« Working Group of the Agricultural Public Development Banks Platform »

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Financing climate change adaptation

Role, challenges, and constraints for PDBs

Glossary:

Adaptation: Adaptation is defined, in human systems, as the process of adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities. In natural systems, adaptation is the process of adjustment to actual climate and its effects; human intervention may facilitate this. (IPCC 2022).

Adaptation costs: Costs of planning, preparing for, facilitating and implementing adaptation measures, including transaction costs (IPCC 2007).

Adaptation gap: The difference between actually implemented adaptation and a societally set goal, determined largely by preferences related to tolerated climate change impacts and reflecting resource limitations and competing priorities (UNEP 2014).

Adaptation limits: The point at which an actor's objectives (or system needs) cannot be secured from intolerable risks through adaptive actions (IPCC 2022)

Adaptive capacity is the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences. (IPCC 2022). This includes the dimensions of human capital, social capital, natural capital, physical capital and financial capital.

Climate change adaptation is the process of human and natural systems adjusting to the actual or expected impacts or effects of climate change. It includes adapting to short-term weather fluctuations, inter-annual variability, and longer-term changes over decades, and it relates to adjustments in behaviors, practices, skill sets, natural processes, and knowledge that anticipate short-, medium-, and long-term changes. (WB, IDB 2019)

Climate resilience is strengthening a system to withstand climate-related shocks or stressors where adaptation and resilience intersect. It constitutes an important and growing subset of building system level resilience to multiple shocks. Climate resilience is the capacity of a system to cope with, or recover from, those effects, while retaining the essential components of the original system. (WB, IDB 2019)

Exposure: The presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected (IPCC 2022)

Maladaptation is related to actions that may lead to increased risk of adverse climate-related outcomes, including through increased GHG emissions, increased vulnerability to climate change, or diminished welfare, now or in the future. Maladaptation is usually an unintended consequence. (WB, IDB 2019)

Resilience is the ability of a human or natural system to withstand the impacts of exogenous shocks and to cope with or rebound from them. The term encompasses the capacity of a system to face multiple shocks and stressors-socioeconomic, market related, climate related-and withstand them. (WB, IDB 2019)

Risk is defined as the potential for adverse consequences for human and ecological systems: Risk= Hazard x Exposure x Vulnerability (Sensitivity x Adaptive Capacity) (IPCC 2022)

Sensitivity is the degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. (IPCC 2022)

Vulnerability is the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. (IPCC 2022)

Foreword

This paper is an introductory and framing document for the next working sessions of the Platform of Public Agricultural Development Banks for Green and Inclusive Food Systems. This working paper will be enriched by the experiences presented by the PDBs and the synthesis of the discussions between the participants during the working session in February 2023.

The February session will be the first of three sessions dedicated to the adaptation finance approach and will focus on introducing the PDBs' approach to adaptation finance, the linkages with public policies to address climate change, the risk management approach, and adaptation-oriented financial products. As a result of the working session, the main constraints and challenges for PDBs will be identified, as well as examples of strategies adopted by PDBs in relation to financing adaptation to CC.

A second session will focus on the tools developed and implemented by PDBs for the identification and management of CC-specific risks (physical, credit and transition risks) as well as monitoring and reporting methods and techniques for climate finance.

Finally, a third session will focus on the action plans and strategies adopted by the PDBs in relation to CC adaptation strategies and the first results that they are able to present in terms of financing and risk mitigation.

I. Context

Despite the commitments negotiated at COP21 in Paris in 2015, **the impacts of a changing climate are being increasingly felt across the globe**. Extreme weather events, changes in precipitation patterns, melting ice caps and glaciers, rising sea levels and the potential for demographic, health and economic instability will affect us in incalculable ways in the near future.

Climate impacts are increasing across the globe. A multi-year drought in the Horn of Africa, unprecedented flooding in South Asia, and severe summer heat and record-breaking droughts across multiple regions of the northern hemisphere, among others, point to mounting and ever-increasing climate risks. According to IPCC, world will face severe climate risks before the end of this century, even under low-emission scenarios.

Climate Stressors and climate risks	Projected Impacts
• Rising temperature and increased heat wave duration • Increased frequency of dry spells • Increased frequency and intensity of heavy rainfall • Sea level rise • Water sources depletion	• Reduced food and cash crops yield due to heat stress. • Reduced food and cash crops yield due to water stress • Damage to crops and land from heavy rainfall; flooding; increased pest disease damage; erosion and waterlogging. • Salinization, waterlogging and inundation of coastal agriculture from sea level rise. • Increased water stress and pressure on water resources for agricultural use

Table 1 Summary of agriculture impacts and vulnerabilities from current and future climate (GCF 2022)

The war in Ukraine, global supply shortages and the global COVID-19 pandemic have all contributed to an evolving energy and food security crisis, with the cost of living as well as inflation surging in many countries across the world.

