

C4 Financing Climate-Smart Agriculture



C4 - Overview

C4 - 1 Economics of climate-smart investments

C4 - 2 Financing opportunities for climate-smart agriculture

C4 - 3 Mainstreaming climate-smart agriculture into national agricultural investments

C4 - 4 Conclusions

C4 - Annex

C4 - Acknowledgements

C4 - Acronyms

C4 - References

Overview

This module considers several aspects of investing in climate-smart agriculture. The first section, which provides the economic rationale for investing in climate smart solutions, notes that, while the cost of climate change adaptation and mitigation is high, the cost-benefit balances of investments in climate smart agriculture are overwhelmingly positive. The second section focuses on the financing needs for making the transition to climate-smart agriculture and provides an overview of the available financing sources. Specific focus is placed on the need to mainstream climate-smart agriculture considerations into national budgets, and the importance of leveraging additional resources, particularly, domestic and foreign private capital to scale up climate-smart agriculture. The third section delves deeper into mainstreaming climate-smart agriculture into broader agricultural investment strategies, covering topics such as climate-smart agriculture in national climate action planning and programming, and approaches and tools for incorporating climate-smart agriculture into agriculture investment decisions.

Key messages

- Climate-smart interventions in agriculture require substantial investments and innovative types of financing to support the transformational changes that are needed to maintain or increase agricultural productivity while using less resources, and build the resilience of vulnerable farming communities to the impacts of climate change while also reducing or removing greenhouse gas emissions.
- Although the cost of climate change adaptation is high, evidence indicates that the cost-benefit balances of investments in climate-smart agriculture are overwhelmingly positive, with the major benefits achieved through sustainable increases in yields, improved livelihoods and greater food security among the rural poor.
- The current levels of financing for climate change adaptation and mitigation in the agricultural sectors are

not sufficient.

- Global climate finance in agriculture can play a crucial catalytic role by encouraging the mainstreaming of climate change considerations into national sustainable development and sector plans and programmes; removing the barriers for adoption of new technologies and private sector investment; and developing an enabling environment conducive for scaling up for climate-smart agriculture.

Economics of climate-smart investments

There has been a growing movement at international and national levels to adopt and scale up climate-smart agriculture. Pursuing climate-resilient development pathways requires innovative, substantial and long-term agricultural investments that can allow policy makers, producers and other stakeholders in the food and agriculture value chains to assess, promote and adopt climate-smart agricultural approaches and practices. The implementation of climate-smart agriculture approaches that can harness the synergies that exist among activities that deliver adaptation, productivity and food security benefits and that can also lead to reduced greenhouse emissions or increased carbon sequestration, entails additional costs, particularly for up-front financing.

Many climate-smart agricultural practices are relatively low-cost. They can also deliver multiple benefits in terms of increased production and enhanced climate change adaptation and mitigation, which increases their cost-effectiveness. Estimates on the costs and benefits of adaptation to climate change vary. These variations result from differences in regional coverage, climate change scenarios, methods and models, as well as in the adaptation measures and sectors that are considered and over what timeframe. Despite these differences, results from various global studies suggest that the costs of inaction far outweigh the costs of adaptation to climate change (OECD, 2012; Stern 2014; OECD, 2015). For example, the world's largest programme for building the resilience of smallholder agricultural producers to climate change, the International Fund for Agricultural Development (IFAD) Adaptation for Smallholder Agriculture Programme (ASAP), will deliver positive returns to investment across a range of climatic scenarios if adoption rates are high. Ex-ante economic analysis shows that, over a 20-year timeframe, the 32 country-level ASAP investments approved since 2010 will generate and redistribute net worth USD 0.44 to 1.63 per dollar invested to smallholder farmers and other project beneficiaries, and generate a mean net present value of USD 6.8 million (IFAD, 2016). These conclusions are consistent with results of other studies that compare the costs of inaction with the costs of adaptation using country-level analyses (Box C4.1).

Box C4.1 Investing in adaptation: the case of Viet Nam's agriculture

A case study for Viet Nam shows that the economic costs of climate change are likely to be far higher than the costs of adaptation (World Bank, 2010). Although adaptation interventions will not prevent the economy from suffering losses as a result of climate change, they will significantly reduce their magnitude. Without adaptation, annual agricultural losses due to climate change are projected to be about USD 2 billion. Some losses are likely to be incurred even with adaptation, but they would be limited to about USD 500 million – a reduction of approximately USD 1.5 billion per year. Adaptation would include the farmer's own adaptation strategies (e.g. changing planting dates and using drought-tolerant or salinity-resistant varieties) and government interventions (e.g. investments in irrigation and increased spending on agricultural research and development). The costs of adaptation, estimated at about USD 160 million annually between 2010–2050, would be a fraction of the savings gained from implementing adaptation actions.

Although there are few systematic studies on the cost of climate change adaptation in agriculture, the evidence

suggests overwhelmingly positive cost-benefit balances and justifies making the considerable investments required. The economic case for investing in climate change adaptation in the agriculture sectors becomes even stronger when the investments costs in climate-smart agricultural practices are weighed against the gains in terms of yield increases, improvements in income and livelihoods, the reduction in the number of food insecure, and mitigation co-benefits. Other important co-benefits include the conservation of biodiversity, improved soils and more sustainable water management. Positive economic returns can be demonstrated for multiple practices that build adaptive capacity and reduce the emission intensity of goods derived from crop and livestock production, forestry, and fisheries and aquaculture (Box C4.2).

Box C4.2 Costs and benefits of climate smart agriculture practices

Tropical Agricultural Research and Higher Education Center (CATIE) through its Mesoamerican Agroenvironmental Program (MAP) and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) conducted a cost-benefit analysis (CBA) of 15 agricultural practices in the Trifinio region (a cross-border area between Guatemala, Honduras and El Salvador) and in Matagalpa, Nicaragua. The practices had been initially prioritized based on a qualitative evaluation of their contribution to the three objectives of climate-smart agriculture: improve food security, increase the ability of vulnerable groups to adapt to the impacts of climate change and, where possible, the reduce or remove greenhouse gas emissions. The selected options included climate-smart agroforestry practices (integrated coffee and cocoa production), home gardens, basic grains production and pastures. The economic analysis followed a standard application of CBA that had been adapted for climate-smart agriculture evaluations (Sain *et al.*,2017).

The CBA results showed that even though the implementation of most of the climate-smart agriculture practices impose additional costs to producers, these costs are offset by a number of benefits associated with these practices. The main benefits include the additional income generated by new products, greater resilience to negative economic impacts (e.g. falling prices) and greater availability of food for the family. Many of the practices also generate environmental co-benefits, such as the protection of biodiversity, the reduction of soil erosion and increased capture of carbon dioxide. The CBA results indicated that all the climate-smart agriculture practices had a cost-benefit ratio greater than 1 (i.e. the benefits outweighed the costs). In Nicaragua, for example, farmers can increase their cost-benefit ratio from 1.67 to 1.85 by adopting new seeds varieties. The cultivation of vine crops in home gardens was found to be the most profitable practice in both Nicaragua and Trifinio, with internal rates of return calculated at 178 percent and 141 percent respectively.

Source: Sellare, 2016.

Adaptation and mitigation in agriculture also involve investments in other critical areas such as, developing an enabling policy framework; strengthening institutional capacities, including the establishment of reliable information and early warning systems; and improving financial, market and extension services. These actions may not make up the major part of the required investment costs for the implementation of NDCs. They can however provide important incentives for changing the behaviour of agricultural producers and other private sector stakeholders in the food value chain, which is critical for making the transformational change towards climate-smart agriculture.

Financing opportunities for climate-smart agriculture

Agriculture and climate change are inextricably linked. All the agriculture sectors are extremely vulnerable to climate change. The agriculture sectors are also a major source of greenhouse gas emissions, contributing an estimated at 19 to 29 percent of global emissions. By necessity, the transition to climate-smart agriculture is a critical and integral part of global effort to reach SDG 13: 'Take urgent action to combat climate change and its impacts'. The Paris Agreement, the central outcome from the 21st Conference of the Parties (COP21) of the UNFCCC laid a foundation for global action on adaptation and mitigation in agriculture. NDCs are at the heart of this agreement. However, the amount of financing required for implementation of the NDCs for priority adaptation and mitigation interventions in the agricultural sectors far exceeds the funds pledged so far for this purpose.

Global climate financing is complex and continuously evolving. Funds flow through multilateral, bilateral and national channels, dedicated climate change funds, and the private sector. Multilateral channels include the UNFCCC financing mechanisms, multilateral development banks (MDBs), bilateral donors and other international institutions and funds. National budgets and an increasing number of regional and national dedicated climate funds are also crucial sources of climate finance.

Available estimates suggest that the private sector is by far the largest source of financing for climate change adaptation and mitigation efforts, contributing approximately 62 percent of the USD 391 billion invested in addressing climate change in 2014 (Buchner *et al.*, 2015). Farmers are the biggest investors in agriculture. Most agricultural investments are financed from domestic public and private resources, with only a small share flowing from international sources. The overall domestic government spending on agriculture amounted to USD 252 billion in 2012 (FAO, 2016). While small in comparison, international public finance can serve as an important catalyst for leveraging greater domestic public and private sector investments in agriculture, including investments in climate-smart agriculture. There are a growing number of multilateral sources of climate finance, such as MDBs, [Green Climate Fund \(GCF\)](#), the [Global Environmental Facility \(GEF\)](#), and bilateral donors, which are promoting public-private partnerships to catalyse private sector investment.

