performance measurement systems is a complex process, and past LGCC implementation found that indicators were not sufficiently clear or relevant to the purposes of the grant, were too costly to measure accurately, or were not challenging enough for SNAs, which meant that all SNAs scored 100 percent on that indicator. The current set of indicators are divided into four categories: (i) quality of PBCRG proposal; (ii) beneficiaries; (iii) quality of implementation process; and (iv) the Climate Change Mainstreaming Index. Each of these has indicators which count for 25 percent of a local administration's total performance measurement score.

Figure 3. **Performance Measures for PBCRG**



Source: NCDD 2019.

An annual performance assessment is carried out in each SNA, which is used to calculate the performance-based grant allocation for the following year and to help integrate the grant into the annual budget (see section 2.5 for more detail). Higher performing SNAs may receive larger grants. To conform with the budget cycle, the annual performance assessment must be carried out in July or August. NCDD-S staff are responsible for conducting the assessment or contracting a service provider to do the assessment on their behalf. The assessment is based on a range of performance measures, but the choice of these will depend on the purpose of the grant. All performance assessments track four areas: quality of the projects, quality of implementation, beneficiaries' perspectives, and climate change mainstreaming in budgets and planning. The score related to the beneficiary subsection is largely derived from a participatory evaluation, which is conducted with communities using a methodology similar to a citizen's scorecard. This aims to capture local people's view of whether the project achieved its aims or not.

The existing performance measures can unfairly penalize commune administrations, according to commune councilors included in this study. Transfers from the national government can take longer than anticipated, slowing down project implementation and expenditure. As a result, commune governments could score poorly on their timeliness of project implementation and on disbursement of funds. Furthermore, commune councilors mentioned that they could not understand the scoring, making it difficult for them to ensure they were prepared to perform well. Similar concerns were reiterated for indicators related to the Climate Change Mainstreaming Index (see figure 3).

3.4 Alternatives to PBCRG: Lessons from Kenya's County Climate Change Funds

Outside of Cambodia's PBCRG-dominated climate finance landscape, other methods of decentralizing climate finance offer alternative models for institutional reform and delivery mechanisms for climate action at the local level. Much of the analysis in this report focuses on outcomes and lessons from PBCRG (see section 3.5), as this modality is the dominant delivery channel for climate finance to the local level in Cambodia. Yet PBCRG has limitations, and future efforts to strengthen the institutional mechanisms for delivering climate finance should incorporate lessons from other initiatives. Notably, the Kenya County Climate Change Fund (KCCCF), which is supported by the World Bank through the FLoCCA programme, offers a promising alternative model for scaling local finance to the national scale (Arnold & Soikan, 2021).

PBCRG has proven that local governments in Cambodia could be key actors in delivering climate finance, but the model has limitations for implementation at the national scale. Capacitating local governments to respond to their constituents' needs and understand climate action priorities at the local level requires working through government systems, rather than relying on parallel delivery systems. PBCRG's modality finances only the 'additionality' of climate-proofing an investment, a distinction that is arbitrary to the way other local development priorities are financed. Furthermore, PBCRG delivers finance from project bank accounts to C/S Funds, rather than entirely through government systems. Lastly, Communes and Sangkats must be empowered to plan for climate-related challenges and needs more flexibly and draw in technical expertise from district levels where needed, rather than treated as implementers of cookie-cutter national programmes with a "menu" of development options to choose from. This challenge is much wider than Cambodia alone; a large-scale empirical review of nearly 1,500 climate adaptation case studies found that local governments are largely treated as implementers of national plans or programmes, rather than designers and developers of climate action (Petzold et al., 2023).

Kenya's County Climate Change Funds provide an example of climate finance governance that enables local decision-making to be complemented by technical support from line ministries at the County-level. This helps further the subsidiary principle of the locally-led adaptation principles, in which decisions are meant to be made at the lowest appropriate level. In Kenya, the ward level has been deemed the lowest unit of local governance appropriate for decision-making. Financing decisions are made through the Ward County Climate Change Planning Committees after community-consultation on priorities. The Ward Climate Change Planning Committees include representatives from different social groups and livelihood systems within the 'ward' (Crick et al., 2019). Higher level government at the county-level provides technical support to committees but does not have any decision-making power over the types of investments made and where they are made. This arrangement furthers LLA Principle 8, collaborative action and investment, in which different scales of governance support each other for climate action planning. For instance, the County directors of meteorology participate in the Climate Change Planning Committees and support the Ward-level committees to specifically address and incorporate climate change and uncertainty, while creating avenues for two-way communication between the county and community-level actors on weather and climate information (Crick et al., 2019).

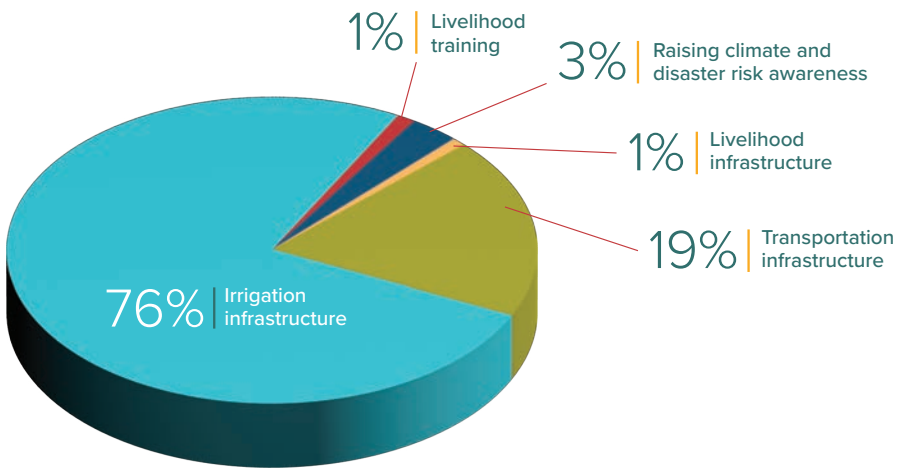
There are unique benefits to the KCCCF model that could be applied to devolving climate finance in Cambodia. Firstly, the KCCCF is not reliant on finance from a single donor, but can be capitalized from county development budgets, national climate funds, or development partners. Of the total funding, 70 percent goes to the wards for investments in adaptation, while 20 percent is reserved for the higher-level county governance support, and 10 percent of budget is dedicated specifically to consultation costs, monitoring the projects, and developing proposals (Coger et al., 2022). This channels most funding to the local level but leaves 20 percent of funding for landscape-level investments into services like veterinary or health care that are better done at the county-level. Lastly, the strategic criteria for the KCCCF are broader than those of PBCRG, focusing on social and economic dimensions of climate resilience (see figure 3 for performance measures of PBCRG). They include public goods with broad benefits, support to livelihoods or services that people depend on, any support to adaptation or mitigation measures, and investments that encourage harmony and peace in the community.

Going forward, the Government of Cambodia should aim to deliver climate finance directly to subnational administrations and support participatory planning for climate action, inspired by the model of the Kenya County Climate Change Fund (KCCCF). Adapting this model to Cambodia might entail broader participation in climate change planning at the Commune/Sangkat level, a specific technical assistance role for the District and Provincial levels of Government, broadening the criterion for what can be financed rather than relying on a narrow menu of options that prioritize physical infrastructure, and finance for the District-level to make landscape-level investments that can support access to services or natural resource management that would improve resilience to climate change.

3.5 The Landscape of Investment in Local Climate Action

Most climate investments through C/S Fund are oriented toward building physical infrastructure, with irrigation infrastructure comprising the lion's share at 76 percent of PBCRG investments. Transportation infrastructure constitutes 19 percent of the measures taken, primarily building roads that are ostensibly "climate-proofed" or more resilient to floods. Only 5 percent of the remaining investments are focused on trainings, raising awareness of climate change and disaster risk, and other forms of livelihood infrastructure to raise livestock or store crops.

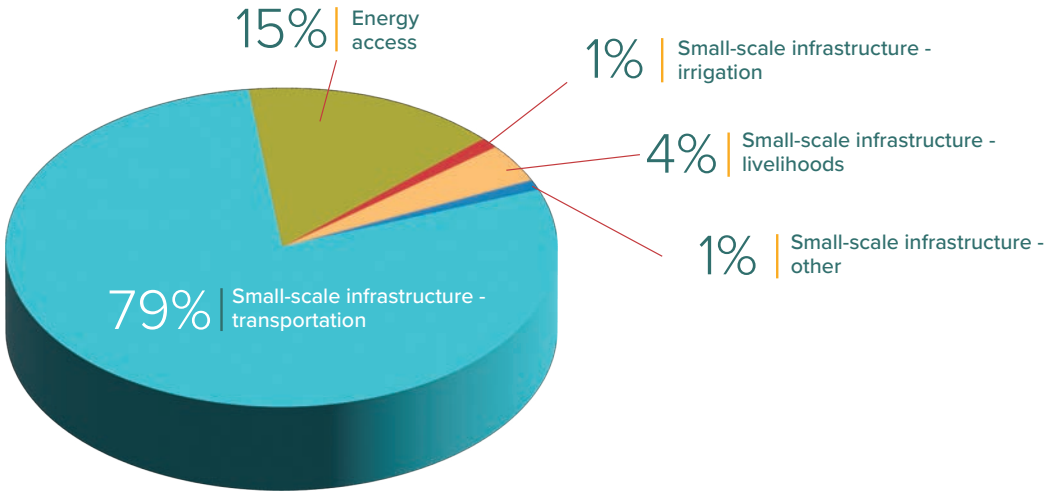
Figure 4. **PBCRG Investments by type**



Sources: GCC-II, ASPIRE, SRELFOOD, and SRL projects (not including LGCC-1).

SNAs that participated in delivering PBCRG had a greater ability to identify climate investments needed in their communities than commune administrations that did not benefit from investments.[8] The proposed climate investments remained overwhelmingly focused on physical infrastructure, especially rehabilitating canals, and paving roads. Such infrastructure can be the basic ingredient of resilience: paving roads so people can access health services and markets, and connecting smallholder farmers to water so they can irrigate their crops. Still, the subnational governments' capacity to plan for climate risks was nascent, and commune governments requested support developing their ability to conduct participatory VRAs and use climate vulnerability maps. Across the five communes included in our study, all commune councilors requested more resources to cover the investment priorities identified in their CIPs.

Figure 5. LEAP Investments by Type



The PBCRG portfolio does not include support to diversify livelihoods away from climate-sensitive sectors like agriculture, which was covered under the World Bank's LEAP project. Though the LEAP project was designed for poverty reduction rather than to further climate action, the project's focus on providing vocational training supported households' ability to earn income that was not directly vulnerable to climate stresses. These skills trainings were offered alongside commune-level investments in physical infrastructure and energy access (see figure 5). Equally, the project helped start savings groups for poor households, particularly women, providing some start-up capital and reinforcing local capacity for managing savings and loans (in some locations, PBCRG modality also supported savings groups). A cost-benefit study of the project found that many of the medium- and longer-term benefits would be derived from the vocational training provided (WBG 2023b). Best practices from the LEAP project's vocational training and LEAP/PBCRG savings groups should be integrated into future investments in climate resilience (see box 3).

[8] Key informant interview with provincial administrator.

Box 3. Shoring Up Livelihoods with Savings Groups: The Story of Kampong Phluk Commune, Siem Reap Province, LEAP Investment

Traditionally, villages in Kampong Phluk are surrounded by water, but more recent climate and environmental pressures on the Tonle Sap Lake have left these communities vulnerable to drought. During drought years, people lack clean water for daily use, are unable to water their livestock, and see major declines in fisheries productivity. These impacts have cascading consequences for family income and food security. Furthermore, children and elderly people are more susceptible to illness, especially as temperatures creep up.

For villages in Kampong Phluk, climate extremes are not limited to drought—floods take a toll on local infrastructure, damaging gravel roads and community ponds and contaminating water for daily use. Floods cut off easy access to health centers located outside of the community, with significant consequences for pregnant women, the elderly, chronically ill people, and children.