Ambitious, accelerated action to adapt to climate change is therefore paramount, together with strong mitigation efforts. However, even ambitious investment in adaptation cannot fully prevent climate change related impacts. Climate change is likely to impact the poorest and most vulnerable the hardest, despite most of the responsibility for climate change lying with the wealthier regions and societies.

Adaptation actions remain largely incremental in nature, typically do not address future climate change, and may reinforce existing vulnerabilities or introduce new risks, particularly for the most vulnerable.

The adaptation finance gap in developing countries is likely five to 10 times greater than current international adaptation finance flows and continues to widen. International adaptation finance to developing countries continues to rise, reaching US$28.6 billion in 2020. This represents a 34 per cent share of total climate finance to developing countries in 2020 (UNEP-AGR 2022)

II. Public Policies and Climate Change Adaptation (PDBs´ needs for climate products)

Role of PDBs in financing adaptation

PDBs are key actors in public economic, social, and environmental development policies. In the context of climate change strategies, PDBs are key partners of governments in the implementation of adaptation and mitigation policies in their respective countries.

As is well known, a strategy with quantified targets for GHG emission reductions and investment volumes for climate change adaptation is being formulated by each government of the signatories countries to the Paris Agreement (2015). The action plans or National Determined Contributions (NDCs) and National Adaptation Plan (NAP)are submitted to the COPs and validated by the UNFCCC. Each country nominates a National Designated Authority (NDA) to coordinate the formulation and implementation of projects and programs, at national level, that contribute to national mitigation and adaptation goals.

Every public entity must undergo the changes required by national policy, PDBs are no exception and **must modify their financial and non-financial products to align with national policy and respond to the challenges posed by climate change**.

Several PDBs have already invested in ambitious programs to help finance adaptation to CC. As an example, we can mention the « Tanzania Agriculture Climate Adaptation Technology Deployment Program (TACATDP)[1] »

For agricultural PDBs, close cooperation with their ministries of agriculture, livestock and rural development is essential in ensuring that products and services are aligned with sectoral policies and support programs, adding climate and environmental components where necessary.

Implementation of adaptation actions

The importance of developing funding programs for adaptation to climate change, concentrated in agriculture, water, ecosystems, and cross-cutting sectors, is increasing. However, without a step change in support, adaptation actions could be outstripped by accelerating climate risks, which would further widen the adaptation implementation gap.

Promote the transition to climate-resilient and low-carbon production systems in particular, in the agricultural, livestock and agro-industrial sectors, prioritizing the optimal management of resources, especially water resources, soils and biodiversity.

In coastal areas, exposed to rising sea levels and storms, funding for productive and housing infrastructure is enormous. In all regions, investments to strengthen essential service infrastructure are of great value in increasing the resilience of such infrastructure to severe weather events.

Food security is an important component of the adaptation concept and financing of sustainable food production systems should be a priority in the PDB **to ensure the availability of safe food for rural and urban populations.**

Intensive agriculture based on the intensive use of chemical inputs is an unsustainable production system, highly exposed to climate risks and economically inefficient. Agricultural PDBs finance this type of agriculture with campaign credits that allow farmers to buy the inputs required for the crop.

In agricultural value chains, storage infrastructure is a key investment to improve supply chains to regional markets and ensure the availability of seasonal food over longer periods. **Solar-based cooling systems are very effective and economically efficient.**

- Challenges for PDBs in the adaptation approach
  - Develop credit products to finance sustainable agricultural production systems such as agroecology, agroforestry and silvo-pastoral
  - Promote and finance technologies that optimize water resources: solar pumping, precision irrigation, rainwater harvesting and storage

[1] https://www.greenclimate.fund/project/fp179

- Agricultural PDBs are very effective in providing seasonal credit loans for intensive agricultural production. Insurance mechanisms should be associated with input credits to reduce the risk for banks.
- Develop lines of financing for productive infrastructure oriented towards the conservation, storage, processing of local agricultural production and local seed production.
- In livestock sectors, PDBs should promote and finance technologies that transform waste into organic fertilizer through anaerobic bio-digestion processes (biodigesters).
- In all sectors, the PDBs should progressively introduce criteria for biodiversity conservation, reforestation, respect of vegetation corridors in industrial crops (rubber, oil palm, cocoa, etc.) in order to contribute to the conservation of local fauna.

Constraints/ Maladaptation

Many of the external funding lines aimed at addressing CC are invested in mitigation projects..