The climate finance landscape features many different funding channels with different objectives and eligibility criteria. These options increase the possibilities for developing countries to access climate finance, but they also make the process more complicated. Financing options specifically targeting climate-smart agriculture remain limited but they are increasing. The emergence of these options necessitates strategic uses and combinations of traditional development assistance and dedicated climate finance mechanisms. Activities funded by public finance can have a strong catalytic effect, encouraging the mainstreaming of climate change considerations into national sustainable development plans and programmes, and sectoral development strategies. They can also help remove barriers that hinder agricultural producers, particularly smallholder producers, from adopting new technologies, which will stimulate private sector investment. Public funding can support the development of an enabling environment that is conducive for scaling up climate-smart agriculture, which will also help attract increased public and private financing for the agriculture sectors.

C4 - 2.1 Utilizing international funding sources

International climate finance can act as a catalyst for the broader adoption of climate-smart agriculture practices by demonstrating the feasibility these approaches in terms of their social, environmental and financial returns; facilitating the mainstreaming climate-smart agriculture priorities into national policy and legal frameworks; leveraging private capital; and promoting the creation and transfer of skills, knowledge and technologies. If used correctly, the leveraging of relatively small amounts of international climate finance can help to transform public agriculture budgets and private investments into sources of climate-smart agriculture financing. For many countries, learning how to access and effectively use international financing options represents the first step in the

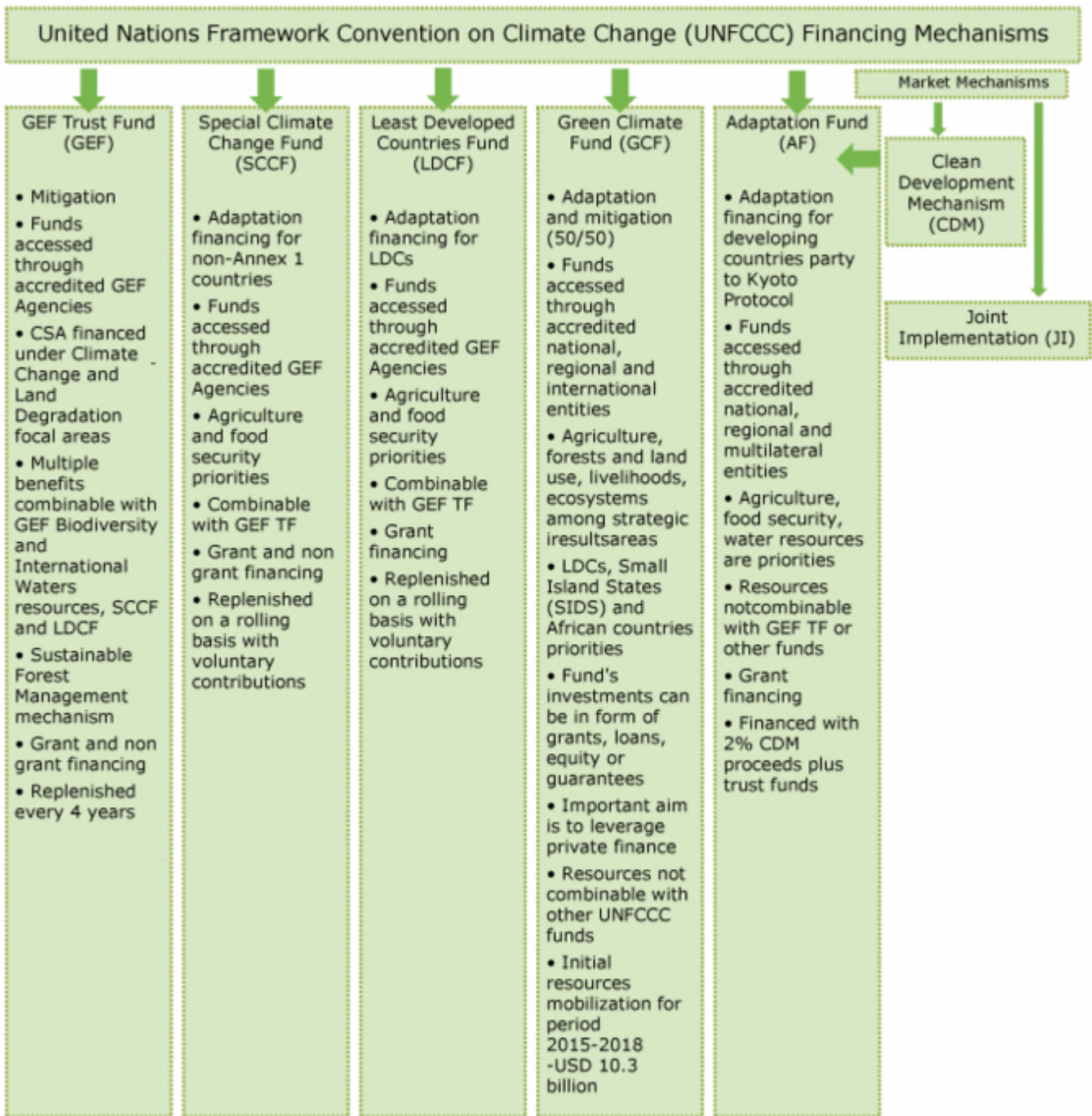
long-term transition towards climate-smart agriculture.

Globally, the level of international support for climate change mitigation has far surpassed the financial support directed to adaptation. In recent years, however, there has been a shift towards increasing financing for adaptation, particularly by bilateral donors. Forest conservation interventions and programmes in developing countries to reduce emissions from deforestation and forest degradation, and strengthen the role of conservation and sustainable management of forests to enhance of forest carbon stocks ([REDD+](#)) have been financed mainly as a mitigation opportunity. However, bilateral donors are now moving towards forest interventions that support both mitigation and adaptation objectives. Funds available for fisheries are predominantly for adaptation.

UNFCCC financing mechanisms

The architecture of the UNFCCC financing mechanisms is illustrated in Figure C4.1.

Figure C4.1. UNFCCC Climate Financing Mechanisms



Source: Authors

Direct access is an innovative implementation modality of the UNFCCC funds. In line with the Paris Declaration on Aid Effectiveness (2005) and the Accra Agenda of Action (2008), which promote country ownership and leadership on aid coordination and delivery, direct access has become the preferred implementation modality of recipient countries, the United Nations and other financing and development partners. The [Adaptation Fund](#) was the first UNFCCC fund to pioneer and fully operationalize direct access to climate financing. The GCF is strongly promoting direct access, and the GEF has also accredited a few national and regional entities as GEF agencies. The GCF has established a Readiness Programme to strengthen countries' engagement with the Fund, support activities to enhance country ownership and access, and prepare countries to receive and manage climate financing.

The GEF has been one of the largest sources of finance for climate change mitigation. The fund reported to COP21 that, since its creation in 1991, it has financed 839 projects for climate change mitigation, directing more than USD 5.2 billion in financing to more than 167 countries. GEF has also mobilized USD 32.5 billion in co-financing. Under the Sixth Replenishment of the GEF (GEF-6), which continues to June 2018, activities that support mitigation-focused management practices in land use, land-use change, forests and agriculture, with specific reference to climate-smart agriculture, are priorities in the GEF's climate change focal area. Climate-smart agriculture is also a priority under GEF's land degradation focal area, as well as in the GEF's integrated approach pilot programme, ['Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa'](#). Through its Sustainable Forest Management Strategy, GEF has sought to develop long-term, integrated, sustainable approaches for managing forest ecosystems. Support to sustainable forest management figures prominently in the GEF's biodiversity, climate change, and land degradation focal areas, as well as in its integrated approach programme, ['Taking Deforestation out of Commodity Supply Chains'](#). In the ongoing negotiations on the GEF-7 programming directions (GEF, 2017), the climate change focal area is being aligned with priorities identified in NDCs to the Paris Agreement.

While the programming directions for the seventh replenishment of the GEF (GEF-7) are still emerging, it is clear that GEF-7 will continue to promote synergies and deliver multiple benefits across GEF focal areas and through GEF's new Impact Programmes, which will provide support particularly to agriculture, food security and forestry. One of the proposed GEF-7 Impact Programmes focuses on sustainable food systems, land use and landscape restoration in an integrated programmatic way. A second Impact Programme focuses on sustainable forest management. Properly conceptualized and formulated, climate-smart agriculture priorities can be supported under both the emerging GEF-7 focal area strategies, the integrated approaches and Impact Programmes.

Under the guidance of the UNFCCC Conference of Parties, the GEF also administers the [Least Developed Countries Fund \(LDCF\)](#) and the [Special Climate Change Fund \(SCCF\)](#), which were established to support countries in the preparation and implementation of National Adaptation Programmes of Action (NAPAs). NAPAs are country-driven strategies that identify urgent and the most immediate needs of least developed countries to adapt to climate change by increasing resilience and reducing vulnerability. The GEF Council has requested the GEF Secretariat to develop a new strategy for the LDCF, which could further enhance support to smallholder agricultural producers who are facing heightened vulnerabilities from the impacts of climate change. The SCCF is open to all vulnerable developing countries and supports a wider range of activities related to climate change than the LDCF. While adaptation is a top priority for the SCCF, a separate financing window also supports the transfer of climate-resilient technology for both adaptation and mitigation, including in the areas of agriculture, forestry and water management. Regional climate technology centres and networks have been funded through this window.

Activities related to climate-smart agriculture are prominent in the portfolio of LDCF and SCCF projects approved to date. GEF, LDCF and SCCF resources can be accessed through the 18 GEF agencies, which are represented by a range of international, regional and national entities.