In 2018, the Livelihood Enhancement and Association of the Poor (LEAP) project in Siem Reap provided finance to commune administrations to help alleviate poverty in the community. The Commune Planning and Budget Committee mobilized community members, especially poor families, to discuss and prioritize projects needed to respond to their livelihood challenges. As part of the initiative, vulnerable people started savings groups in three villages, with the goal of increasing collective income to invest in climate-resilient agricultural practices and small businesses.

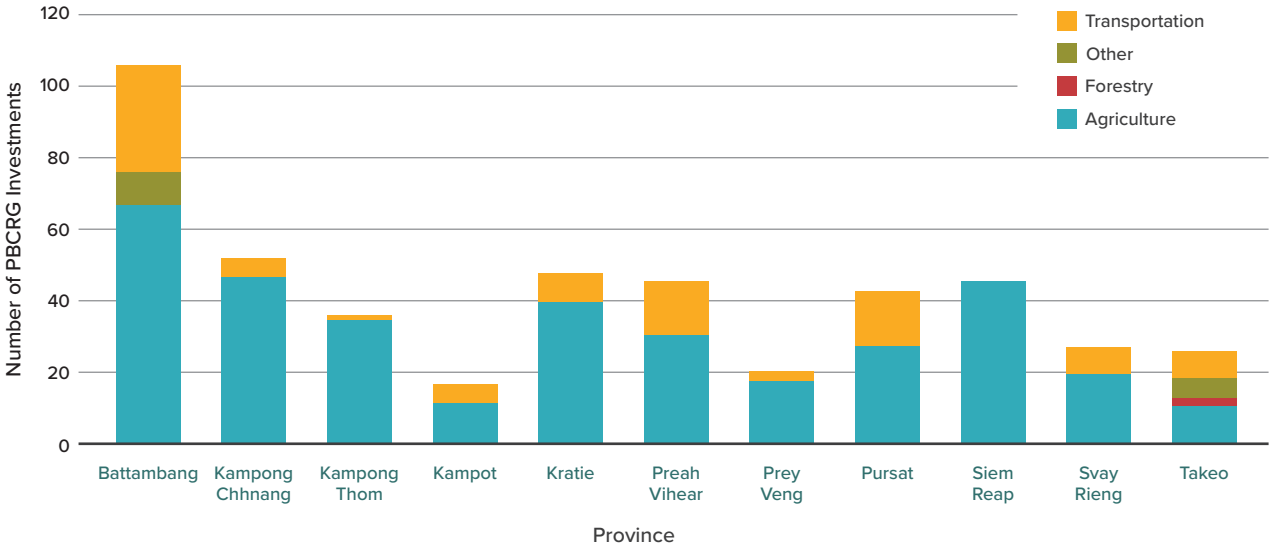
The savings groups have increased finance available for local businesses and helped empower women. The savings group members are overwhelmingly female, giving women an opportunity to take financial agency in their community. Since early 2019, the savings group's capital has nearly doubled from the initial financial infusion provided through the project. Furthermore, the group's repayment terms are far more forgiving than local money lenders, with only a 1 percent interest rate and two-month extension periods for members who are unable to pay back loans for valid reasons. According to Ms. Eav Van, a member of the Dei Kraham Chok Crey savings group, "I borrowed money to buy extra fishing equipment for my household and start a small grocery shop. With increased income, I can support my children's education and my family's survival [during times of drought and flood]."

Figure B2.1. **Dei Kraham Chok Chey Saving Group Monthly Meeting**

By investing in social infrastructure like savings groups, the LEAP project helped create some of the more intangible elements of resilience: stronger trust between community members, more participation in community development planning, and a platform to share information and finance when needed. Establishing this committee alongside investments in physical infrastructure (Kampong Phluk commune also chose to build a road with LEAP finance) helped spread benefits from commune-level investments.

The need for greater geographical reach for locally-led climate action remains strong. Original pilots focused on Battambang, Takeo, and Preah Vihear, and Battambang remains home to the largest share of PBCRG investments. Across all provinces except Takeo, the majority of climate action measures were in the agriculture sector. Within provinces, coverage of districts and communes is not systematic. In practice, PBCRG grants were only able to reach a few communes within selected pilot districts, so needs remain great even in the 30 districts where pilot projects reached. As such, the scale of need for climate action is still significant even in places that have experience allocating C/S Fund for climate action.

Figure 6. **PBCRG Investments across Cambodia, by Province and Sector**



Sources: LGCC-II, ASPIRE, SRELFOOD, and SRL projects (not including LGCC-1).

Box 4. Climate Action through C/S Fund: The Story of Svey Leu Commune

In the unforgiving dry season, families living in Svey Leu commune struggle with water scarcity. As droughts have become more common, households in this mountainous area increasingly lack safe water to water their livestock, irrigate home gardens, and for cooking and bathing. The local reservoir sometimes dries entirely, leaving local people to rely on expensive water delivery services. Without enough water, people, particularly children and the elderly, are more prone to illnesses from contaminated water and having insufficient water for basic hygiene. During particularly intense drought conditions, people migrate to Thailand, as they are unable to sustain a livelihood at home.

Commune councilors included measures to increase safe water access in the commune development plan (CDP), but they lacked sufficient finance to undertake the measures envisioned. When the commune was able to apply for additional finance through the SRL project's performance-based climate resilience grant modality, they conducted a Vulnerability Reduction Assessment to assess priority water needs and decided with community members to restore the community pond in Chub Krom Village. The total construction budget was US$23,669, of which the commune administration contributed US$7,274 and the SRL project provided US$16,365.

Figure B3.1. **Svey Leu's Water User Committee in Front of the Newly Rehabilitated Community Pond**

The community pond restoration project was able to provide a reliable water source to five villages, enabling people to have water stored for daily use. People in the villages paid a membership fee of 1,000 riels to a Water User Committee, which used the finance to buy pipes to connect water to sources closer to the mountains. This connection enabled better water availability during the peak dry season. The membership fee also covered the operating costs of the water system. For local families who were accustomed to paying for water from private sellers, the membership fee was an affordable alternative. Community members estimated that they spent about US$100 for six months of water consumption per family before the project, and now spent about US$10 over the same time period.

CHAPTER 4.

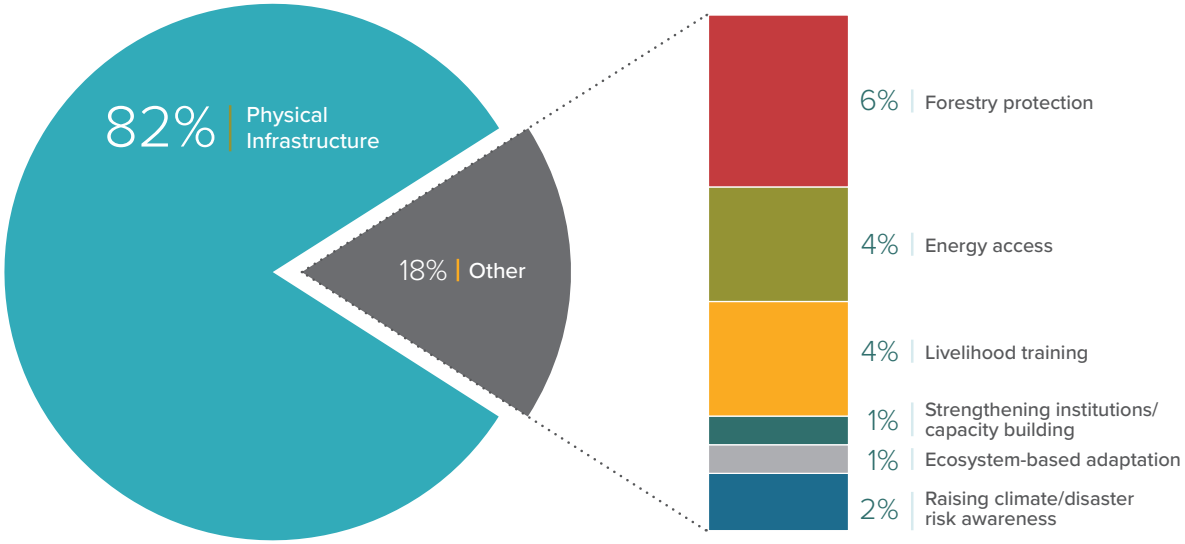
Best Practices for Local Climate Action and Investments

Locally led approaches to climate action are required not only to address climate risks and impacts, but to do so in a way that accommodates the diversity of local needs and knowledge. Even within the same ecosystems or communities, the need for adaptation interventions depends on people's differing vulnerability. If people are not able to participate in decisions about how climate investments should be made, local adaptation strategies can exacerbate vulnerability or only serve the needs of a select few working through subnational governments. Using tools such as participatory VRAs are practical ways to ensure climate action is locally led.

Delivering finance through C/S Fund is a step in the right direction, but more needs to be done to adhere to the locally led adaptation principles. As it stands, SNAs in Cambodia will need more capacity building to develop a robust understanding of climate risk and uncertainty (Principle 5). They also need to ensure that local investments could address structural inequalities within the community (Principle 2), such as ensuring participatory approaches in planning and implementation and taking measures to ensure investments will benefit all community members.

4.1 The Role of Climate-Resilient Small-Scale Infrastructure

Figure 7. **A Summary of 837 Small-Scale Investments across PBCRG and Non-PBCRG Modalities**



Note: This includes PBCRG projects (ASPIRE, LGCC-II, SRL, SRELFOOD), the World Bank's LEAP program, GEF's Small Grants Program, and UN Women's EmPower project.

At the commune level, investments in climate resilience have focused on physical infrastructure that have modest but immediate benefits for the local community—better access to water, improved roads, and more resilient agricultural practices (See figure 7). During the focus group discussions, people emphasized how important these basic services are for managing the impacts of floods, droughts, and heat waves in their communities. To some extent, people may have been influenced in their responses by the available investment options through PBCRG or other community-based climate action projects—if the projects had included a broader range of options, such as measures to address climate risks in health and education, responses may have been different. Still, no community members expressed that the infrastructure was irrelevant to managing climate risks or supporting their livelihoods.

Investing into more resilient infrastructure is important because Cambodia's infrastructure is highly exposed to climate hazards. Climate change will disrupt access to vital services for the Cambodian people, and investing in more resilient infrastructure is an important element of adaptation. Modeling by Alegre et al. (2020) shows that flooding will cut off access to hospitals and schools, disrupting education and worsening health outcomes for vulnerable people. Over 90 percent of Cambodia's rural roads are not paved and at risk of deteriorating during monsoon season when roads are easily flooded (WBG 2023a). The Cambodia Rural Road Policy 2020–30 aims to provide all-season road access to 75 percent of villages by 2030, but current road design standards in Cambodia are not tailored to adapt to climate risks. Design remains based on historic rainfall data, rather than future climate information that can better inform the embankment, drainage, and pavement designs to withstand more intensive precipitation episodes expected under climate change (WBG 2023a). Subnational analysis of national and provincial roads in Kratie and Kampot provinces showed very low pavement coverage (31 percent and 27 percent, respectively), and Kampong Cham showed a severe deficit of water crossing structures for effective flood water passage. These areas in particular face high climate risk exposure and need investments to reinforce local infrastructure.

Climate-proofing infrastructure contributes to the goals of Cambodia's updated NDC. The prioritized adaptation actions submitted by various line ministries include disaster-resilient construction standards for school buildings and health clinics, climate proofing existing and future solar infrastructure, increased access to solar irrigation systems, resilient rural water supply and sanitation systems, and rural road rehabilitation for climate resilience (RGC 2020). Furthermore, one of the keys to enable actions outlined in the NDC to achieve these goals is the implementation of LGCC3, which is a PBCRG program. Delivering climate finance directly to local governments is one of the vehicles for the RGC to deliver on its climate action priorities.