The concept of adaptation is still poorly understood and misdirected in the banks' departments. It is simpler to talk about mitigating GHG emissions than about adaptation.

Partnerships with public and private actors are one of the keys to successful dissemination of adaptive technologies and their financing

The adaptation gap report 2022 (AGR) looks at the benefits of prioritizing actions that both reduce greenhouse gas emissions and help communities adapt, such as nature-based solutions, and calls for countries to step up funding and implementation of adaptation actions. Additionally, the report discusses adaptation effectiveness and looks at adaptation-mitigation linkages and co-benefits.

Resources and risks

For financial institutions, **adaptation must be linked to the notion of financial risks**. Indeed, climate change will impact the bank's assets and therefore the value of its portfolio. Climate-related financial risks have two main dimensions:

- **Physical climate risks**. Under the NGFS framework (Network of Central Banks and Supervisors for Greening the Financial System - NGFS 2020b), they are subdivided into two categories: chronic risks and acute risks. Chronic risks result from gradual shifts in biophysical and climate characteristics over time due to climate change. This includes, for example, changes in labor productivity due to gradually warming temperatures or reductions in agricultural output due to shifting rainfall patterns. Acute risks refer to changing frequencies or severity of shocks, such as natural catastrophes, including flooding, tropical cyclones, wildfire, heat waves or droughts (IPCC 2012).
- **Climate transition risks**, that are financial risks associated with the way policies, regulations, changing sentiments, or technological shocks are introduced in the low-carbon transition (Carney 2015).

Adaptation is often poorly funded by financial institutions, mainly because it is not well known. Improving knowledge on adaptation relates to tracking the finance for activities that address current and expected effects of climate change.

Adaptation finance tracking process consists of the following key steps:

- Setting out the context of risks, vulnerabilities and impacts related to climate variability and climate change;

- Stating the intent to address the identified risks, vulnerabilities and impacts in project documentation; o Demonstrating a direct link between the identified risks, vulnerabilities and impacts, and the financed activities.

Adaptation finance tracking requires adaptation activities to be disaggregated from non-adaptation activities and requires the creation and implementation of indicators to consider the need to adapt to climate change.

First, these indicators are specific to a given climatic and social context and their cross-sectoral aggregation is complicated to apply at portfolio level (it will be necessary to go through a derived aggregable indicator, for example with a conversion into a shadow price). There are many relevant indicators.

We can therefore see that for the PDBs, **the challenges are not only the apprehension of future problems but also to seize opportunities**, in a business perspective.

III. PDBs' responsibility for climate change adaptation

Act on the application for funding

By integrating climate risks assessment in agriculture lending operations financial institution will facilitate the deployment of the most cost-effective technologies to resiliently increase yield in the face of climate change. Investments for better soil and water management can improve the resilience of rural incomes by retaining water and soil nutrients, growing crops, providing forest products, assuring water availability and quality, and providing other essential ecosystem services.

Actions to be undertaken by PDBs to increase funding for CC adaptive measures

- **Provide assistance to their clients in formulating funding applications** that incorporate adaptation to the CC.
- **include the concept of climate resilience in the evaluation scheme of projects** submitted for funding.
- **Collaborate with national, regional and multilateral institutions** to improve knowledge on CC adaptation measures in the agricultural, livestock, water resources, soil and biodiversity management sectors.
- **Incentives to develop more climate change adaptation bank-oriented demands** from other actors.

Non-exhaustive list of adaptation measures

- Proven ecosystem-based adaptation (EbA) solutions such as soil covering based on organic cover, micro-catchment water harvesting (Zai, half-moon). These EbA solutions will be selected through defined quality standard criteria.
- Production and/or commercialization of bio and organic pesticides
- Commercial valorization of microorganisms in substitute for or in diminution of mineral N fertilizer and pesticides for crop production
- Post-harvest solutions
- Water storage facilities
- Storage facilities for crop and food conservation and protection
- Transformation of agricultural products using energy efficient and renewable solutions (value addition in the value chain)

- Low cost locally manufactured protected cultivation solutions (net shade or poly houses or structures) adapted to specific crops and local climate
- Advanced modern undercover growing solutions adapted to specific crops and local climate
- Low-cost hydroponics solutions
- Digital farming systems
- Precision irrigation
- Precision fertigation
- Crop management technologies
- Selected economic diversification activities such as aquaculture, aquaponics systems,
- Promotion of bio certified agriculture, permaculture, agroecology, agroforestry
- Agronomic optimization technics such as season duration and planting time management services
- Climate-informed irrigation calendar
- Early warning systems on climate risk assessments

Final comment

This note has been prepared by the "**Agricultural Public Development Banks Platform for Green and Inclusive Food Systems**" team:

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