The Adaptation Fund was established under the Kyoto Protocol of the UNFCCC for the purpose of financing adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol, which help communities that are particularly vulnerable to the adverse effects of climate change. Primary funding comes from a 2 percent share of proceeds of the Certified Emission Reductions (CERs) issued by Kyoto Protocol's Clean Development Mechanism (CDM). More recently, contributions from bilateral and private donors have become an increasingly important source of funding. Contributions to the Adaptation Fund total USD 618.84 million, of which USD 480.34 million has been committed. The World Bank serves as the interim trustee of the Adaptation Fund, and 2017 figures can be found at the [World Bank's Adaption Fund](#) web page. Many Adaptation Fund projects are focused on building adaptive capacity to climate change through agriculture, food security and nutrition activities and/or directly promoting climate-smart agriculture.

Established in 2010, the GCF is the newest and largest multilateral climate fund. An important share of new multilateral funding is expected to be channeled through the GCF. As of September 2017, USD 10.3 billion has

been mobilized for the period 2015 to 2018, of which USD 10.1 billion has been committed. Forty-three projects have been approved for USD 2.2 billion in GCF resources for a total value of USD 7.5 billion (with co-financing). Projects in the agricultural sectors represent an important share of approved projects.

The GCF seeks to trigger a paradigm shift by supporting developing countries towards low-emission, climate-resilient development pathways. Investments in the agricultural sectors are well aligned with the GCF's stated priorities. Out of its eight strategic results areas, four are directly linked to the agriculture sectors. One of these areas is reducing emissions from deforestation, forest degradation and land use, which addresses mitigation. The other three areas, which focus on adaptation are: increasing resilience of health, food and water security; livelihoods of people and communities; and ecosystems and ecosystems services. GCF-funded activities should be country-driven, linked to NDCs, National Adaptation Plans (NAPs), and Nationally Appropriate Mitigation Actions (NAMAs), and integrated into national development plans and strategies. The GCF promotes an equitable allocation of resources (50/50 split) between mitigation and adaptation, with 50 percent of the adaptation portfolio to be allocated to small island developing states, least developed countries, and Africa. The GCF recognizes the tremendous potential of private sector investment, notably in the areas of agriculture and forestry. An important GCF innovation, the [Private Sector Facility](#), uses public investment to stimulate private finance for climate-friendly, low-emission, climate-resilient development.

GCF resources can be accessed directly through regional, national and subnational accredited entities or through international accredited entities. As of 30 September 2017, out of the 54 accredited entities, there are 24 direct access entities, 8 private sector entities and 22 international entities. Country ownership and direct access are guiding principles of the GCF. Through its Readiness Programme, the GCF seeks to enhance country ownership. The Readiness Programme also strengthens the institutional capacities of the National Designated Authorities and direct access entities so that they can engage directly with the Fund, build a pipeline of activities and manage resources. The Readiness Programme also supports the accreditation of regional, national and subnational entities.

MDBs are an important and growing source of climate finance. The Joint Report on Multilateral Development Banks' Climate Finance provides data from the world's six largest multilateral development banks: the African Development Bank Group ([AfDB](#)), the Asian Development Bank ([ADB](#)), the European Bank for Reconstruction and Development ([EBRD](#)), the European Investment Bank ([EIB](#)), the Inter-American Development Bank (IDB) and the [World Bank Group](#). According to the 2016 report, MDBs invested a total of USD 27.4 billion into climate financing in developing and emerging countries, up from USD 25 billion in 2015. Collectively, since 2016 the banks have committed over USD 158 billion in climate finance in developing countries and emerging economies (AfDB *et al.*, 2016).

Agriculture and related agricultural and ecological services are receiving a growing share of these financial resources. Financing directed to crop production and food security, for example, increased from 18 percent in 2015 to 23 percent in 2016. As MDBs are increasingly incorporating environmental sustainability criteria into their agricultural lending practices and providing more support for climate action, opportunities are growing for countries to obtain financing from the MDBs for climate-smart agriculture activities. An indication of the magnitude of potential MDB climate financing, is the fact that the EIB has made climate action one of its top priorities and will provide approximately USD 100 billion for climate-related projects over the next five years.

In many cases, financing from dedicated climate funds, such as GEF and other sources, often in the form of grants and technical assistance, are blended with MDB lending to specifically address climate change. Independent of MDB financing, the net total of climate co-financing committed during 2016 resources was USD 37.9 billion. When this is combined with the MDB climate finance, 2016 total climate finance amounted to USD 65.3 billion (AfDB *et al.*, 2016). At the core of grant-based climate finance provided through the MDBs are the Climate Investment Funds (CIFs), a joint initiative of the World Bank Group and the regional development banks. CIFs provides climate finance in line with the UNFCCC framework and consists of four major programmes, including the [Pilot Program for Climate Resilience \(PPCR\)](#), which provides concessional financing to integrate climate risk and resilience into core development planning and lending operations. The PPCRC represents an important financing

option for climate-smart agriculture and its funding is earmarked for climate adaptation activities. Eligible countries have a unique chance to receive significant funding for implementing a climate-smart agriculture approach on a large scale through the PPCR process.

In addition to the jointly implemented CIFs, several of the MDBs also administer their own specific climate change financing mechanisms. IFAD manages the ASAP, which has become the largest global financing source dedicated to supporting the adaptation of poor smallholder farmers to climate change. The IDB, in partnership with GEF and a number of bilateral donors, has launched the Climate-Smart Agriculture Fund for Latin America and the Caribbean ([CSAF](#)), which works to leverage private sector investment in sustainable agriculture, forestry and rangeland systems (see Box C4.3). Other examples include The World Bank's and the AfDB's Forest Carbon Partnership Facility (FCPF) and the Congo Basin Forest Fund ([CBFF](#)), respectively, which support sustainable forest management and complement the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries ([UN-REDD](#)).

Box C4.3 Climate Smart Agriculture Fund for Latin America and the Caribbean (CSAF)

In 2015 the IDB announced the establishment of the CSAF to provide incentives to private sector companies in the region to scale up investments in climate-smart agricultural practices in order to increase carbon sequestration, build resilience to climate change and improve farmers' livelihoods. Created in partnership with the GEF, CSAF seeks to unlock greater private-sector investment in sustainable land use and climate-resilient agribusiness.

Climate-smart agriculture investors face a number of hurdles in accessing finance, including lengthy payback periods. They also can encounter significant barriers in obtaining information on sustainable climate-smart practices. As a result, climate-smart investments may be put off indefinitely, which perpetuates poor land-use management, contributes to greenhouse gas emissions, increases the vulnerability of agricultural producers to climate change and lowers incomes for small producers.

CSAF addresses these barriers by offering risk-tolerant capital to catalyse private investment by insuring early losses and providing a concessional tranche of resources that can transform projects into sustainable business investments. Associated technical assistance will enable IDB to build the necessary capacity for project implementation and disseminate lessons learned to other private sector investors.

Bilateral Climate Finance

Data indicates that bilateral development assistance has been the dominant source of international public finance for climate change adaptation and mitigation in crop and livestock production, forestry and fisheries and aquaculture. Bilateral development assistance has provided financing for the UNFCCC financing mechanisms, as well as to the funds set up with a specific climate focus under the United Nations and the MDBs (e.g. UN-REDD and the MDB climate funds mentioned in the previous section). This bilateral assistance has also supported bilateral and multilateral initiatives dedicated to climate action.

In terms of agricultural priorities, bilateral donors and dedicated multilateral climate funds have a significant focus on capacity development, including policy development and institutional strengthening in all the agriculture sectors. That focus is most pronounced for the forestry sector, where 57 percent of bilateral finance and 75 percent of dedicated multilateral finance supports policy development, particularly for REDD+ readiness, which assists governments in developing national REDD+ plans and strategies. Similarly, in the fisheries sector, 43 percent of

bilateral climate funding, and more than 90 percent of multilateral climate funding, were allocated to supporting policy development and strengthening institutions. Recently, support has grown for cross-cutting programmes in the forest and agricultural sectors.

Most bilateral and dedicated multilateral climate funding for agriculture supports both agricultural development and agricultural policy, although funding is spread across a wide range of subsectors. Approximately 40 percent of bilateral agricultural climate finance is tagged broadly for agricultural development, with donors focusing overwhelmingly on rural development. Bilateral donors have specifically sought to support smallholders in moving from subsistence farming to producing a marketable surplus by improving irrigation, strengthening agricultural value chains and promoting inclusive models for contract farming. There are only a few dedicated climate projects that support low-carbon and climate-resilient crop and livestock production. They account for 4 percent of total reported bilateral finance for crop production and 0.1 percent for livestock production (FAO, 2016).

C4 - 2.2 Integrating climate in national budgets

Domestic government budgets constitute a much more significant source of public investment in agriculture than international public climate finance institutions. Importantly, using domestic budgets to effectively implement climate agendas allows governments to leverage international climate financing and pave the way for a broad, effective financing strategy for climate actions at the national level.

Accessing and utilizing global climate financing from sources such as GCF and other multilateral and bilateral funds, provides the opportunity for governments to scale up national climate change adaptation and mitigation activities. However, for countries to receive these funds, robust finance and governance structures need to be in place to support the effective, efficient and accountable implementation of activities that are funded by these global climate financing mechanisms. Examples of the new national level climate finance institutions include national climate funds (NCFs). NCFs have emerged as an important part of the institutional architecture for the management of climate change expenditures. The institutional mandates and governance arrangements of NCFs may differ from one country to the next. Some NCFs cover both adaptation and mitigation actions. Some build on existing environment funds, while others have been created as new institutions dedicated to climate change (see Box C4.4). NCFs can play an important complementary role in the management of climate change expenditures within a broader institutional framework centred on the government's core budget and planning systems.