Investing in built infrastructure can improve or exacerbate vulnerability, depending on whether climate considerations have been taken into account. Building roads that withstand floods can help connect rural communities to health centers, schools, and markets to support people's coping capacity during intense rainfall. Investing in sea walls and dikes can help coastal communities manage salinization and improve agricultural productivity. Renovating or building new irrigation infrastructure enables farmers to better manage droughts. Conversely, poorly planned built infrastructure can increase vulnerability to climate change by altering natural flood dynamics and sediment deposit processes (Schipper 2020). Development projects can work against natural systems, exacerbating risk. In Bangladesh, flood control infrastructure eliminated natural floodplains that were an important source of income and food, particularly for women. Water irrigation infrastructure can redistribute risks of water scarcity or flooding among small-scale farmers, and in some cases increase land loss. These risks are reiterated in the Intergovernmental Panel on Climate Change's Sixth Assessment Report, which states that investing in infrastructure can have maladaptive consequences. Hard protections—like dikes and seawalls—can reduce the likelihood of coastal flooding, but they may have negative consequences for natural systems that must be weighed in decisions about local climate action.

What makes infrastructure "climate resilient" is the process of planning, designing, and operating it in ways that help people anticipate, prepare for, or adapt to climate change (OECD 2018). No measures can fully eliminate climate risk, but climate risk can be mitigated by locating infrastructure in areas that are less exposed to climate risks and include design parameters that make infrastructure more resilient to climate impacts. This could mean substituting materials to ensure surfaces are permeable for flooding or adapting design to take into account sea level rise or maximum temperatures. Built infrastructure can be accompanied by "nature-based solutions" or other forms of ecosystem-based approaches, such as planting indigenous grasses for erosion control. In some instances, combining natural and built infrastructure can be cheaper than relying solely on built infrastructure while yielding co-benefits for climate resilience.

4.2 Lessons for Decentralized Climate Finance in Cambodia: Notes from the Field

To date, investments in climate resilience at the local level have largely supported agricultural livelihoods. The bulk of investments in local climate action in Cambodia are oriented toward building infrastructure that helps farmers access markets and improves access to water for irrigation. These benefits were welcomed in the communities visited during fieldwork, as agricultural livelihoods were generally the primary source of income, but other forms of work outside of agriculture are also vulnerable to climate impacts. Women often ran small shops in their villages, but their needs as businesswomen were not well reflected in CIPs, even though their income was also depressed by floods and droughts. Similarly, fishers experienced problems with low catch during times of drought, but measures to mitigate these impacts were not included in plans. Even if there is insufficient funding available for all desired measures, actions to support other forms of livelihoods should still be reflected in CIPs.

Benefits from physical infrastructure were geographically fixed, and thus were not equally shared. Based on fieldwork discussions, the benefits of irrigation infrastructure are reaped by households living closer to the infrastructure. Though this point may seem obvious, the repercussions can mean more stratification within the community—people living closer to the newly invested canals have a higher income from dry season cropping, while people living further out do not have any change in income. In Cambodia, research found that dry season irrigated rice cropping usually benefits better-off households, as the poor are less likely to be able to afford the inputs and take on the financial risk (IWMI 2013). Complementing investments in irrigation infrastructure with noncanal infrastructure like small-scale pumping from groundwater or small reservoirs for households located further away could ensure more equitable spread of benefits.

Children need targeted investments to be more resilient to climate change. Across focus group discussions, men and women reiterated that children faced specific vulnerabilities to climate change. Children were most likely to become ill when water quality declined during droughts and floods. If family income was strained due to disasters, there could be pressure on children to leave school and work to support the family. During heat waves, they were often unable to attend school as the building was too warm. This also impacted children who were responsible for tending to livestock, as their hours in the fields exposed them to high temperatures. Though people were aware of these risks, specific measures to help mitigate the impacts of climate change on children's health and schooling were not addressed through C/S Fund.

Efforts to integrate climate change planning in subnational governments have been largely focused on managing current risk, rather than using climate projections. Although in many cases future risk will be an intensification of current disaster exposure, climate change will introduce novel risks like all-season wildfires, concurrent droughts, salinization of fields, new temperature extremes, and far-reaching storm

surges. For this reason, using climate projections and understanding how they could translate into tangible impacts on livelihoods and across sectors is an extremely important component of decentralizing climate action. Enhancing public access to such data and information as well as making it digestible will enable local governments and communities to use climate data to act.

Investments in institutional capacity to manage physical infrastructure are essential for sustainability. By setting up committees to oversee operation and maintenance of infrastructure, some communes were able to lower the price of water and greatly increase water access piped directly to the household (see case study in box 3). In study communes, people stated that they found the operations and maintenance committees or water user committees to be accountable and transparent. For some community members, there were barriers to participation, as they were too busy tending to paddy fields or did not fully understand why it was important to participate in the planning processes. Across study communes, there was a desire to reinforce local institutional capacity to manage benefits.

Supporting "social infrastructure" is crucial to complement physical infrastructure and help build resilience to climate change. Supporting savings groups, as the LEAP and PBCRG modalities did, can enable people to improve household income without taking on the financial risks that borrowing from local moneylenders with high interest rates can entail. In a similar vein, the vocational training and skills development provided through the LEAP project was a highly regarded element of the project, and enabled farmers to leave agricultural livelihoods to work in sectors that are less sensitive to climate shocks. Physical infrastructure is vital to help people access basic services, but investing in social resilience brings other kinds of important benefits, such as platforms for information sharing, improved trust, and opportunities to improve household income.

Box 5. Flood Management Tool at Sangkat Level, Phnom Penh

Phnom Penh is highly prone to regular flooding that disrupts people's livelihoods and heightens the vulnerability of those living in the flood risk areas. Poor city dwellers who live in informal settlements are particularly vulnerable to the flood impacts, as well as the impacts of urban development projects more broadly. The World Bank's LEAP project has piloted an initiative to strengthen the capacity and use of the flood management planning tool in Phnom Penh to predict, manage, and mitigate flood impacts, by overlaying flood data over administrative boundaries and demonstrating which areas are likely to flood first under different flooding scenarios. The flood management tools have been developed and tested in participatory manner with engaging communities and five sangkat governments. These flood management tools can be downloaded in mobile apps for easy access and online. This tool has informed the sangkat governments to develop their sangkat development plans to address and manage flood risk.

Figure B4.1. **Discussion on Flood Assessment in Sangkat Prey Veng, Phnom Penh**

Finally, assessing vulnerability using VRAs could be challenging. The VRA process uses ordinal scales and relative vulnerability, and it can be difficult for community members to understand how vulnerable they are in comparison to outside communities. Though community perception is important, complementing this with fixed indicators of vulnerability could make VRAs easier to understand and use. Given the heavy emphasis of PBCRG investments on building physical infrastructure, it is worth examining how VRAs can better illustrate diverse needs of children, women, and nonagricultural livelihoods. Across the study area, commune and district-level governments requested more support and capacity building to conduct VRAs and write up results.

4.3 Best Practices of Local Climate Actions from across the Region

The types of projects prioritized in C/S Fund are common in climate change projects across the region, and much can be learned from these initiatives. This section summarizes evidence on what kinds of community-based climate change adaptation and mitigation interventions in the region have been effective and what lessons can be drawn for SNAs in Cambodia. Evidence is drawn from the mid-term and final evaluations of Global Environmental Facility financed climate change adaptation projects in the region, implemented between 2011 and 2021. After excluding projects that were entirely conservation focused or were not community based, the sample included 20 community-based adaptation projects in the ASEAN region and Bangladesh. This was added to the 3 NGO project evaluations identified through the grey literature for a total of 23 projects.

Though lessons can be drawn from elsewhere, climate change adaptation best practices are not one-size-fits-all, and must draw from local knowledge. Each initiative must evaluate the stresses and future risks local people face from climate and land use change and determine how best to mitigate their impacts so people can successfully adapt. This is why the principles of locally led climate action (see section 1) are important; strong participatory approaches are the foundation for building resilience in an equitable and sustainable way.

4.4 Locally Led Action for Resilient Agriculture

Investing in climate-resilient agriculture will be a key local climate action in Cambodia. Climate change will affect all aspects of Cambodian society, but the effects are expected to be the worst in the agriculture sector. For the more than 80 percent of Cambodia's poor who live in rural areas and are dependent on agriculture, these hazards could significantly worsen inequality. Without adaptation measures, yields of rainfed rice are projected to fall by 21 to 30 percent between 2030 and 2060 (WBG 2023a). Rainfed maize and cassava production will also be negatively impacted, falling by 6–9.2 percent and 5–11.2 percent respectively. The decline in inland fisheries in 2019, resulting from the drop in the water level of the Mekong River and Tonle Sap Lake, would result in total economic losses in the range of US$56–112 million, which is within the range of the economic losses caused by drought to crops. Yield losses have implications for loss of livelihoods, household debt, and food security. The provinces with higher climate hazards are the most productive ones in terms of agriculture, situated in the Mekong River basin, which is concerning for the country's food security. Therefore, climate-resilient agriculture measures that could be adopted at the local level are described below.

Building Earthen Embankments, Dikes, and Drainage

Rationale: Communities relying on agriculture near the sea and on low-lying land are at risk of saline intrusion from the sea and tidal rivers washing inland. This can cause salinization of their crops in extreme tidal events, which not only affects crop production but reduces the fertility of the soil for future cropping. Embankments and dikes can protect coastal land from flooding and sea level rise. Furthermore, embankments built along roads can facilitate travel during floods, protecting access to health services, market inputs, and education.

Best practice: Embankments are a natural complement to reforestation efforts. Embankments can serve the dual purpose of protecting mangrove habitats by separating remaining mangroves from land used for agriculture and providing flood protection for hinterland.[9] Where rural infrastructure is in poor condition, building road embankments can raise household incomes by improving transportation networks to markets and services. (Dasgupta et al. 2017). One CCA project in Bangladesh demonstrated a new approach.[10] The building block for this model is the preparation of ditches and dikes in the uncultivated land between embankments and mangrove forests. The ditches are used for irrigation and freshwater fish cultivation, while fast-growing fruit trees and vegetables are planted on top of dikes. The vegetables, fruit, and aquaculture provide a seasonal stream of income while also supporting land renovation and disincentivizing mangrove deforestation. In Bangladesh, this model has been targeted toward landless households, allowing them to sign a 10-year lease to cultivate the area.

Because they are meant to withstand extreme events, using climate projections is vital in the design of embankments—yet still surprisingly uncommon. Some project evaluations admitted that embankment designs were primarily based on current flood risks. One project in Cambodia set a higher standard, however, using projections of sea level rise to 2100 as a barometer for how tall embankments should be built.[11] Using these data, embankments were built 1.3 meters above existing footpath levels, and water gates were upgraded to allow surface flood waters to flow back out to sea. Rather than using conventional vertically hung steel flap valves, which are liable to siltation and debris clogging them, the project used "duck bill" type nonreturn valves in culverts where water can flow back out. Anticipating solid plastic waste blocking the culverts during floods, the project also installed wire debris screens upstream.

Because climate pressures will only continue to threaten coastal infrastructure, local knowledge of maintaining and repairing embankments and dikes is essential for adaptation. Another project in Cambodia, which rehabilitated polder dikes that protected 10,000 hectares of paddy, found that dike repairs would be routinely required post-project implementation.[12] Until communities seek to migrate away from marginal coastal lands, farmers must be able to raise funds for dike maintenance and, where possible, repair infrastructure locally. These needs must be built into the design of projects early on, to avoid project infrastructure falling into disrepair shortly after the project closes.

Expanding and Improving Irrigation Infrastructure

Rationale: As dry seasons lengthen and rainfall becomes more variable, crop failures linked to water shortages are likely to become more common. Investing in irrigation infrastructure enables farmers to move away from rain-fed agricultural production and better cope with these water shortages.

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[9] Project title: Climate Change Adaptation through Protective Small-Scale Infrastructure Interventions in Coastal Settlements of Cambodia.
[10] Project title: Community-Based Adaptation to Climate Change through Coastal Afforestation (Bangladesh).
[11] Project title: Climate Change Adaptation through Protective Small-Scale Infrastructure Interventions in Coastal Settlements of Cambodia.
[12] Project title: Vulnerability Assessment and Adaptation Programme for Climate Change in the Coastal Zone of Cambodia Considering Livelihood Improvement and Ecosystems.