To date, experience and evidence from studies at the national level highlight the need for capacity development to allow governments to move towards the systematic integration of climate change actions into their budgets (UNDP, 2015). Dedicated climate finance should support the strengthening of national systems and the development of capacities for mainstreaming climate change actions into policy frameworks. This includes:

- reviewing planning and budgeting processes and related institutional roles, to identify and address bottlenecks in policies, incentives and institutions, which impede an integrated approach to climate change;
- strengthening the capacity of institutions and stakeholders at national and subnational levels, particularly the technical and functional expertise needed to translate policies into programmes and budgets, and track and assess performance; and
- enhancing transparency frameworks to demonstrate results and ensure accountability.

Efforts to enhance the integration of climate change into government budgets should always be aligned within ongoing efforts to strengthen the management of public finances and expenditures (World Bank, 2014). Just as climate change should not be considered as a stand-alone issue, climate change budget mainstreaming needs to be addressed in the context of a country's overall financial management systems. More work is needed to improve methodologies for reviewing climate-relevant public expenditures and assessing their effectiveness, and develop practical guidelines and tools that countries can adapt to their specific circumstances, including tools that can support the integration of climate change in cost-effectiveness analyses and investment appraisals.

Box C4.4 Mobilizing and managing climate finance at national level: Examples of National Climate Funds

The Government of Rwanda is one of a few countries that have developed a national climate change and environment fund: Rwanda's Green Fund, known as [FONERWA](#). Built on the newly adopted national [Green Growth and Climate Resilience Strategy](#), FONERWA is designed to ensure sustainable financing is accessible to support environmental sustainability, resilience to climate change and green growth. FONERWA is intended to be the primary mechanism through which Rwanda accesses, programmes, disburses and monitors international and national extra-budgetary climate and environment finance. Funds will be distributed to government agencies, private sector groups, civil society organizations and communities to implement a range of projects. The management team of the fund, which began operation in early 2013, works in close collaboration with the Rwanda Environment Management Authority, the Rwanda Development Bank and the Ministry of Finance.

The Indonesia Climate Change Trust Fund ([ICCTF](#)) is an example of an NCF designed to develop innovative ways to link international finance sources with national investment strategies. Created by the Government of Indonesia, it acts as a catalyst to attract investment and implement a range of alternative financing mechanisms for climate change mitigation and adaptation programmes. The ICCTF receives non-refundable contributions from bilateral and multilateral donors. The main funding mechanism of the ICCTF is the 'Innovation Fund', which provides grants to line ministries to support climate change related projects within the government. ICCTF became a national trust fund in 2015 and has been allocating funds for climate change programmes in accordance with 2015-2019 National Mid-term Programme Plan. ICCTF has received funding and commitment supports from various development partners, including the United States Agency for International Development (USAID), United Kingdom Climate Change Unit (UKCCU), and the Royal Danish Embassy, as well as funding support from State Revenues and Expenditure Budget (APBN) as a commitment of the Government of Indonesia to combat climate change. ICCTF has also been increasing its engagement with other parties, including the private sector.

Mainstreaming climate-smart agriculture into national agricultural investments

The mobilization of additional financing for addressing issues related to climate change in agriculture will not be effective without systematically integrating climate-smart agriculture priorities into broader agricultural strategies and plans, and mainstreaming climate-smart agriculture into the design, appraisal, implementation, and monitoring and evaluation of investment projects.

C4 - 3.1 Climate-smart agriculture in the national climate action planning

The implementation of the climate-smart agriculture requires the translation of its core principles into actions at the national level. This directly concerns the mainstreaming of climate change considerations into a range of policies and action areas that are central to agriculture and food security. The challenge is also to incorporate the agriculture related concerns in agriculture into national climate change strategies and plans.

A series of instruments designed under the UNFCCC for linking international climate change commitments to concrete action for mitigation and adaptation at the country level could be used for mainstreaming climate-smart

agriculture into national planning and programming.

- A NAPA is a dedicated, harmonized, country-led instrument for least developed countries. NAPAs identify priority activities for climate change adaptation that respond to “urgent and immediate needs” for which further delay could increase vulnerability or lead to increased costs at a later stage. To date, over 50 countries have prepared NAPAs. Agriculture and natural resource management issues are particularly prominent. The great majority of priority projects are related to the agriculture sectors and food security (FAO, 2012a). Most of these projects belong to one of five main categories: cross-sectoral activities (including early warning systems, disaster management, education and capacity building), management of ecosystems, water management, plant production and livestock, and diversification and income. All NAPAs are eligible for funding under the LDCF.
- NAPs focus on addressing medium- and long-term adaptation priorities and provide a significant opportunity to integrate the concerns and needs of the agriculture sectors and agricultural stakeholders into broad national strategies and policies. Three countries (Brazil, Burkina Faso and Cameroon) have each completed a NAP, and all give importance to adaptation in agriculture. Guidelines on addressing crop, livestock, forestry and fisheries adaptation needs in NAPs can be found in the 2017 FAO publication, [Addressing agriculture, forestry and fisheries in National Adaptation Plans – Supplementary guidelines \(FAO, 2017\)](#).
- NAMAs are defined by the UNFCCC as nationally appropriate actions prepared by governments in developing countries that reduce emissions within a wider context of sustainable development (UNFCCC, 2016). They typically include more detailed actions than NDCs and can be project-based, programmatic, sector-wide, or focused at the policy level. Sectoral policies need to be defined or revised and aligned with climate policies and priorities. Baseline scenarios have to be constructed and the mitigation potential of different options estimated. The barriers to implementation of these options also need to be identified. Institutional arrangements for coordination and financing, as well as for measuring, reporting and verification, must be established. About 13 percent of the NAMAs in the [UNFCCC NAMA registry](#) are in the agricultural sectors (UNFCCC, 2015).

C4 - 3.2 Incorporating climate-smart agriculture in agricultural investment decisions

The national climate change action plans in agriculture identify priorities for investments in adaptation and mitigation in the sector, which are to be delivered through the national government's agricultural investment project portfolios. The climate-smart agriculture approach allows climate risks to be addressed by developing investment strategies and designing agricultural investment projects that tackle the trade-offs and synergies between sustainable productivity, resilience, and mitigation. The successful implementation of the sector plans requires incorporation of climate-smart agriculture considerations in all stages of an investment cycle (design, preparation and appraisal, and implementation and evaluation) to maximize the economic efficiency of the use of limited investment resources (Box C4.5). Inadequate attention to the impacts of climate change and neglecting the opportunities offered by follow climate-smart agriculture approaches can increase the long-term costs of agricultural investments and reduce the expected benefits and, subsequently, the expected returns on investment.

Box C4.5 Incorporating climate-smart considerations into agricultural investment projects - A case study from China

In China, the Integrated Modern Agriculture Development Project (IMAD) incorporated climate change considerations into the project identification, design and implementation cycle. The five-year project, which was supported by the World Bank with a total investment of USD 313 million, started in April 2014.

During project identification, wide ranging policy, institutional and technical consultations were undertaken. These consultations highlighted the fact that climate change was a major challenge to sustainable agriculture development in the area and that the project would need to respond to these challenges accordingly. As a result, one of the project's development objectives included developing sustainable and climate-resilient agriculture systems in selected areas.

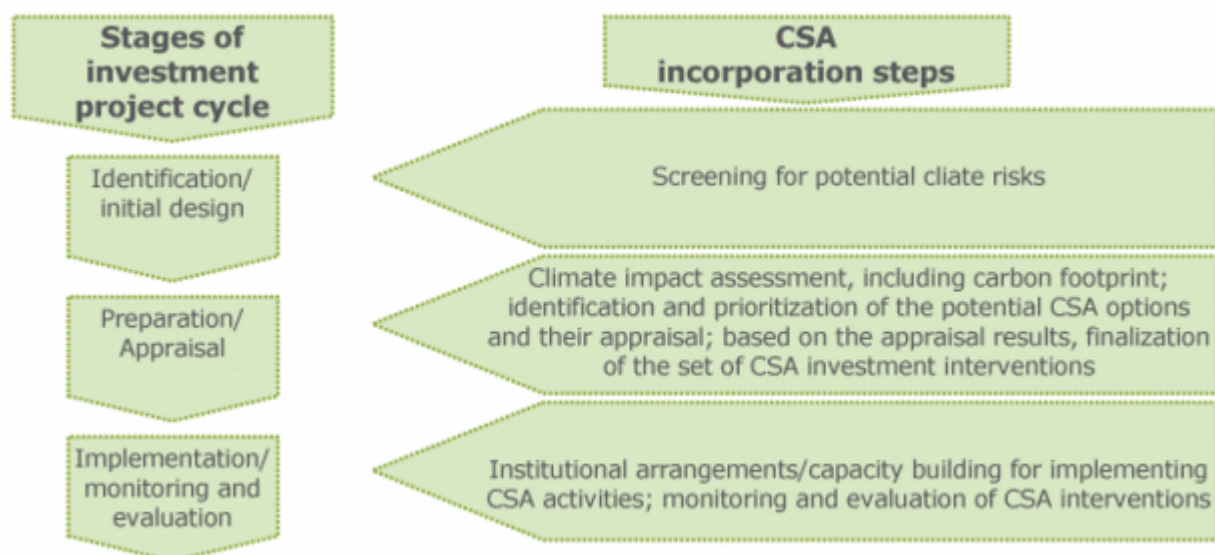
During project preparation, climate change vulnerability assessments were carried out. The impacts of climate change on water availability and demand were assessed and taken into consideration during water resource assessment and planning. The impacts of climate change were also reflected in the target values of project monitoring indicators. The outputs from these assessments, combined with knowledge gained from other climate change-related initiatives, led to identification of three project components: improvement of agricultural irrigation infrastructure to build resilience to more frequent and intense droughts and floods induced by climate change; the promotion of climate-smart agricultural practices, including improved land and crop management, adapted varieties and new technologies; and the strengthening of key institutions and staff capacity building.

During project implementation, the impacts of climate change on hydrological conditions at specific project sites were assessed, and adjustments were made in the design of water infrastructure. A training workshop on sustainable and climate-smart agriculture was organized two-years after the start of the project to refresh and update project staff's knowledge of the adjusted project concept and design.

During the mid-term review, the project results and monitoring framework was revisited, and indicators that were more specifically related to climate-smart agriculture were included to monitor the achievement project's development objectives.

Incorporation of issues related to climate-smart agriculture into agriculture investment decision-making processes can be achieved through a number of steps that can be taken throughout the investment project cycle (Figure C4.2). These steps include the preliminary screening of climate risks and vulnerabilities of agriculture at the sectoral level and project levels; assessing the identified climate impacts, and appraising and prioritizing climate-smart responses that are suitable to the specific context where the project activities will be implemented; and building institutional capacities to implement the climate-smart agriculture activities, and monitor and evaluate the results.

Figure C4.2. Incorporating climate-smart agriculture considerations into the investment project cycle



Source: authors

Screening for climate risks

Mainstreaming climate-smart agriculture into agricultural investments decision-making processes should start with the screening of climate change risks and the identification of potential climate-smart agriculture activities as an adaptation measure. The climate risks screening process can be done for:

- ongoing projects and portfolios to identify risks related to climate change and introduce measures to reduce vulnerability of the beneficiaries;
- proposed investments to identify the potential climate vulnerabilities of the planned project and introduce the necessary adaptation measures; and
- policies and strategies in order to take a comprehensive approach to climate adaptation through climate-smart agriculture and its integration into development planning and sectoral decision-making.

Some of the possible impacts of climate change on the agriculture sectors include:

- increases in average temperature can affect crop yields and introduce new invasive species;
- changes in seasonal rainfall can force shifts in planting seasons;
- sea level rise can inundate agricultural lands;
- more frequent and severe floods and droughts can harm crop and livestock systems; and
- implementation of some activities may lead to an increase in greenhouse gas emissions due to changes in land use patterns and livestock.

The impacts of climate change on the agriculture sectors are described in greater detail in the modules in section B of the Sourcebook.

The purpose of conducting an early-stage screening as part of due diligence is to identify and consider the climate and disaster risks during the concept stage of operations. For example, IFAD's Social, Environmental and Climate Assessment Procedures ([SECAP](#)) require that all IFAD-financed projects are screened for climate-related risks at early stages of their design. The required screening exercise should be used to determine the exposure of the project objectives to climate-related risks (high, moderate, low) based on available information about historic climate hazard occurrences, current climate trends and future climate change scenarios. The screening will also assess the likelihood that the project or programme will increase the vulnerability of the expected target populations to

climate hazards. The screening process should also examine the potential opportunities that arise from a better integration of climate issues.

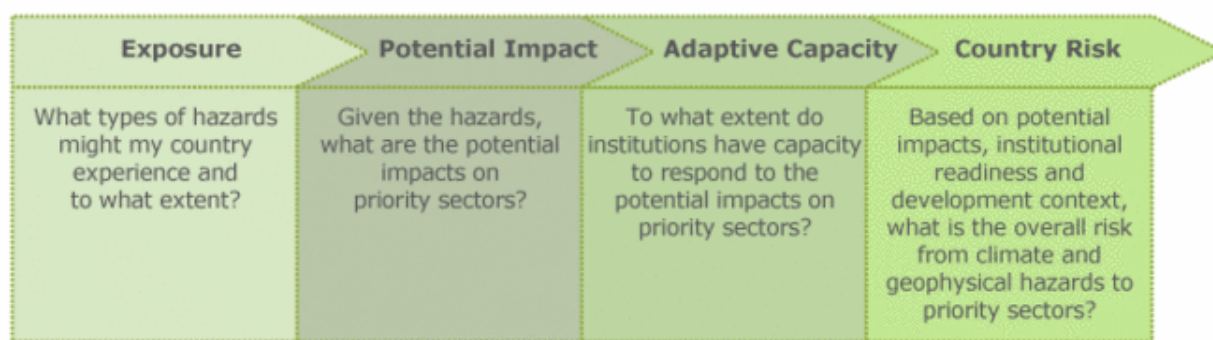
Over the past decades, a growing number of climate risk screening and assessment tools and methods have been tested in practical situations. The development and application of these tools have been driven mainly by international financing institutions and donor agencies. However, national stakeholders are also usually involved as part of the assessment teams in project climate risk screening and capacity-building activities. According to the World Bank (2013), the screening tools can be categorized in the two major groups. The first group includes computer-based tools to support decision-making that are primarily intended to help professionals identify climate-related risks and adaptation options for a specific project under preparation. They may also assist users in establishing priorities among different adaptation options as part of the decision-making process. These tools, which are designed to incorporate various types of data and inputs from various stakeholders, may include social vulnerability information and rely less on 'expert advice'.

The second group of climate risk screening tools refers to less formalized frameworks and procedures developed for screening projects and programmes or identifying policy priorities. These frameworks, which are typically developed by donor or public agencies and tailored to a specific decision-making process of the organization, tend to rely more on qualitative inputs and require expert advice. They may also incorporate climate science information. These screening processes can require more time to carry out compared with the computer-based tools. However, they may provide a more thorough analysis that is better tailored to the context-specific recommendations for climate risk reduction and adaptation. These climate risk frameworks for climate risks screening are illustrated by the World Bank methodology (Box C5.6). Specific checklists and procedures have been developed and can be applied to climate risk screening and identification of possible adaptation options for the agricultural investment projects.

Box C4.6 The World Bank climate and disaster risk screening tool for agriculture projects

The [Climate and Disaster Risk Screening Tool for Agriculture Projects](#) is designed to help World Bank staff and other development practitioners screen agricultural projects for risks from climate variability and change, as well as from geophysical disasters. It provides a systematic and transparent way of considering climate and disaster risks at the early concept stage of national policy and investment project development. The simple, self-placed tools provide step-by-step guidance to help users connect climate and disaster information to their planning or project components.

As illustrated in the diagram below, the screening process requires users apply their expertise and knowledge through a four-stage framework. When completed, these steps connect information on climate and geophysical hazard risks with the project team's understanding of both the project's sensitivity and the broader development context of the project location. The risks are highly dependent on the project's context and location. Rather than relying on automated processes, the tool enables users to apply their expertise and background to assess climate and disaster risks at the local level. The screening results will inform further consultations and dialogue, and help determine the appropriate level of effort for additional studies during project design and for policy and strategy work.



Other examples of climate change risk screening tools that have been developed by different organizations to rapidly assess the risks posed to a planned project due to natural hazards and climate change include:

- ORCHID - Opportunities and risks of climate change and disasters and climate risk impacts on sectors and programmes – United Kingdom The Department for International Development (DFID)
- [CRiSTAL - Community-based Risk Screening Tool – Adaptation and Livelihoods](#) – International Institute for Sustainable Development (IISD)
- [AWARE project climate screening tool](#) - ADB
- [CEDRA – Climate Change and Environmental Degradation Risk and Adaptation Assessment](#) – Tearfund

For detailed guides and comparisons between different screening tools consult UNDP (2010) and Trerup *et al.* (2011).

Assessing the impacts of climate change on agriculture

The climate risks assessments and screening can take advantage of the wealth of the available climate information available for different locations at the national, regional and local levels. The tools described in this section can be used to provide basic data or methodologies for analysing the impacts of climate change on the agriculture sectors in a given project area. The World Bank's [Climate-Smart Agriculture Country Profiles](#) have been developed to provide a comparable baseline of the state of climate-smart agriculture at both the national and subnational levels. The Profiles are intended to inform and stimulate discussion about how climate-smart agriculture approaches can be incorporated into project designs and effectively scaled up through investments. The Climate-Smart Agriculture Country Profiles bridge a knowledge gap by providing clarity on climate-smart agriculture terminology, components, relevant issues, and how to contextualize it under country-specific conditions.

A Climate-Smart Agriculture Profile covers the information needed to get a quick overview of the national context, the climate-smart agriculture interventions with the greatest potential, and opportunities and constraints for implementing climate-smart agriculture. The baseline includes an analysis of the agricultural, economic, institutional, policy, financial context, the climatic factors related to climate-smart agriculture, and opportunities and barriers to adoption of existing and promising practices and technologies. The target group is mostly decision-makers and donors, but also extends to practitioners and researchers.

The climate-smart agriculture profiles were initiated in 2014 by International Center for Tropical Agriculture (CIAT), CATIE and CCAFS, with support by the World Bank. The initial project focused on seven countries in Latin America and the Caribbean. CIAT has since conducted additional profiles with support from the World Bank and USAID. Profiles have been completed for 18 countries (e.g. Ethiopia, Kenya, Mexico, Nicaragua, Rwanda, Sri Lanka, Uganda, and Uruguay) and for two states in Mexico.

[The Climate Wizard](#), which was developed by CIAT, CCAFS and the World Bank, allows users to access climate change information and visualize the climate impacts for different geographic areas. The Climate Wizard provides a map presentation of historic as well as state-of-the-art projections of temperature and rainfall data. It can also provide climate analysis tailored to the needs of a specific decision-making process and metrics for interpreting climate risks for the specific sectors, including agriculture. These metrics include the agro-economic impacts of climate change, such as total precipitation, dry conditions, extreme hot and cold temperatures, and growing degree days.