Best practice: Developing irrigation infrastructure is not unique to climate action projects, but one that will become more important for smallholder farmers as they face water shortages in increasingly drought-prone agroecological zones. Irrigation practices introduced in climate change adaptation projects were focused primarily on paddy production, enabling farmers to diversify production and produce two cycles of crops in a year. Rehabilitating and expanding existing canal networks were major components of irrigation projects. Rehabilitating canals served a dual purpose: (i) it expanded access to irrigation during the dry season and (ii) it improved drainage during excessive rains when flooding occurred in farmers' fields. In Cambodia, a project evaluation noted that timing of rehabilitation work was vital to project success. Rehabilitation must be done between cropping cycles to secure water for crops, and soil work should be done during the dry season to prevent sediment from washing into the canals.

When designing the irrigation infrastructure, it is vital to ensure that local communities can get equitable access. Canals are fixed geographically. People who owned fields adjacent to irrigation canals benefited disproportionately compared to those with land further away or landless community members. One report noted that in the catchment area of a rehabilitated canal, only 10 percent of farmers could grow two crops as they were closer to the canal. Those that were 300 meters from the canal were still vulnerable to drought.[13] Therefore, participatory design that is inclusive of all communities could ensure equal benefit distribution of such infrastructure or include specific measures for the households that could not benefit, such as investing in groundwater access for irrigation.

Installation of Rainwater Storage, Water Supply, and Pond Creation

Rationale: Rainwater storage is vital for managing climate variability and periods of water shortage. Communities across Cambodia already experience water scarcity, and this is only projected to increase with hotter temperatures and more unpredictable rainfall. In coastal areas, groundwater becomes more brackish during the dry season, which makes investments in water infrastructure necessary to protect community health.

Best practice: Across the climate action projects reviewed, investments in water supply were lauded as projects' most impactful element for communities. As one project evaluation in Cambodia explained, "Without a doubt, pond creation, water tank supply, and pipelines from catchment sprint waters were believed to contribute most toward the achievement of sustainable project outcomes."[14] Women in particular appreciated improved access to water, as it lessened time spent waiting in queues to collect water and enabled them to irrigate home gardens.

In water scarce areas, providing rainwater harvesting tanks was one simple method of supporting daily consumption, hygienic needs, and vegetable production. Rainwater storage tanks are relatively inexpensive and could be installed by villagers themselves, provided there is enough space and a stable foundation. Furthermore, larger tanks could be installed in common areas to increase public access to safe water during times of water shortage.

[13] See project: Enhancing Climate Change Resilience of Rural Communities Living in Protected Areas of Cambodia.
[14] See project: Enhancing Climate Change Resilience of Rural Communities Living in Protected Areas of Cambodia.

Building ponds is a traditional Southeast Asian method to conserve water in the rainy season. They may not always have sufficient water quality for drinking because they are easily contaminated, but they can support households to grow vegetables in the dry season and provide water for livestock. A project in Cambodia found that ponds lose 50 percent of water through evaporation during the dry season, so ponds should be built to accommodate twice as much water as needed. Another consistent lesson across providing access to water was the importance of developing systems to cover the costs of operation and maintenance, such as through user fees.

Building Water-Spreading Weirs, Check Dams, and Cascade Dams

Rationale: When more intense drought and floods are combined with significant deforestation along flood channels, floods can cause significant soil erosion. When this occurs, rather than replenishing soil moisture, floods begin to aggravate land degradation processes and convert flood channels into deep gullies (Getnet et al. 2020). Weirs and check dams reduce run off and help retain water in the catchment, improving soil moisture and reducing issues of water shortage. Check dams slow down stream flow and prevent erosion, increase freshwater availability, and recharge groundwater.

Best practice: In sites with significant erosion and land degradation, weirs and check dams featured as a solution to improve soil moisture and reestablish vegetation in flood and drought prone areas. In Thailand, construction of "living weirs" were attributed to increasing water flow throughout the year, benefiting rice fields and ecotourism in the area.15 Along the riverbanks, a combination of Banyan trees and other plants were planted to stabilize soils. The wide rooting banyan trees are planted on both sides of the weir, with hopes that the roots will form a living weir. Working at the watershed level (rather than administrative boundary) is important for successful climate change adaptation. What occurs upstream has consequences for water retention, erosion, vegetation, and livelihoods further downstream. In Cambodia, a project installed in-stream structures such as cascade and check dams so that downstream farmers could water their livestock in the dry season[16] Upstream of dams, community protected areas were established, and community forests were planted to stabilize soil and slow erosion.

Promoting Climate-Smart Agriculture Techniques

Rationale: As climate stresses intensify, traditional methods of farming may no longer yield sufficient harvests to meet household needs. By diversifying into new crops and applying "climate-smart" techniques, farmers will be better placed to adapt to new environmental conditions and protect their crops against climate extremes brought on by climate change.

[15] Project title: Integrated Community-Based Forest and Catchment Management through an Ecosystem Service Approach project.
[16] Project title: Strengthening the Adaptive Capacity and Resilience of Rural Communities Using Micro Watershed Approaches to Climate Change and Variability to Attain Sustainable Food Security.

Best practice: Providing trainings and extension support through farmer field schools featured prominently in climate-smart agriculture projects. Participating in farmer field schools and demonstration trials can help promote farmer-to-farmer learning, which is critical in areas where access to information and markets is limited (Roshetko et al. 2017). In practice, project evaluations often deemed trainings inadequate or found they were not well suited to the agroecological context. These errors were embedded in project design, rather than in the logic of climate-smart agriculture itself.

There are lessons to be drawn from the shortcomings of farmer field school approaches:

1. The agroecological context is crucial to whether climate-smart technologies will be successful. In one project in Cambodia, soil chemistry was ignored when selecting plant species for crop production in the project areas, though a soil study could have been conducted at minimal cost.[17]

2. Adopting climate-smart agricultural technologies requires a change of mindset, which takes time to cultivate. Projects that aimed to develop new mindsets in 18 months were unlikely to see significant uptake.[18] One project evaluation in Vietnam demonstrates this well, with only 10 percent of the target beneficiaries adopting any of the climate resilient livelihood options promoted by the project.[19]

3. Considering farmers' needs before designing farmer field schools is crucial for long-term uptake of technologies. In some cases, the teaching methods were not suited to farmers' preferences. In one project in Cambodia, farmers reported to the evaluation team that many of the farmer field schools were partly held in classrooms, which did not allow for a full "learning by doing" approach. Because they had low levels of literacy, farmers stated they would have preferred direct practical work.[20] In another project in Cambodia, trainings were wholly focused on encouraging farmers to adopt System of Rice Intensification technology, which was significantly more labor intensive than traditional varieties.[21] Though the approach had benefits, the farmers already faced labor shortages and could not afford to spend time leveling land and manually transplanting seedlings.
4. Farmer field schools should be aligned with climate-resilient agriculture approaches. Some examples show that it has not always been the case. For example, one project evaluation found that farmer field schools still focused principally on single commodities, which was not aligned with climate-smart agriculture principles that promote diversification as a key component of resilience.[22]

[17] Project title: Enhancing Climate Resilience of Rural Communities Living in Protected Areas of Cambodia.
[18] Project title: Strengthening the Adaptive Capacity and Resilience of Rural Communities Using Micro-Watershed Approaches to Climate Change and Variability to Attain Sustainable Food Security in Cambodia.
[19] Project title: Integrated Community-Based Adaptation in the Mekong Delta Region (ICAM).
[20] See project: Enhancing Climate Change Resilience of Rural Communities Living in Protected Areas of Cambodia.
[21] Project title: Cambodia Community Based Adaptation Programme (CCBAP).
[22] Project title: Strengthening the Adaptive Capacity and Resilience of Rural Communities Using Micro-Watershed Approaches to Climate Change and Variability to Attain Sustainable Food Security in Cambodia.

4.5 Locally Led Climate Action for Sustainable Forestry

Cambodia's rapid rate of deforestation in the last two decades is both a major driver of emissions and increased vulnerability of forest-dwelling communities. Since 2001, Cambodia has lost 29.5 percent of remaining forest cover, and the impacts of deforestation can undermine community resilience (Pauly, Crosse, and Tosteson 2022). Without the vital ecosystem services provided by old growth forests, people living in areas affected by deforestation face higher flood risk, erosion, and higher temperatures (WBG 2023a). Forests provide benefits such as purifying water, erosion control, and reducing flood risk, which all play an important role in supporting agricultural productivity in the highlands.

Climate actions in Cambodia must include prioritizing small-scale forest users' needs, while reducing deforestation and restoring forests in strategic locations. These initiatives could also support the Cambodia's NDC aspiration to promote the rights of Indigenous people in achieving mitigation measures in the land use sector. There are some examples on sustainable forestry interventions at the local level in Cambodia and beyond that have or could be financed through PBCRG. These interventions need to be scaled up to contribute to Cambodia's Forestry and Land Use sector targets, which aim to reduce historical emissions by 50 percent by 2030 (RGC 2020).

Mangrove Reforestation

Rationale: Mangroves provide a range of ecological and social benefits, but they are most commonly credited with protecting coastal communities against the worst effects of storm surge. They do so by slowing water velocity and attenuating storm surge height between 4 and 16.5 cm (Dasgupta et al. 2017). In addition to the direct damage storm surges cause to infrastructure and homes, they result in saltwater ingress into local agricultural land and surface water, decreasing agricultural productivity (Dasgupta et al. 2017). Mangroves can also combat the effects of coastal erosion by trapping sediment. They provide valuable habitat nurseries for fish, crab, and other wildlife, and coastal communities depend on them for timber, fuel, and food. From a climate mitigation perspective, mangrove forests serve a critical function, storing three times the amount of carbon than an equivalent area of terrestrial forests (Murray et al. 2011).

Best practice: Mangroves are highly sensitive to topography, hydrology, and soil conditions, so reforestation efforts must first consider why forests have not naturally regenerated before moving into planting of mangroves (Lewis 2005). Historically, mangrove planting schemes have often prioritized short-term increases in area over long-term establishment of mangrove ecosystems (Lee et al. 2019). Though monoculture plantations are convenient and can achieve sufficient tree density more quickly than natural regeneration would allow, the seedlings can suffer from high mortality due to improper soil conditions (Kodikara et al. 2017). Another approach, known as "ecological mangrove restoration," has higher survival rates but is more demanding in terms of coastal engineering requirements (Ellison, Felson, and Friess 2020). Under an ecological mangrove restoration approach, intertidal zones are regraded, dredged, and filled so that the biophysical conditions are within tolerable limits for mangrove establishment, growth, and reproduction. NGOs such as Wetland International and Mangrove Action Project have developed community-based ecological mangrove restoration approaches.

Supporting Community Forestry

Rationale: In addition to the mitigation services they offer through carbon storage, forests act as a buffer against disasters, such as floods and landslides. Because they protect watersheds, changes in forest cover can have negative downstream effects, such as reduced water yield (Sikor et al. 2013). For communities that live around forests, they provide a key source of food and income.

Best practice: Community forestry is an approach to forestry management in which local people participate in regulating and protecting their forests. While plantations are harvested for a single product, community forests can have a range of benefits, depending on what is prioritized by the community—improving local livelihoods, reducing deforestation, supplying food, meeting spiritual or cultural needs, and providing subsistence-based timber (Sikor et al. 2013). Whereas bottom-up management decisions are best made at the community level, climate action projects should encourage project management staff to secure top-down institutional buy-in early on in implementation. In Cambodia, community forestry efforts were successful partially because the project included thorough assessments of land tenure and field appraisal of boundaries to facilitate official registration of the Community Protected Areas (CPAs).[23] CPAs are currently being implemented through the World Bank-financed programme, Cambodia Sustainable Landscape and Ecotourism Project.