The [MarkSim™ DSSAT weather file generator](#) is a platform that helps users generate simulated daily weather data across the globe. It can deliver information about rainfall, maximum and minimum temperatures and solar radiation, and has been specifically designed for tropical countries. The tool can be used to generate daily data for multiple years that are characteristic of future climate for any point in the world. The tool generates climate information that can be used in agricultural climate impact models.

MOSAICC ([Modelling System for Agricultural Impacts of Climate Change](#)) is an initiative by FAO that integrates multidisciplinary models to capture different aspects of the impacts of climate change on agriculture. A detailed description of the model system can be found in [module C.10](#).

Identification and appraisal of climate-smart agriculture investment opportunities

The identification of appropriate climate-smart agriculture interventions as part of agricultural investment programmes and projects requires an examination of a wide range of available options and trade-offs at the implementation stage, from the farm level to national decision-making levels. There are a number of tools and methodologies that can be used to support the decision-making process for the appraisal and prioritization of climate-smart agriculture interventions in agricultural investment plans and projects.

Comprehensive Africa Agriculture Development programme (CAADP), which is owned and led by African governments, was developed to help countries reach and sustain higher economic growth through agriculture-led development. To achieve these goals, National Agriculture and Food Security Investment Plans (NAFSIPs) have been prepared by a number of countries. These plans provide the opportunity to scale up of climate-smart agriculture practices that benefit national development, food security and climate change adaptation and mitigation. A summary of the methodological framework that has been developed for examining the potential of the NAFSIPs to generate climate change benefits is presented in Box C4.7.

Box C4.7 Identifying the potential for climate-smart agriculture investments in NAFSIPs

FAO has developed a methodology for CAADP to identify the potential for climate-smart agriculture investments in CAADP countries. The methodology involves performing several tests on NAFSIPs:

- **The degree to which the planned investments are climate smart:** This test consists of screening each subprogramme of the NAFSIP on the potential contribution of the planned activities to climate adaptation and mitigation. The screening results are synthesized through an index describing the total potential climate benefits that may be obtained from the implementation of the investment plan.
- **Climate-smart agriculture investment priority areas:** The NAFSIPs are examined from the point of view of the resources allocated to investment areas that are considered strategic priorities for climate-smart agriculture including production, value chain chains, research and capacity

building, infrastructure, institutional support and disaster risk management. The test also analyses if the NAFSIP contributes to NAPAs, which are in turn a prioritization mechanism to identify urgent and immediate national adaptation needs.

- **National policy environment for climate-smart agriculture investments:** This test examines the consistency of the NAFSIP's climate-smart activities with policies and development strategies and plans in the agriculture sectors; the existing evidence of the successful scaling up of climate-smart agriculture practices; the strengths and weaknesses of the institutional capacity of the agricultural sectors with regard to implementation. The test is in fact a rapid qualitative assessment based on the expert analysis and judgment. The policy environment then is ranked from 'low' to 'high' based on the perceived notion if the existing policy environment is conducive to scaling up CSA interventions.

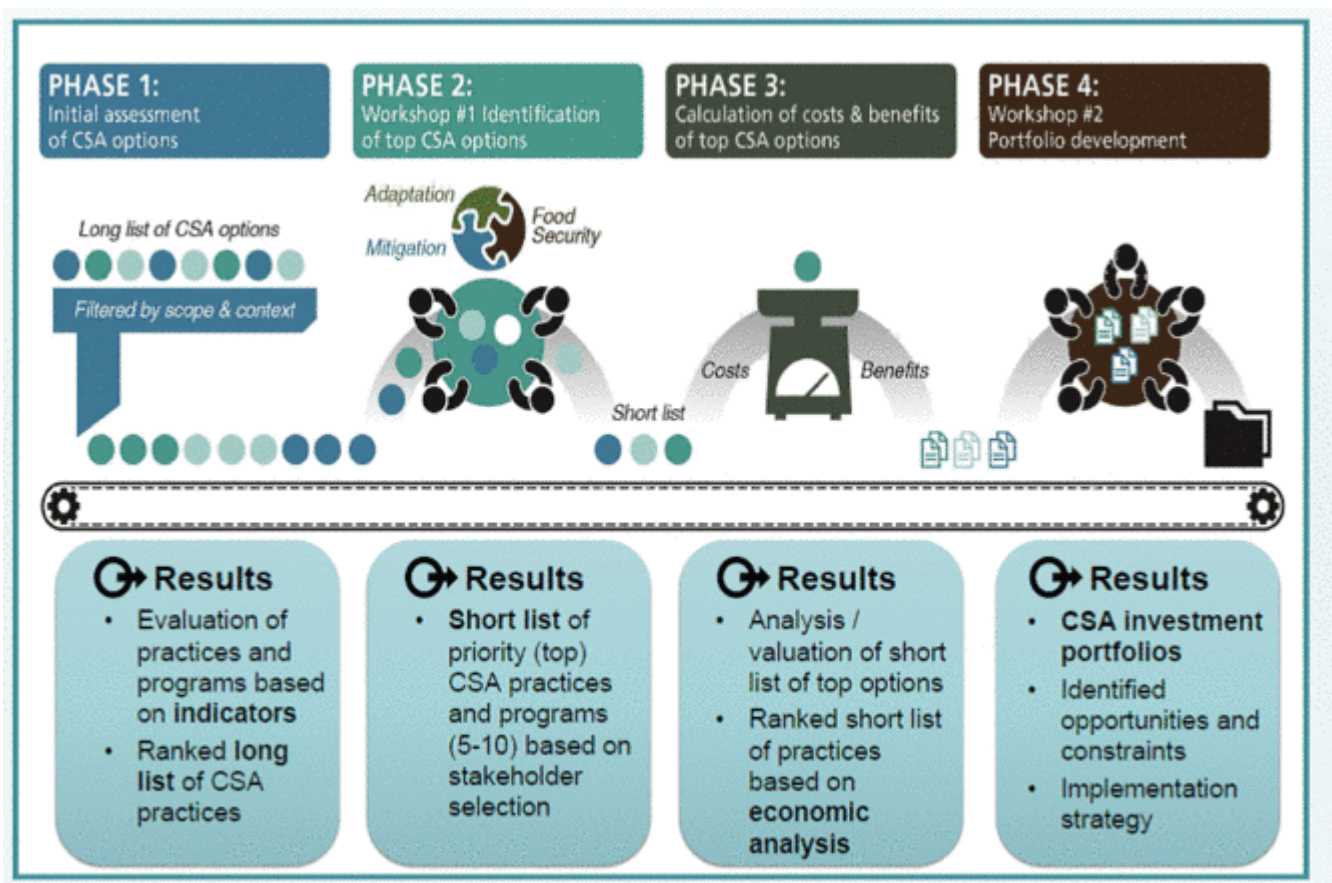
The next step of the methodology is an in-depth investments analysis focusing on a preliminary estimation of the costs and benefits of promising climate-smart options; identification of financing options, including climate finance; and preliminary planning of programme components and activities for early action.

Source: FAO, 2012b

The [Climate-Smart Agriculture Prioritization Framework](#), which was developed by CIAT and CCAFS, is designed to help decision-makers identify climate-smart agriculture investment portfolios that can achieve gains in food security, build farmers' resilience to climate change, and lead to low-emission development of the agriculture sectors. The framework, which is a stakeholder-driven process, has four phases: the initial assessment of climate-smart agriculture options; the identification of the most suitable options through workshops; the calculation of cost and benefits of the most suitable options; and the development of a portfolio of options with an evaluation of the barriers to their adoption (see Figure C4.3).

So far only a few initiatives that have used the Prioritization Framework have reached the implementation stage. The most complete experience with the application of the Prioritization Framework has been in Mali where it was used to provide evidence-based decision-support to identify climate-smart agriculture investment priorities. The 12 month-process, which involved around 30 decision-makers from the national government, district authorities, academia, international and national research institutions, non-governmental organizations and donors, led to the implementation of prioritized practices in research and development programmes and the request for support to mainstream climate-smart agriculture by the Ministry of Agriculture and the Parliament (Andrieu, 2017). The experience with Climate-smart Agriculture Prioritization Framework in Mali, as well as in Colombia and Guatemala, has demonstrated that it is critical for decision-makers, planners and implementers to gain a better understanding of approaches for achieving agricultural development in ways that takes into account productivity, resilience, and mitigation; and how progress in this area can be realized by scaling up successful climate-smart agriculture practices and integrating climate-smart agriculture priorities into ongoing agricultural programmes.

Figure C4.3. Overview of different phases of the Climate-smart Agriculture Prioritization Framework



Source: Andrieu et al., 2017

Participatory prioritization of CSA investment interventions: SHARP

For developing effective CSA solutions to be mainstreamed into investment design and implementation, it is important to consider stakeholder priorities and get an idea of the options, costs and expected benefits of CSA adaptation measures at farm and community levels. This approach requires methodologies that are based on participatory appraisal methods and the [Self-evaluation and Holistic Assessment of climate Resilience of farmers and Pastoralists \(SHARP\)](#) tool developed jointly by FAO and external partners, may be recommended as one of them (FAO, 2015). Please see [module C6](#).

Economic appraisal of climate-smart agriculture solutions: impact on carbon balance

The [EX-Ante Carbon-balance Tool \(EX-ACT\)](#), developed by FAO, can be used for the economic analysis of agriculture investment projects to value the mitigation potential of investment options. For more detailed description please refer to [module C8](#).

The [CCAFS Mitigation Options Tool \(CCAFS-MOT\)](#) estimates greenhouse gas emissions from multiple crop and livestock management practices in different geographic regions. It gives policy-makers access to reliable information needed to make science-informed decisions about emissions reductions from agriculture. CCAFS-MOT combines several empirical models to estimate greenhouse gas emissions from different land uses and considers mitigation practices that are compatible with food production. In addition to the traditional greenhouse gas calculators available for calculating emissions from either single crops or whole farms, CCAFS-MOT also allows for a ranking of the most effective mitigation options for 34 different crops according to their mitigation

potential and in relation to current management practices and spatially-linked climate and soil characteristics.

Monitoring and evaluation of investment implementation results

Monitoring and evaluation is an important part of managing the implementation of climate-smart agriculture investment projects. The monitoring and evaluation system needs to be designed and implemented to measure progress towards the achievement of the climate-smart agriculture's three interlinked objectives. Activities include developing results frameworks, setting baselines, defining indicators, measuring progress on an ongoing basis and evaluating successes and setbacks. These activities provide crucial information for learning from the implementation of climate-smart agriculture interventions. There are a number of methodologies and tools that can be used for the monitoring and evaluation of climate-smart agriculture interventions, and they are discussed in detail in [module C9](#) - programme and project monitoring and evaluation.

Conclusions

Investments in climate-smart agriculture can deliver high economic returns by increasing agricultural productivity and rural incomes, improving food security, building the adaptive capacity of vulnerable communities and reducing or removing greenhouse gas emissions.

Most financing for agricultural development comes from domestic public and private sources. Even though only a small proportion of these investments come from international public finance, if leveraged correctly, they can catalyze greater public funding from agriculture budgets and private investments for climate-smart agriculture. For many countries, learning how to access and effectively use international financing can play a critical role in making the long-term transition towards climate-smart agriculture.

A systematic integration of climate-smart agriculture considerations into agricultural strategies and plans, and mainstreaming climate-smart agriculture into the design, appraisal, and implementation monitoring and evaluation of rural development programmes and projects is required to ensure the effective use of available financing. The practical tools and approaches presented in this module are available for mainstreaming climate-smart agriculture into each stage of the agricultural investment decision-making process. Carrying out more studies and analyses, learning from experience and sharing knowledge on integrating climate-smart agriculture approaches into broader agricultural investment strategies are needed to maximize the economic efficiency of investments and scale up climate-smart agriculture.

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Annex 1: Multilateral Climate Finance Mechanisms

Multilateral Climate Finance

Fund	Purpose	Administering entity	Implementing entities	Type of Financing	Funding	Purpose and eligibility criteria
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Multilateral Climate Finance

Adaptation Fund (AF)	Adaptation	Adaptation Fund Secretariat; Board approves projects	National, regional and multilateral implementing entities. As of September 2017, there are 25 national, 6 regional and 12 multilateral implementing entities.	Grants	Primary funding comes from a 2% share of proceeds of the Certified Emission Reductions issued by Kyoto Protocol's Clean Development Mechanism.	AF designed to finance climate change adaptation projects and programs based on the priorities of eligible developing countries as identified in their National Adaptation Plans (NAPs). Agriculture, food security, nutrition, water management and CSA are high priorities. Finances the incremental costs of measures to achieve global environmental benefits. CSA specifically covered in the GEF-6 Climate Change and Land Degradation Focal Areas. GEF-7 will likely continue to promote synergies and deliver multiple benefits across GEF focal areas as well as through new Impact Programs (IPs) which will provide support particularly to agriculture, food security and forestry. Resources combinable with LDCF and SCCF.
Global Environment Facility (GEF)	Mitigation	Managed by the GEF Secretariat. Funds Projects approved by GEF Council.	Funds can be accessed through 18 GEF Agencies	Grants, non-grant instruments	Replenished every four years. GEF-6 Replenishment for the period 2014-2018 amounted to USD 4.43 billion.	Replenished every four years. GEF-6 Replenishment for the period 2014-2018 amounted to USD 4.43 billion.

Multilateral Climate Finance

Green Climate Fund (GCF)	Adaptation, Mitigation 50/50	Managed by the GCF Secretariat and projects approved by the GCF Board.	Funds can be accessed through national, regional and international accredited entities. As of September 2017, there are 54 accredited entities comprised of 24 are direct access, 8 private sector and 22 international entities.	Grants, loans, guarantees, equity,	USD 10.3 billion initially mobilized for the period 2015-2018.	Investments in the agricultural sectors well aligned with GCF priorities. Four of its eight strategic results areas are directly linked to the agriculture sectors: reducing emissions from deforestation, forest degradation and land use (mitigation); and three adaptation priorities – increasing resilience of health, food and water security; livelihoods of people and communities; and ecosystems and ecosystems services.
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Multilateral Climate Finance

[Least Developed Countries Fund \(LDCF\)](#)

Adaptation

Managed by the GEF Secretariat.

Funds can be accessed through 18 GEF Agencies

Grants

Replenished on a rolling basis. New pledges accepted on ongoing basis.

Tasked with financing the preparation and implementation of National Adaptation Programs of Action (NAPAs). Supports NDC implementation. Agriculture and food security, water resources management, disaster risk management, natural resources management, among thematic programming areas. Equitable access for all LDCs: “ceiling” increases proportionately to the growing size of the fund. Funds combinable with GEF, SCCF.

[Special Climate Change Fund](#)

Adaptation

Managed by the GEF Secretariat.

Funds can be accessed through 18 GEF Agencies

Grants

Replenished on a rolling basis

SCCF funds same thematic programme areas as LDCF. While adaptation is a top priority, through a separate financing window the SCCF also supports the transfer of climate-resilient technology for both adaptation and mitigation, including in the areas of agriculture, forestry and water management. Funds combinable with GEF, LDCF.

Multilateral Climate Finance

Other multilateral funds

[Adoption for
Smallholder
Agriculture
Programme
\(ASAP\)](#)

Adaptation

International
Fund for
Agricultural
Development
(IFAD)

IFAD

Grants

Multi-donor
Trust Fund
(Belgium,
Canada,
Finland,
Netherlands,
Norway,
Sweden,
Switzerland, and
United
Kingdom)

ASAP aims to improve the climate resilience of large-scale rural development programmes and improve the capacity of at least 8 million smallholder farmers to expand their options in a rapidly changing environment. Through ASAP, successful “multiple-benefit” approaches are scaled up which can increase agricultural output while reducing and diversifying climate-related risks.

Multilateral Climate Finance

African Climate Challenge Fund (ACCF)	Adaptation, Mitigation	Climate Change and Green Growth Department of the African Development Bank (AfDB),	AfDB	Grants	Multi-donor Trust Fund (Germany, Italy, Flander, Belgium)	ACCF supports African countries and complements existing resources and trust funds. Aims to scale-up mobilization of international climate finance dedicated to support African countries to transition towards climate-resilient, low carbon economies and green growth, including through readiness activities. Supports broad range of activities, including: preparation for accessing climate funding; integration of climate change and green growth into strategic documents and/or projects; preparation and funding of adaptation and mitigation projects; climate change-related knowledge management and information sharing; capacity building;
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Multilateral Climate Finance

Participants investing in the BioCarbon Fund include six governments and public entities and 11 private companies. Private sector participants include oil & gas, utilities, food & beverage, iron & steel, chemicals & pharmaceuticals, and agriculture. The emission reductions that the BioCarbon Fund purchases on behalf of its Participants are subsequently transferred to them pro-rata their financial participation in the fund.

The BioCarbon Fund is a public-private sector initiative managed by the World Bank and supports projects that generate multiple revenue streams, combining financial returns from the sale of emission reductions (i.e., carbon credits) with increased local incomes and other indirect benefits from sustainable land management practices.

Multi-donor Trust Fund: USD 8.3 billion are expected to attract an additional USD 58 billion of co-financing for a portfolio of over 300 projects and growing

CIF consists of funds - CTF and SCF. Four key programs (CTF, FIP, PPRC, SREP - see below) that help 72 developing countries pilot low-emission, climate resilient development.

[Biocarbon Fund](#)

Mitigation World Bank World Bank Carbon Finance

[Climate Investment Fund \(CIF\)](#)

Mitigation World Bank and MDBs World Bank and MDBs Concessional financing

Multilateral Climate Finance

Clean Technology Fund (CTF)	Mitigation	World Bank	AfDB, ADB, EBRD, IDB, World Bank Group	Concessional financing	Multi-donor Trust Fund under CIF: USD 5.6 billion.	<p>Part of CIF. Provides middle-income countries with highly concessional resources to scale up the demonstration, deployment, and transfer of low carbon technologies in renewable energy, energy efficiency, and sustainable transport.</p>
Strategic Climate Fund (SCF)	Adaptation, Mitigation	World Bank	AfDB, ADB, EBRD, IDB, World Bank Group	Concessional financing	Multi-donor Trust Fund under CIF	<p>The SCF is one of the two funds of the CIF. It serves as an overarching framework to support three targeted programs - FIP, PPRC and SREP - with dedicated funding to pilot new approaches with potential for scaled-up, transformational action aimed at a specific climate change challenge or sectoral response.</p>

Multilateral Climate Finance

Pilot Program for Climate Resilience (PPCR)	Adaptation	World Bank	AfDB, ADB, EBRD, IDB, World Bank Group	Concessional financing	USD 1.2 billion programme under CIF	<p>Part of CIF. The first program under the SCF to become operational. Its objective is to pilot and demonstrate ways to integrate climate risk and resilience. It also provides additional funding to put plan into action and pilot innovative public and private sector solutions to pressing climate-related risks.</p>
Scaling Up Renewable Energy Program (SREP) in Low Income Countries	Mitigation	World Bank	AfDB, ADB, EBRD, IDB, World Bank Group	Concessional financing	USD 780 million programme under CIF	<p>Part of CIF. It aim at demonstrating the social, economic, and environmental viability of low carbon development pathways in the energy sector. It seeks to create new economic opportunities and increase energy access through the production and use of renewable energy.</p>

Multilateral Climate Finance

[Climate-Smart Agriculture Fund for Latin America and the Caribbean \(CSAF\)](#)

Mitigation, Adaptation

Inter-American Development Bank (IADB)

Inter-American Development Bank (IADB)

Grants

Multi-donor Trust Fund (IADB, GEF, Nordic Development Fund)

The CSAF aims to scale up climate-smart agriculture practices to achieve carbon sequestration, resilience to climate change and improved provision of ecosystem services by leveraging private sector investment in sustainable agriculture, forestry, and rangeland systems.