To sustain communities' interest in community forestry, protecting forests should be linked to wider environmental outcomes. Community forests may not appear to have any immediate benefits to communities, which may incentivize beneficiaries to resume unsustainable practices. To address this concern, community forestry is often implemented in conjunction with efforts to diversify livelihoods, but this must be carefully designed to replace the income lost from unsustainable forestry practices. The Cambodia Sustainable Landscape and Ecotourism project aims to do this by promoting non-timber forest product value chains, including extraction of rattan and resins, collection of fruits, cardamom, and medicinal plants, and processing of vegetable oils. Some projects in Cambodia promoted vegetable gardens as an on-farm alternative livelihood activity. The gardens enabled some income generation, particularly for women.[24] An evaluation of a Cambodian Community Forestry initiative recommended linking efforts to landscape-level conservation. This could be done by demonstrating the relationship (to local communities) between sustainably managed forests and improved conditions within the catchment area—particularly in local water supply.

[23] Project title: Collaborative Management for Watershed and Ecosystem Service Protection and Rehabilitation in the Cardamom Mountains, Upper Prek Thnot River Basin.
[24] Project title: Collaborative Management for Watershed and Ecosystem Service Protection and Rehabilitation in the Cardamom Mountains, Upper Prek Thnot River Basin.

Promoting Agroforestry Practices

Rationale: Soil erosion, flooding, and pollution are common environmental problems in highland farms in Cambodia (Roshetko et al. 2017). In agroforestry, trees are planted on farms to provide shade, act as a windbreak, and bind erosive soils for adjacent crops (Neufeldt et al. 2011). These practices are designed to support farmers to adapt to land degradation and climate stresses. In places where there is competition between agriculture and forests, agroforestry offers a way to increase agricultural productivity while also deliberately planting trees to store carbon and protect the environment's ecological functions (Mbow et al. 2014).

Best practice: Like community forestry, agroforestry is not a technical recipe, but an approach that can take different forms depending on the socioeconomic and biophysical context (Altieri 2016). The basic premise is to imitate natural biodiversity as much as possible, promoting agroecosystem function like nutrient cycling, pest regulation, and productivity. The practice of agroforestry is designed to be intentional—trees and crops are combined and managed to create benefits that cannot be obtained if each component is cultivated separately (Mulia and Nguyen 2021). In Asia, there are industrial-tree crop agroforestry systems, that cultivate rubber, coffee, tea, and cacao; fruit tree-based systems that produce mangos, limes, or bananas; mangrove agroforestry systems that combine mangroves with rice or shrimp cultivation; and systems that combine timber trees with annual crops (Mulia and Nguyen 2021).

Agroforestry initiatives proved to be effective across a range of studies and circumstances at reducing risk and improving socioeconomic and environmental conditions (Owen 2020). One such example of a successful initiative was a rubber-based agroforestry project in the Philippines. The project increased household income, primarily through farmer cooperatives that enabled access to credit, insurance, and discounts on goods (Furoc-Paelmo et al. 2018). It also demonstrated how intercropping fruit trees reduced the occurrence of pests and disease, increased yields, improved soil quality, and diversified income sources. Agroforestry can also have an important role in mitigating the impact of climate stress. Studies find that agroforestry practices help smallholder farmers mitigate the impacts of droughts (Tran and Brown 2019) and enhance households' ability to recover from natural hazards more quickly in Vietnam (Simelton, Dam, and Catacutan 2015). To encourage communities' uptake, it is important to carefully assess the agroforestry system's ability to generate a minimum annual income to community, its suitability with the soil, and how demanding the system would be in terms of labor and costs (Simelton, Dam and Catacutan 2015). Where land tenure is uncertain, securing tenure rights is another important step to encourage uptake (Roshetko et al. 2017).

Erosion Control through Vegetation Restoration

Rationale: Slope stabilization is a high priority in mountainous regions, as highland provinces are vulnerable to storms and flash floods that could cause devastating landslides. Rural infrastructure is regularly damaged in storm events and this vulnerability is heightened in areas with significant deforestation.

Best practice: In isolated highland villages in southeast Asia, most existing infrastructure was developed without taking into account flood and storm risks. In the highlands of Vietnam and Laos, climate adaptation projects focused on making rural infrastructure more climate resilient, protecting rural people's mobility and access to essential services. These efforts relied on ecosystem-based adaptation measures, in which rehabilitating natural vegetation and applying bioengineering methods were combined with infrastructure development. The utility of this approach is not limited to highland areas; a coastal project in Bangladesh also applied bioengineering technologies like planting vetiver grass for road slope protection along embankments, but adapted so that grasses could thrive in saline soil.[25]

4.6 Locally Led Climate Action for Energy

Decentralized Renewable Energy Systems

Rationale: Large-scale and on-grid renewable systems may not be feasible in energy poor remote areas of Cambodia where geographical challenges preclude grid-based solutions. Using off-grid renewable systems can both lower emissions and bring myriad economic benefits. In small-scale solar projects supported through UNDP and the Ministry of Mines and Energy in Cambodia, the off-grid systems reduced energy costs from 30,000 riels/month to 10,000/riels a month (Socheata 2021). Decentralized energy systems are also more resilient than centralized systems; centralized energy systems are highly vulnerable to climate stresses like storms that may damage powerlines. In Puerto Rico, households with solar panels recovered more quickly from hurricane damage than their neighbors who were dependent on the centralized grid (Baker 2021).

Best practice: To ensure maintenance of solar grid systems, it is vital to invest in institutional capacity at the local level. In Kampong Chhnang province, where UNDP invested in decentralized solar energy systems, solar community-based management committees were trained to help service the micro-grid system.[26] The company that was contracted to supply and install the mini grid has a contractual arrangement for operations and maintenance that helps the community gain technical support and identify issues with the mini-grid. The project evaluation also identified the importance of community bylaws for the functionality and sustainability of the systems. Installation of solar energy at the local level can have positive impacts on other elements of climate resilience. For example, solar energy was installed not only for households and community lighting but also for solar water pumps in the Kulen National Park and the Tonle Sap tree nursery in Cambodia, benefiting forest conservation efforts (GEF 2021). Mini- or micro-grids can service multiple community resilience needs at once, and VRAs can identify where renewable technologies could be used for purposes beyond household energy access.

[25] Project title: Coastal Climate-Resilient Infrastructure Project (Bangladesh).
[26] Project title: Building an Enabling Environment for Sustainable Development, Cambodia.

Clean Cooking Solutions

Rationale: The promotion of clean cooking can mitigate damage to forest ecosystems. Firewood accounts for 44 percent of total final energy consumption in Cambodia, which drives forest degradation (World Bank 2023a). Furthermore, cooking on firewood also has severe impacts on health; it is responsible for 123 annual deaths per 100,000 people in Cambodia (World Bank 2023a). In addition to reducing morbidity of all household members involved, using clean cooking solutions can save women's time in collecting and preparing firewood and cooking (Dave et al. 2018). The Government of Cambodia's Ministry of Mines and Energy is currently receiving technical advice on clean cooking solutions through the World Bank's Advisory Services and Analytics.

Best practice: Because most policies and programs to encourage uptake of clean cooking technologies in Asia are top down, understanding the primary reasons people accept or would not accept a new stove is an essential starting point (Farabi-Asl et al. 2019). Cost, cultural factors, time, ease, and practicality all play a significant role in whether or not a household chooses to use a clean cooking stove. For long-term sustainability and uptake, the behavioral aspects of household cooking choices are as important as market and economic factors. Wherever possible, clean cooking programs should look to promote renewable, domestic sources of energy. In places with access to the electricity grid, cooking with electricity is an option that will become greener, as Cambodia increases the share of renewables in power generation to meet the aims of its NDC.[27]

[27] Currently, the electricity tariff in Cambodia is higher than that of other nations in the region, which remains a barrier that dissuades people from using electricity for cooking (Dave et al. 2018).

CHAPTER 5.

Conclusion

Over the last 10 years, the RGC and its development partners have built an institutional mechanism to deliver finance to incentivize local climate action. Working with NCDD-S offers great potential to expand a decade of efforts, particularly through PBCRG, to invest in enhancing local governments' capacity to be more responsive to the climate priorities of their constituents and improve local climate resilience through climate-smart investments (e.g., climate-resilient infrastructure, climate-smart agriculture, among others). As financing for the program has mostly been in pilot projects, there is currently a high need for more investment in climate action at the local level. Exposure to climate change is growing, and more investment at the commune and inter-commune level is a vital step to mitigate the impacts of the climate crisis on Cambodia's poor and improve the capacity of local governments to understand and respond to climate vulnerabilities.

The commune/sangkat fund (C/S Fund) is an important instrument for enabling local climate action. To date, subnational governments in Cambodia have invested over US$2,873,305 directly from C/S Fund to incentivize climate-smart investments through the PBCRG. They have also engaged with a variety of other poverty reduction and climate resilience programs, including the World Bank's LEAP project, the GEF's Small Grants Program, amongst others (see section 3.4). These projects and pilots demonstrate the potential of undertaking climate action at the commune level, strengthening local development plans, investing in SNAs' capacity to understand vulnerability and climate risk, and enabling local people to have more say over their needs to confront climate change in their communities.

However, the report finds that such a mechanism can be further strengthened and expanded to bring impacts at scale. Most climate investments supported by PBCRG have focused on building small-scale physical infrastructure. Investments in irrigation infrastructure comprise the lion share at 76 percent of PBCRG investments, followed by transportation infrastructure (19 percent) of the measures taken, primarily to build flood resilient roads. Only 5 percent of the remaining investments are focused on training, raising awareness about climate change and disaster risk, and livelihood supports. While investing in physical infrastructure could address climate risks, broader investments are needed to enhance overall communities' resilience against climate shocks. To enable more comprehensive climate risk management climate finance should also be channeled to more diverse measures that are necessary for local economic growth and development. Moreover, the mechanism also needs to be scaled up in terms of geographical coverage to bring substantial impacts to enhance climate resilience in the country. The current coverage remains limited, given the pilot nature of the projects.

To complement investments in climate resilience at the local level, this report highlights the importance of investing in building the capacity of local governments and communities for climate resiliency planning. Physical infrastructure is best supported by social infrastructure—that is, local institutions that can better understand and plan for climate risk and facilitate collective decision making. Doing so while reinforcing government linkages between the commune/sangkat level and the district and provinces can better enable climate action at multiple government levels and make investments more sustainable.

Currently local climate planning is overly focused on the narrow range of physical investments available through PBCRG, rather than a comprehensive analysis of what types of services, social structures, livelihood skills, and infrastructure might better support people's ability to cope with climate extremes.

To expand climate action at the local level, this study offers the following recommendations:

1. Enhance sectoral coordination and collaboration to mainstream and support local climate resilient planning.
   - Engage line ministries and draw on their technical expertise and support at the local level to feed into CIP and PBCRG investments. This could be done by reviving and strengthening an existing national technical working group to accelerate locally led climate action.
   - Ensure the range of potential local climate smart investments are aligned with the national and sectoral climate change action plans and NDC.

2. Strengthen local governance systems and capacity for climate resilient planning.
   - Build the capacity of subnational administrations (SNAs) and communities to integrate climate risk assessment to inform local climate smart development plan and implementation. District and commune-level administrations would benefit from more tailored advice about how climate change impacts communities' socioeconomic situation, as the current focus of C/S Fund prioritizes physical infrastructure investment rather than building social resilience against climate shocks.
   - Enhance communities' capacity to participate meaningfully in commune development plan and budgeting process and institutionalize participatory and inclusive approaches in planning and monitoring.
   - Enhance digital governance, service delivery, and accountability in local climate actions.

3. Improve and scale up incentive mechanisms for local climate actions.
   - Mobilize climate finance via public, multilateral, and private finance for sustaining and expanding incentive mechanisms for local climate action.
   - Consider modifying current institutional set up to borrow from best practice of Kenya County Climate Change Funds governance model, which allocates funding at different levels governance and coordinates between relevant stakeholders at the subnational level.
   - Enhance performance indicators to include measures that reflect the fact that SNAs have internalized capacity-building measures related to climate risk assessment, use of climate data, and adopting inclusive measures. It is also crucial to remove indicators that can unfairly penalize administrations for delays in transferring finance that are beyond their control.
   - Develop an option for medium-sized grants that can combine climate action needs across two or more sangkat/communes, enabling climate-resilient investments that can operate at landscape level in places where common vulnerabilities are best addressed by investments at the inter-commune level..