REDD-plus funds

[Amazon Fund](#)

Mitigation

Brazilian Development Bank (BNDES)

BNDES

Grants

Multi-donor Trust Fund (Norway, Germany - KfW, Petrobras)

The Amazon Fund supports investments in the following areas: management of public forests and protected areas; environmental control, monitoring and inspection; sustainable forest management; economic activities created with sustainable use of the vegetation; eEcological and economic zoning, territorial arrangement and agricultural regulation; preservation and sustainable use of biodiversity; and recovery of deforested areas.

Multilateral Climate Finance

Congo Basin Forest fund (CBFF)	Mitigation	African Development Bank (AFDB)	AfDB	Grants	<p>Multi-donor Trust Fund (Norway, UK). Contributions USD 170 million; USD 15 million committed to projects.</p>	<p>"Supports COMIFAC and its subregional partner institutions to mobilize resources to finance activities and projects aimed at promoting the equitable and sustainable use, conservation and management of the Congo Basin forests and ecosystems for poverty alleviation, sustainable social-economic development, regional cooperation and environmental conservation. Thematic areas: forest management and sustainable practice; Livelihoods and economic development; monitoring, assessment and verification; benefits from carbon markets and payment for ecosystem services; capacity building in REDD</p>
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Multilateral Climate Finance

[Forest Carbon Partnership Facility \(FCPF\)](#)

Mitigation

World Bank

The World Bank assumes the functions of trustee and secretariat. The World Bank, the Inter-American Development Bank and United Nations Development Programme are Delivery Partners under the Readiness Fund and responsible for providing REDD+ readiness support services to distinct countries.

Grants, performance-based payments

Multi-donor Trust Fund (18 donors and 47 REDD+ partners)

Global partnership of governments, businesses, civil society, and Indigenous Peoples focused on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests, and the enhancement of forest carbon stocks in developing countries (activities commonly referred to as REDD+). Consists of a Readiness Fund that provides technical assistance and supports tropical and sub-tropical developing countries to prepare for future, large-scale, system of positive incentives for REDD+. A Carbon Fund provides results-based finance for emission reductions.

Multilateral Climate Finance

Forest Investment Program (FIP)	Mitigation	World Bank	AfDB, ADB EBRD, IDB, World Bank Group	Concessional financing	USD 775 million programme under CIF	Part of CIF one of the three funds under the Strategic Climate Fund. The FIP aims to support developing countries' efforts to reduce emissions from deforestation and forest degradation by providing scaled-up financing for readiness reforms and public and private investments. It finances programmatic efforts to address the underlying causes of deforestation and forest degradation and to overcome barriers.
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Multilateral Climate Finance

UN Reducing Emissions from Deforestation and Forest Degradation (UN-REDD*)	Mitigation	<p>UN-REDD Programme Executive Board has general oversight for the Programme, taking decisions on the allocation of the UN-REDD Programme fund resources.</p>	<p>UNDP, FAO, UNEP partnership</p>	Grants	<p>Multi-donor Trust Fund</p>	<p>"Purpose of UN-REDD+ is to reduce forest emissions and enhance carbon stocks in forests while contributing to national sustainable development. UN-REDD+ assists countries to develop capacities to meet UNFCCC REDD+ requirements in order to receive results-based payments. UN-REDD+ Programme provides (i) direct support to the design and implementation of National REDD+ Programmes; (ii) complementary tailored support to national REDD+ actions; and (iii) technical capacity building support through sharing of expertise, common approaches, analyses, methodologies, tools, data, best practices and facilitated South-South knowledge sharing."</p>
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Acronyms

	Asian Development Bank
ADB	African Development Bank
AfDB	Adaptation for Smallholder Agriculture Programme
ASAP	Comprehensive Africa Agriculture Development programme
CAADP	Tropical Agricultural Research and Higher Education Center
CATIE	CGIAR Research Program on Climate Change, Agriculture and Food Security
CCAFS	CCAFS Mitigation Options Tool
CCAFS-MOT	International Center for Tropical Agriculture
CIAT	Climate Investment Fund
CIF	Climate-Smart Agriculture Fund for Latin America and the Caribbean
CSAF	European Bank for Reconstruction
EBRD	Development the European Investment Bank
EIB	Green Climate Fund
GCF	Global Environmental Facility
GEF	Inter-American Development Bank
IDB	International Fund for Agricultural Development
IFAD	Intended National Contribution
INC	Least Developed Countries Fund
LDCF	multilateral development banks
MDB	national climate funds
NCF	National Agriculture and Food Security Investment Plans
NAFSIP	Nationally Appropriate Mitigation Action
NAMA	National Adaptation Plan
NAP	National Adaptation Programmes of Action
NAPA	Pilot Program for Climate Resilience
PPCR	reduce emissions from deforestation and forest degradation, and strengthen the role of
REDD+	conservation and sustainable management of forests to enhance of forest carbon stocks
SCCF	Special Climate Change Fund
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest
USAID	Degradation in Developing Countries United States Agency for International Development

References

African Development Bank (AfDB), Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Islamic Bank Development (IDBG) & World Bank Group (WBG). 2016. [*Joint Report on Multilateral Development Banks' Climate Finance*](#).

Andrieu, N., Sogoba, B., Zougmore, R., Howland, F., Samake, O., Bonilla-Findji, O., Lizarazo, M., Nowak,

- A., Dembele, C. & Corner-Dolloff, C.** 2017. Prioritizing investments for climate-smart agriculture: Lessons learned from Mali. *Agricultural systems*, 154:13-24.
- Buchner, B.K., Trabacchi, C., Mazza, F., Abramskiehn, D. & Wang, D.** 2015. *Global Landscape of climate finance 2015*. Venice, Italy, Climate Finance Initiative.
- FAO.** 2012a. Agriculture in National Adaptation Programmes of Action (NAPA). In *Building resilience for adaptation to climate change in the agriculture sector*. Proceedings of a joint FAO/OECD Workshop. Rome.
- FAO.** 2012b. *Identifying Opportunities for Climate Smart Agriculture in Africa*. Rome.
- FAO.** 2015. *Self-evaluation and holistic assessment of climate-resilience of farmers and pastoralists*. Rome.
- FAO.** 2016. *State of Food and Agriculture: Climate Change, Agriculture, and Food Security*. Rome.
- FAO.** 2017. [Addressing Agriculture, Forestry, and Fisheries in National Adaptation Plans](#). Rome.
- Global Environment Facility (GEF).** 2017. [GEF-7 Replenishment: Second Meeting for the Seventh Replenishment of the GEF Trust-Fund](#). GEF/R.7/06 Draft 2017-09-12.
- International Fund for Agricultural Development (IFAD).** 2016. *The Economic Advantage: assessing the value of climate change actions in agriculture*. Rome.
- Organisation for Economic Co-operation and Development (OECD).** 2012. *OECD environmental outlook to 2050: the consequences of inaction*. Paris.
- OECD.** 2015. *The Economic consequences of climate change*. Paris.
- Sain, G., Loboguerrero, A.M., Corner-Dolloff, C., Lizarazo, M., Nowak, A., Martinew-Baron, D. & Andrieu, N.** 2017. *Costs and benefits of climate smart agriculture: the case study of the dry corridor in Guatemala*. *Agricultural Systems*, 151: 163-173.
- Sellare, J.** 2016. [Are climate-smart agriculture practices economically desirable?](#) Tropical Agricultural Research and Higher Education Center (CATIE).
- Stern, N.** 2014. *Growth, climate and collaboration: towards agreement in Paris 2015. Policy Paper*. London, Centre for Climate Change Economics and Policy and Grantham Research Institute on Climate Change and the Environment.
- Trerup S. & Olhoff, A.** 2011. *Climate risk screening tools: a guide to guidance*. Technical university of Denmark,

Copenhagen.

United Nations Development Programme (UNDP). 2015. *Budgeting for climate change: how governments have used national budgets to articulate a response to climate change.* Bangkok.

UNDP. 2010. *Screening tools and guidelines to support the mainstreaming of climate change adaptation into development assistance – a stocktaking report.* New York.

United Nations Framework Convention on Climate Change (UNFCCC). 2015. [NAMA Registry](#).

UNFCCC. 2016. *Focus: Mitigation – NAMAs, Nationally Appropriate Mitigation Actions.*

World Bank. 2010. *Vietnam: economics of adaptation to climate change.* Washington, DC.

World Bank. 2013. *Guidance Notes on Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resource Management Projects.* Washington, DC.

World Bank. 2014. *Climate Change Public Expenditure and Institutional Review Sourcebook.* Washington, DC.