4. Improve public access to data and analysis on climate risks and vulnerability and adaptation resources.
   - Update and enhance the national climate vulnerability map and make it accessible to subnational government administrations and communities to inform local development planning.
   - Complement climate change projection data with examples of clear, actionable information about the implications of these projections across livelihoods and geographies and potential adaptation measures.

5. Improve quality of local climate smart investments
    - Enhance the standard operational procedure of small-scale infrastructure investments to be climate resilient and ensure its effective implementation.
    - Integrate social and equity consideration when investing in infrastructure to ensure equitable spread of benefits. For example, complement irrigation infrastructure with small-scale pumping from groundwater or small reservoirs for households located further away to ensure an equitable spread of benefits.
    - Expand investments to enhance socio-economic resilience, such as sustainable livelihood and vocational trainings, support for community enterprises and saving groups, among others.

ANNEX 1.

PBCRG Projects in Cambodia

PROJECT NAME	DATES	IMPLEMENTING PARTNER	GEOGRAPHIC COVERAGE	GRANT RECIPIENTS	TOTAL BUDGET (US$)	RELEVANCE
NAPA-Follow Up (NAPA FU)	2010–13	UNDP, MAFF	2 provinces	NGOs / CBOs	2,646,318.22	One of the first projects to use PBCRGs
Small Grants Programme (SGP), component of the CCBAP	2010–ongoing	UNDP-UNOPS	N/A	NGOs / CBOs	N/A, ongoing program	SGP piloted the support to local organizations to mainstream climate change adaptation in CIPs/development plans and has broad experience with livelihood initiatives at community level.
Community-based Adaptation Programme (CCBAP)	2010–15	UNDP	113 communes, 59 districts, 21 provinces	NGOs / CBOs	2,588,000	Between 2010 and 2013, the Cambodia Community Based Adaptation Programme (CCBAP) supported CIPs through NGOs.
Scale Up Climate Change into Sub- National Planning and budgeting process (SNC Scale Up project)	2013–17	NDCC, UNDP	49 communes and 5 districts in Battambang, Takeo and Preah Vihear provinces.	Not grant based	Not available	Project aims to scale up the integration of community-based adaptation into subnational planning and budgeting process following the lessons from the on-going climate change interventions.
Reducing the vulnerability of Cambodian rural livelihoods through enhanced subnational climate change planning (SRL)	2016–20	GEF-LDCF, RGC	10 target districts in 89 communes of Siem Reap and Kampong Thom provinces	Districts/ communes	4,567,500	PBCRG modality - Project aims to improve SNA systems through climate sensitive planning, budgeting, and execution. Includes investments in small-scale water management infrastructure and technical assistance for resilient agriculture practices.
ASPIRE, ASPIRE-AT	2014–27	IFAD	N/A	Communes and now producers organizations	ASPIRE - 86,250,000 ASPIRE-AT – 194,000,000 (over 7 years)	PBCRG modality - Supported further piloting of PBCRG which mainly focuses on agriculture sector. Funds go to producers organizations rather than through district/commune.

PROJECT NAME	DATES	IMPLEMENTING PARTNER	GEOGRAPHIC COVERAGE	GRANT RECIPIENTS	TOTAL BUDGET (US$)	RELEVANCE
SRELFOOD-II	2021–22	WFP, NCDD	Kampong Chhnang, Pursat, Battambang and Kampong Thom provinces	Communes	1,202,761.27	PBCRG modality - The project provided training to provincial, district, and commune officials on integrating climate change adaptation into commune development plans and commune investment funds and to support commune investment projects in three communes, one in each of the following provinces: Kampong Thom, Siem Reap, and Kampong Chhnang
LGCC, LGCC-II (Local Governments and Climate Change)	2011–20	UNCDF, NDCC	Takeo and Battambang provinces	Districts/ communes	LGCC I: 640,000 allocated for PBCRG, full budget unavailable. LGCC II: 2,288,287	PBCRG modality - The LGCC was the original pilot project for PBCRG and has been implemented in two phases. A third phase is pending.
LGCC-III (Local governments and climate change)	Pending	NDCC-S	15 districts	Districts/ communes	14,000,000 (GCF finance, not including government cofinancing)	In this iteration, the project is managed by NDCC-S LGCC-III will be managed by the NCDD-S

ANNEX 2.

Overview of Ongoing Climate Change Projects in Cambodia

	PROJECT TITLE	TIME FRAME	BUDGET	FUNDERS	IMPLEMENTING AGENCY	KEY PARTNER
1	Local Governments and Climate Change (LGCC-3)	Proposed, not yet approved	10,000,000 (indicative budget)	GCF, UNCDF	NCDD-S	NCSD, MoE
2	Cambodia Climate Change Alliance (CCCA) Phase III	2019–2024	9,414,842	EU, Sida, UNDP	MoE	UNDP
3	Cambodia Horticulture Advancing Income and Nutrition (CHAIN)	2014–22	10,000,000	SDC	SNV	
4	Integrated Natural Resources Management Project	2020–25	10,000,000	GEF	MoE	
5	Enhancing Integrated Water Management and Climate Resilience in Vulnerable Urban Areas of the Mekong River Basin	2021–25	1,764,277	Korea	MoWRAM	UNDP
6	Combatting Marine Plastic Litter in Cambodia	2020–23	2,458,414	Japan	UNDP	UNDP
7	Policy and Innovation Hub for Sustainable Development	2019–23	13,217,673	UNDP	UNDP	
8	Forest Carbon Partnership Facility REDD+ Readiness Project Phase II (FCPF-II)	2017–22	6,374,739	UNDP	UNDP	MoE
9	The Biodiversity Finance Initiative (BIOFIN) in Cambodia	2018–23	500,000	Norway	UNDP	
10	Promoting the Use of Solar Technologies for Agricultural and Rural Development in Cambodia	2020–23	2,230,822	Korea	UNDP	NCDDS
11	Promotion of Sustainable Energy Practices in the Garment Sector in Cambodia	2020–24	3,170,730	EU, SWITCH Asia	GERES, (GMAC)	
12	Agricultural Services Programme for Innovation, Resilience and Extension (ASPIRE)	2014–22	86,250,000	IFAD, RGC	MAFF, SNEC, NCDDs	
13	Accelerating Inclusive Markets for Smallholders (AIMS)	2017–23	46,000,000	IFAD, RGC	Ministry of Commerce	
14	Sustainable Assets for Agriculture Markets, Business and Trade (SAAMBAT) project	2019–25	142,170,000	IFAD, EIB	MAFF	MEF

	PROJECT TITLE	TIME FRAME	BUDGET	FUNDERS	IMPLEMENTING AGENCY	KEY PARTNER
15	Tonle Sap Poverty Reduction and Smallholder Development Project	2009–23	12,130,000	IFAD	MAFF	MOI
16	Access and Benefit Sharing	2019–22	1,242,166	UNDP	NCSD	
17	Developing a Comprehensive Framework for Practical Implementation of the Nagoya Protocol	2019–22	2,804,304	GEF, RGC	MoE	UNDP
18	Food Security and Community-based Recovery Support to Flood-affected Communities in Cambodia (SRELFOOD2)	2021–22	1,202,761	GEF, WFP	NCDDS	WWF
19	Sustainable Coastal and Marine Fisheries Project	Proposed	50,000,000	ADB	MAFF	
20	GMS Cross-Border Livestock Health and Value Chains Improvement Project	Proposed	12,000,000	ADB	MAFF	
21	Energy Transition Sector Development Program	Proposed	51,000,000	ADB	MAFF	MME
22	Investment in New Forests Tropical Asia Forest Fund 2 L.P	Proposed	15,000,000	ADB	Regional	
23	Climate Resilient Rice Commercialization Sector Development Program (Additional Financing)	Approved	3,800,000	ADB	MEF	
24	Prime Road National Solar Park Project	Approved	16,400,000	ADB		
25	De Heus Sustainable and Inclusive Feed Supply Chain Project	Approved	15,000,000	ADB	De Heus Animal Nutrition BV.	
26	Climate Resilient Rice Commercialization Sector Development Program	2013–23	79,100,000	ADB	MEF	
27	Tonle Sap Poverty Reduction and Smallholder Development Project - Additional Financing (TSSD- AF)	2017–23	99,000,000	ADB	MAFF	MOI
28	Southeast Asia Agriculture, Natural Resources and Rural Development Facility – Phase II	2020–25	13,725,000	ADB	Regional	
29	Irrigated Agriculture Improvement Project	2019–25	123,260,000	ADB	MoWRAM	
30	Greater Mekong Subregion Sustainable Agriculture and Food Security Program	2019–25	5,500,000	ADB	Regional	

	PROJECT TITLE	TIME FRAME	BUDGET	FUNDERS	IMPLEMENTING AGENCY	KEY PARTNER
31	Greater Mekong Subregion Climate Change and Environmental Sustainability Program	2019–25	7,000,000	ADB	ADB	
32	Developing Partnerships for Knowledge Sharing on Natural Capital Investment in the Yangtze River Economic Belt	2019–22	225,000	ADB	ADB	
33	Empowering Developing Member Countries to Use Multispectral Satellite Images and Artificial Intelligence for Land Use and Coastal Planning	2020–23	1,250,000	ADB	ADB	
34	Climate-Friendly Agribusiness Value Chains Sector Project	2019–26	130,000,000	ADB	MAFF	
35	Agricultural Value Chain Competitiveness and Safety Enhancement Project	2020–27	103,000,000	ADB	MAFF	MEF
36	Southeast Asia Agriculture, Natural Resources and Rural Development Facility	2018–23	8,600,000	ADB	Regional	
37	Cambodia Sustainable Livelihood for Indigenous Communities Project (CSLICP)	2021–25	2,750,000	WB	Analyzing Development Issues Centre (ADIC)	
38	Cambodia Road Connectivity Improvement	2020–27	10,000,000	WB	MPWT	MRD
39	Land Allocation for Social and Economic Development Project III	2020–26	93,000,000	WB	MLMUPC	MAFF
40	AF Cambodia Sustainable Landscape and Ecotourism Project	2020–25	4,420,000	WB	MoE	MRD
41	Cambodia Sustainable Landscape and Ecotourism Project	2019–25	50,660,000	WB	MOE	MRD
42	Cambodia Nutrition Project	2019–24	15,000,000	WB	MoH	NCDDS
43	Water Supply and Sanitation Improvement Project	2019–24	55,000,000	WB	MISTI	MPWT
44	Cambodia Agricultural Sector Diversification Project	2019–25	101,670,062	WB	MAFF	MEF, MRD, MOWRAM
45	Road Asset Management Project II Additional Financing	2018–	113,000,000	WB	MPWT	
46	Cambodia Southeast Asia Disaster Risk Management Project	2017–23	62,500,000	WB	MEF	MRD
47	KH - Livelihood Enhancement and Association of the Poor Project (LEAP)	2017–22	22,170,000	WB	MAFF	MOI

	PROJECT TITLE	TIME FRAME	BUDGET	FUNDERS	IMPLEMENTING AGENCY	KEY PARTNER
48	KH - Road Asset Management Project II	2016–26	64,800,000	WB	MPWT	
49	Mekong Integrated Water Resources Management Project-Phase III	2016–22	16,500,000	WB	CNMC	
50	Cambodia Southeast Asia Disaster Risk Management Project 2	Proposed	169,400,000	WB	MRD	
51	Cambodia: Solid Waste and Plastic Management Improvement Project	Proposed	60,000,000	WB	MPWT	MoE, MOI
52	Water Supply and Sanitation Acceleration Project	Proposed	100,000,000	WB	MPWT	
53	Cambodia Nutrition Project - II	Proposed	9,500,000	WB	NCDDS	
54	GMS Power Trade Project	Proposed	0	WB		
55	Cambodia Water Security Improvement Project	Proposed	0	WB	MoWRAM	MAFF
56	Cambodia Growth and Resilience Development Policy Operation Series	Proposed	200,000,000	WB		
57	CAPFISH Capture - Post Harvest Fisheries Development	2019–24	17,850,000	EU	UNIDO	MAFF
58	Climate Adaptation and Resilience in Cambodia's Coastal Fishery Dependent Communities	2021–25	4,350,000	LDCF	FAO	MAFF
59	Cambodia Programme for Sustainable and Inclusive Growth in the Fisheries Sector: Capture component (CAPFISH Capture)	2019–24	20,054,944	EU	FAO	MAFF
60	Strengthening capacity in the agricultural and land use sectors for enhanced transparency in implementation and monitoring of Cambodia's Nationally Determined Contribution (NDC)	2019–22	863,242	GEF	FAO	
61	Strengthening the enabling environment to promote innovative approaches to Sustainable Forest Management	2020–22	366,000	FAO	FAO	
62	UNREDD-Technical Assistance for Sustainable Forest Trade in Lower Mekong Region	2020–22	1,186,802	Norway	FAO	MoE
63	EmPower: strengthening human rights and gender equality through climate change action and disaster risk reduction	2018–22	1,000,000	UN	UN Women	

Source: Bann and Chun 2022.

ANNEX 3.

List of Regional Climate Action Project Evaluations

Projects were selected based on relevance of the intervention (community-based climate action/developing small-scale infrastructure) and availability of mid-term and terminal evaluations. There were other GEF/climate finance-funded projects within the region that were relevant but were not included because implementation was not sufficiently advanced to have publicly available evaluations.

	FUNDER	GEF ID #	PROJECT TITLE	LOCATION	ECOSYSTEM	IMPLEMENTING AGENCY
1	Adaptation Fund	N/A	Climate Change adaptation through protective small-scale infrastructure interventions in coastal settlements of Cambodia	Cambodia	Coastal / River	UN Habitat
2	Adaptation Fund	N/A	Adaptation Initiative for Climate Vulnerable Offshore Small Islands and Riverine Charland in Bangladesh	Bangladesh	Coastal	UNDP
3	Adaptation Fund	N/A	Enhancing the resilience inclusive and sustainable eco-human settlement development through small scale infrastructure interventions in the coastal regions of the Mekong Delta in Viet Nam	Vietnam	Coastal	UN Habitat
4	Adaptation Fund	N/A	Enhancing Climate Resilience of Rural Communities Living in Protected Areas of Cambodia	Cambodia	Forest	UNEP
5	Adaptation Fund	N/A	Addressing Climate Change Risks in Water Resources and Food Security in the Dry Zone of Myanmar	Myanmar	Dry Zone	UNDP
6	Special Climate Change Fund	3103	Promoting Climate Resilient Infrastructure in Northern Mountain Provinces of Vietnam	Vietnam	Highlands	Asian Development Bank
7	GEF/ CIDA/ UNDP	3867	Promoting Climate-Resilient Water Management and Agricultural Practices in Rural Cambodia	Cambodia	Various	UNDP
8	AusAid / Sweden	N/A	Cambodia Community Based Adaptation Programme (CCBAP)	Cambodia	Various	UNDP
9	LDCF	3890	Vulnerability Assessment and Adaptation Programme for Climate Change in the Coastal Zone of Cambodia Considering Livelihood Improvement and Ecosystems	Cambodia	Coastal	UNEP

	FUNDER	GEF ID #	PROJECT TITLE	LOCATION	ECOSYSTEM	IMPLEMENTING AGENCY
10	GEF Trust Fund	2751	SFM Rehabilitation and Sustainable Use of Peatland Forests in South-East Asia	Indonesia, Malaysia, Vietnam, Philippines	Peatland Forests	IFAD
11	SCCF	3299	Strengthening the Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events	Thailand	Coastal	Thai Red Cross Society
12	GEF Trust Fund	3445	SFM Strengthening Community Based Forest and Watershed Management (SCBFWM)	Indonesia	Forest	UNDP
13	GEF	4033	Integrated Community-based Forest and Catchment Management through an Ecosystem Service Approach Project	Thailand	Forest; varied between coastal and uplands	National Implementation Modality, MONRE (Government)
14	GEF	4554	Effective Governance for small-scale rural infrastructure and disaster preparedness in a changing climate	Laos	Not stated	UNDP
15	GEF Trust Fund	4034	Improving the Resilience of the Agriculture Sector in Lao PDR to Climate Change Impacts	Laos	Varied	UNDP
16	LDCF	4945	Collaborative Management for Watershed and Ecosystem Service Protection and Rehabilitation in the Cardamom Mountains, Upper Prek Thnot River Basin	Cambodia	Uplands	National Implementation Modality
17	Adaptation Fund	N/A	Community Adaptation for Forest-Food Based Management in Saddang Watershed Ecosystem	Indonesia	Coastal	Partnership for Governance Reform (Kemitraan) of Indonesia
18	LDCF	4434	Strengthening the Adaptive Capacity and Resilience of Rural Communities Using Micro Watershed Approaches to Climate Change and Variability to Attain Sustainable Food Security	Cambodia	Not Stated	FAO
19	USAID/ OFDA	N/A	Disaster Risk Reduction for Safe and Resilient Burmese Coastal Communities	Myanmar	Coastal	UN-Habitat

	FUNDER	GEF ID #	PROJECT TITLE	LOCATION	ECOSYSTEM	IMPLEMENTING AGENCY
20	AusAid	N/A	Integrated community-based adaptation in the Mekong Delta Region (ICAM)	Vietnam	Riverine and Coastal	CARE
21	EU	N/A	Development and Scaling Up of a Climate Change Community-Based Adaptation (CC CBA) Model for Food Security in Thailand Project	Thailand	Low Hills, Riverlow lands	Oxfam
22	Strategic Climate Fund / ADB	N/A	Coastal Climate-Resilient Infrastructure Project	South-west Bangladesh	Coastal	Local Government Engineering Department
23	DFID	N/A	Building Resilience Against Climate Extremes and Disasters (BRACED)	Myanmar	Dry Zone	Action Aid
24	SIDA and UNDP	N/A	Building an Enabling Environment for Sustainable Development	Cambodia	Highlands	UNDP / MME

ANNEX 4.

Timeline for Budget Preparation for SNAs

TIME	ACTIVITY	DESCRIPTION
March, April, May	Development of budget strategic plan	Based on guidelines issued by Minister of Economy and Finance, all ministries, institutions, and entities inform their council about budget projections in their sector that need to be implemented The governor of SNAs submits the plan to the Department of Economy and Finances, to be consolidated and submitted to Ministry of Economy and finance by May 15.
June, July, August, September	Preparation of budget	In first week of June, Minister of Economy and Finance instructs SNAs on budget plan preparation through a circular, which specifies formats, procedures, and supporting documents to detail revenue and expenditure plans. By June 30, the Governor of SNA holds public meeting to disclose budget plan and collect feedback. By July 15, provincial governor submits the plan that the Department of Economy and Finance have consolidated from budget plans of their province, municipality, and districts.
October, November, December	Adoption of the budget	In the first week of October, the Ministry of Economy and Finance submits budget plan of the SNAs. These plans are submitted to the Senate in the first week of December, for final endorsement by December 25.

ANNEX 5.

Lessons from the Field: Best Practices for Agro-ecosystem Function

To inform its interventions, the GEF Small Grants Program developed a guidance for agroecosystems. This guidance helps identify which applied practices can set in motion ecological interactions that drive key processes for agroecosystem function. Agroforestry interventions may rely on one or more of these practices.

TECHNIQUE	EXPLANATION
Crop rotations	Temporal diversity in the form of cereal-legume sequences. Nutrients are conserved and provided from one season to the next, and the life cycles of insect pests, diseases, and weeds are interrupted.
Polycultures	Cropping systems in which two or more crop species are planted within certain spatial proximity result in biological complementarities that improve nutrient use efficiency and pest regulation thus enhancing crop yield stability.
Variety mixtures	Incorporating landraces and local varieties mixed with improved ones enhances adaptability to changing soil and climatic conditions and enhances resistance to diseases.
Agroforestry systems	Trees grown together with annual crops in addition to modifying the microclimate, maintain and improve soil fertility as some trees contribute to nitrogen fixation and nutrient uptake from deep soil horizons while their litter helps replenish soil nutrients, maintain organic matter, and support complex soil food webs.
Cover crops and mulching	The use of pure or mixed stands of grass legumes (e.g., under fruit trees) can reduce erosion and provide nutrients to the soil and enhance biological control of pests. Flattening cover crop mixtures on the soil surface in conservation farming is a strategy to reduce soil erosion and lower fluctuations in soil moisture and temperature, improve soil quality, and enhance weed suppression resulting in better crop performance.
Green manures	Those are fast-growing plants sown to cover bare soil. Their foliage smothers weeds and their roots prevent soil erosion. When dug into the ground while still green, they return valuable nutrients to the soil and improve soil structure.
Crop-livestock mixtures	High biomass output and optimal nutrient recycling can be achieved through crop-animal integration. Animal production that integrates fodder shrubs planted at high densities, intercropped with improved, highly productive pastures and timber trees all combined in a system that can be directly grazed by livestock enhances total productivity without need of external inputs.

Source: Altieri 2016.

References

ADB (Asian Development Bank). 2018. *Fiscal Decentralization Reform in Cambodia: Progress over the Past Decade and Opportunities*. Manila: ADB. https://www.adb.org/sites/default/files/publication/479961/fiscal-decentralization-reform-cambodia.pdf.

Alegre, X.E., Z. Stanton-Geddes, S. Aliyev, and V. Bun. 2020. "Analyzing Flooding Impacts on Rural Access to Hospitals and Other Critical Services in Rural Cambodia Using Geo-spatial Information and Network Analysis." Policy Research Working Paper, World Bank, Washington, DC. https://doi.org/10.1596/1813-9450-9262.

Altieri, M.A. 2016. *Developing and Promoting Agroecological Innovations within Country Program Strategies to Address Agroecosystem Resilience in Production Landscapes: A Guide*. New York: GEF Small Grants Programme, United Nations Development Programme. http://agroeco.org/wp-content/uploads/2016/03/GEF-SGP-Guidance-Note.pdf.

API (Advocacy and Policy Institute). 2023. *2021–2022 Commune and District Budget Analysis Report*. Phnom Penh: Advocacy and Policy Institute. https://apiinstitute.org/uploads/Others/API_Budget_Analysis_Report_final-20230926101123.pdf.

Arnold, M., and N. Soikan. 2021. 'Kenya Moves to Locally Led Climate Action'. *World Bank Blogs* (blog). 27 October 2021. https://blogs.worldbank.org/en/nasikiliza/kenya-moves-locally-led-climate-action.

Baker, S. 2021. *Revolutionary Power: An Activist's Guide to the Energy Transition*. Washington, DC: Island Press.

Bann, C., and N. Chun. 2022. *Mid-term Review of Cambodia Climate Change Alliance: Phase 3 (CCCA3)—Final Report*. New York: United Nations Development Programme. https://erc.undp.org/evaluation/documents/download/21708#:~:text=This%20mid%2Dterm%20review%20(MTR,the%20programme%20on%20track%20to.

Coger, Tamara, Ayesha Dinshaw, Stefanie Tye, Bradley Kratzer, May Thazin Aung, Eileen Cunningham, Candice Ramkissoon, et al. 2022. 'Locally Led Adaptation: From Principles to Practice'. *World Resources Institute*. https://doi.org/10.46830/wriwp.21.00142.

Crick, Florence, Ced Hesse, Victor Orindi, Mumina Bonaya, and Jane Kiiru. 2019. 'Delivering Climate Finance at the Local Level to Support Adaptation: Experiences of County Climate Change Funds in Kenya'. Working Paper. Ada Consortium.

Dany, V., and L. Lebel. 2020. "Integrating Concerns with Climate Change into Local Development Planning in Cambodia." *Review of Policy Research* 37 (2): 221–43.

Dasgupta, S., M.S. Islam., M. Huq, Z.H. Khan, and M.R. Hasib. 2017. "Mangroves as Protection from Storm Surges in Bangladesh." Policy Research Working Paper 8251, World Bank, Washington, DC. https://doi.org/10.1596/1813-9450-8251.

Dave, R., S. Keller, B.B. Koo, G. Fleurantin, E. Portale, and D. Rysankova. 2018. *Cambodia Beyond Connections: Energy Access Diagnostic Report*. Washington, DC: World Bank Group. https://documents1.worldbank.org/curated/en/141011521693254478/pdf/Cambodia-Beyond-connections-energy-access-diagnostic-report-based-on-the-multi-tier-framework.pdf.

Ellison, A.M., A.J. Felson, and D.A. Friess. 2020. "Mangrove Rehabilitation and Restoration as Experimental Adaptive Management." *Frontiers in Marine Science* 7 (May): 327. https://doi.org/10.3389/fmars.2020.00327.

Farabi-Asl, H., F. Taghizadeh-Hesary, A. Chapman, S. M. Bina, and K. Itaoka. 2019. "Energy Challenges for Clean Cooking in Asia, the Background, and Possible Policy Solutions." Working Paper 1007, Asian Development Bank Institute, Tokyo. https://www.adb.org/publications/energy-challenges-clean-cooking-asia.

Furoc-Paelmo, R., R.S.A. Cosico, R.E.D. Cabahug, A.K.A. Castillo, A.S.A. Castillo, and R.G. Visco. 2018. "Farmers' Perception on the Sustainability of as a Climate Change Adaptation Strategy in Agusan Del Sur and North Cotobato, Philippines." *Journal of Environmental Science and Management* 21 (1): 45–60.

GEF. 2021. Renewable Energy Technology for Smallholder Farmers. Good Practice Briefs 2021/2. https://www.thegef.org/sites/default/files/publications/GEF_GoodPracticesBriefs_Cambodia_CRA percent20 percent281 percent29.pdf

Getnet, M., T. Amede, G. Tilahun, G. Legesse, M. Gumma, H. Abebe, T. Gashaw, C. Ketter, and E.V. Akker. 2020. "Water Spreading Weirs Altering Flood, Nutrient Distribution and Crop Productivity in Upstream–Downstream Settings in Dry Lowlands of Afar, Ethiopia." *Renewable Agriculture and Food Systems* 7 (S1): S17–S27. https://doi.org/10.1017/S1742170519000474.

Global Center on Adaptation. n.d. "Locally Led Adaptation." https://gca.org/programs/locally-led-adaptation/.

International Water Management Institute (IWMI). 2013. Agricultural Water Management Planning in Cambodia. https://www.iwmi.cgiar.org/Publications/issue_briefs/cambodia/issue_brief_01-awm_planning_in_cambodia.pdf

Kodikara, K.A.S., N. Mukherjee, L.P. Jayatissa, F. Dahdouh-Guebas, and N. Koedam. 2017. "Have Mangrove Restoration Projects Worked? An In-Depth Study in Sri Lanka." *Restoration Ecology* 25 (5): 705–16. https://doi.org/10.1111/rec.12492.

Lee, S.Y., S. Hamilton, E.B. Barbier, J. Primavera, and R.R. Lewis. 2019. "Better Restoration Policies Are Needed to Conserve Mangrove Ecosystems." *Nature Ecology & Evolution* 3 (June): 870–72. https://doi.org/10.1038/s41559-019-0861-y.

Lewis, R.R. 2005. "Ecological Engineering for Successful Management and Restoration of Mangrove Forests." *Ecological Engineering* 24 (4): 403–18. https://doi.org/10.1016/j.ecoleng.2004.10.003.

Mbow, C., P. Smith, D. Skole, L. Duguma, and M. Bustamante. 2014." Achieving Mitigation and Adaptation to Climate Change through Sustainable Agroforestry Practices in Africa." *Current Opinion in Environmental Sustainability* 6 (February): 8–14. https://doi.org/10.1016/j.cosust.2013.09.002.

MoE (Ministry of Environment). 2020. *Cambodia's Updated Nationally Determined Contribution*. Phnom Penh: MoE, National Council for Sustainable Development, Royal Government of Cambodia. https://ncsd.moe.gov.kh/resources/document/Cambodia_NDC_Updated.

Mulia, R., and M.P. Nguyen. 2021. *Diversity of agroforestry practices in Viet Nam*. Hanoi: World Agroforestry (ICRAF).

Murray, B.C., L. Pendleton, W.A. Jenkins, and S. Sifleet. 2011. *Green Payments for Blue Carbon: Economic Incentives for Protecting* Threatened Coastal Habitats. Report NI R 11-04. Durham, NC: Nicholas Institute for Environmental Policy Solutions, Duke University. https://nicholasinstitute.duke.edu/sites/default/files/publications/blue-carbon-report-paper.pdf.

NCDD (National Committee for Sub-National Democratic Development). 2019. *Manual for Performance Based Grants to Sub-National Administrations*. Phnom Penh: NCDD, Royal Government of Cambodia. https://ncdd.gov.kh/wp-content/uploads/2019/07/NCDD-Performance-Based-Grant-Manual_Approval_English-Version.pdf.

NCSD (National Council for Sustainable Development). 2017. *National Action Plan Financing Framework and Implementation Plan*. Phnom Penh: NCSD General Secretariat, Ministry of Environment, Royal Government of Cambodia. https://faolex.fao.org/docs/pdf/cam175148.pdf.

Neufeldt, H., P. Kristjanson, T. Thorlakson, A. Gassner, M. Norton-Griffiths, F. Place, and K. Langford. 2011. "Making Climate Smart Agriculture Work for the Poor." Policy Brief 12, World Agroforestry Centre (ICRAF), Nairobi. https://apps.worldagroforestry.org/downloads/Publications/PDFS/BR11267.pdf.

OECD (Organisation for Economic Co-operation and Development). 2018. "Climate-Resilient Infrastructure: Policy Perspectives." *Environment Policy Paper* 14, OECD, Paris. https://www.oecd.org/environment/cc/policy-perspectives-climate-resilient-infrastructure.pdf.

OECD and UCLG (United Cities and Local Governments). 2022. *2022 Country Profiles of the World Observatory on Subnational Government Finance and Investment*. Paris: OECD; Barcelona: UCLG.

Ostrom, E. 2009. "A Polycentric Approach for Coping with Climate Change." Policy Research Working Paper 5095, World Bank, Washington, DC. https://documents1.worldbank.org/curated/en/480171468315567893/pdf/WPS5095.pdf.

Owen, G. 2020. "What Makes Climate Change Adaptation Effective? A Systematic Review of the Literature." *Global Environmental Change* 62 (May): 102071. https://doi.org/10.1016/j.gloenvcha.2020.102071.

Parsons, L. 2022. "Strategic Environmental Ignorance: Antipolitical Knowledge Gaps from Drought Measurement to Adaptation in Cambodia." *Environmental Science Policy* 136 (October): 261–69. https://doi.org/10.1016/j.envsci.2022.06.011.

Pauly, M., W. Crosse, and J. Tosteson. 2022. "High Deforestation Trajectories in Cambodia Slowly Transformed through Economic Land Concession Restrictions and Strategic Execution of REDD+ Protected Areas." *Scientific Reports* 12 (October): 17102. .

Petzold, Jan, Tom Hawxwell, Kerstin Jantke, Eduardo Gonçalves Gresse, Charlotta Mirbach, Idowu Ajibade, Suruchi Bhadwal, et al. 2023. 'A Global Assessment of Actors and Their Roles in Climate Change Adaptation'. *Nature Climate Change* 13 (11): 1250–57. https://doi.org/10.1038/s41558-023-01824-z.

Phadke, R., C. Manning, and S. Burlager. 2015. "Making It Personal: Diversity and Deliberation in Climate Adaptation Planning." *Climate Risk Management* 9: 62–76. https://doi.org/10.1016/j.crm.2015.06.005.

RGC (Royal Government of Cambodia). 2008. *Law on the Administrative Management of Capital, Provinces, Municipalities, Districts and Khans*. Phnom Penh: RGC. https://seaknowledgebank.net/sites/default/files/KH%20-%20Law%20on%20Administrative%20Management%20(No.%20NS-RKM-0508-017)_0.pdf.

RGC. 2020. Cambodia's Updated Nationally Determined Contribution. Phnom Penh: General Secretariat of the National Council for Sustainable Development, Ministry of Environment, RGC. https://unfccc.int/sites/default/files/NDC/2022-06/20201231_NDC_Update_Cambodia.pdf.

RGC. 2021. "National Program on Sub-National Democratic Development Phase 2 (2021–2030)." Unofficial translation. Phnom Penh: RGC. https://ncdd.gov.kh/wp-content/uploads/2022/03/NP2-SNDD-Approval-EN-1.pdf.

Romeo, L., and L. Spyckerelle. 2003. "Decentralization Reforms and Commune-Level Services Delivery in Cambodia." Case study prepared for the Asian Development Bank and United Nations Capital Development Fund's "Local Government Pro-Poor Service Delivery" workshop, Manila, February 9–13, 2004.

Roshetko, J.M., A.R. Mercado, E. Martini, and D. Prameswari. 2017. "Agroforestry in the Uplands of Southeast Asia." Policy Brief 77, World Agroforestry Centre (ICRAF) Southeast Asia Regional Program, Bogor, Indonesia; Association of Southeast Asian Nations–Swiss Partnership on Social Forestry and Climate Change, Jakarta, Indonesia.

Schipper, E.L.F. 2020. "Maladaption: When Adaptation to Climate Change Goes Very Wrong." *One Earth* 3 (4): 409–14. https://doi.org/10.1016/j.oneear.2020.09.014.

Setyowati, A., F. Pichon, and S. Khan. 2023. "Social Dimensions of Climate Change in Cambodia." Unpublished background paper for *Cambodia Country Climate and Development Report*, World Bank, Washington, DC.

Sikor, T., D. Gritten, J. Atkinson, B. Huy, G.R. Dahal, K. Duangsathaporn, F. Hurahura, et al. 2013. *Community Forestry in Asia and the Pacific: Pathway to Inclusive Development*. Bangkok: Center for People and Forests. https://www.recoftc.org/publications/0000192.

Simelton, E., B. V. Dam, and D. Catacutan. 2015. “Trees and Agroforestry for Coping with Extreme Weather Events: Experiences from Northern and Central Viet Nam.” *Agroforestry Systems* 89 (6): 1065–82. https://doi.org/10.1007/s10457-015-9835-5.

Soanes, M., A. Bahadur, C. Shakya, B. Smith, S. Patel, C. Rumbaitis del Rio, T. Coger, et al. 2021. *Principles for Locally Led Adaptation*. London: International Institute for Environment and Development. https://www.iied.org/10211iied.

Socheata, H. 2021. “Cambodia’s Mismatch of Solar Potential and Energy Harvesting.” Voice of America Cambodia, December 16. https://www.voacambodia.com/a/cambodia-s-mismatch-of-solar-potential-and-energy-harvesting/6356308.html.

Tran, L., and K. Brown. 2019. “The Importance of Ecosystem Services to Smallholder Farmers in Climate Change Adaptation: Learning from an Ecosystem-Based Adaptation Pilot in Vietnam.” *Agroforestry Systems* 93 (October): 1949–60. https://doi.org/10.1007/s10457-018-0302-y.

UNCDF (United Nations Capital Development Fund). 2018. *Mid Term Evaluation: Local Climate Adaptive Living Facility (LoCAL).* New York: UNCDF. https://erc.undp.org/evaluation/documents/download/11626.

UNDP (United Nations Development Programme). 2014. *Practitioner’s Handbook: Implementing the Vulnerability Reduction Assessment*. 2nd ed. Phnom Penh: UNDP.

UNDP. 2020. *Terminal Evaluation of the “Reducing the Vulnerability of Cambodian Rural Livelihoods through Enhanced Sub-national Climate Change Planning and Execution of Priority Actions (SRL) Project*. New York: UNDP.

WBG (World Bank Group). 2023a. *Cambodia Country Climate and Development Report*. Washington, DC: WBG. https://openknowledge.worldbank.org/handle/10986/40467.

WBG. 2023b. “Cost Benefit Analysis of LEAP Investments.” Unpublished, WBG, Washington, DC.


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