

# Accelerating Climate-Resilient and Low-Carbon Development

## *Africa Climate Business Plan Third Implementation Report & Forward Look*

November 2018

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AFRICA REGION

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A woman sells nuts and fruit at a market in Côte d'Ivoire. WB technical assistance supports climate smart agriculture and robust value chains. (Roman Yanushevsky/Shutterstock)



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Children play while getting water from a borehole pump, allowing them more time to study and play instead of fetching water. (Ricardo Mayer/Shutterstock)



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# Abbreviations

All dollar amounts are US dollars unless otherwise indicated.

<b>AAA</b>	Adaptation of African Agriculture to Climate Change
<b>ACBP</b>	Africa Climate Business Plan
<b>ACP</b>	Africa Caribbean Pacific
<b>ACRIS</b>	Africa Climate Resilient Infrastructure Summit
<b>ADRF</b>	Africa Disaster Risk Financing Initiative
<b>AFD</b>	Agence Française de Développement/French Development Agency
<b>AFDB</b>	African Development Bank
<b>AFR100</b>	Africa Forest Landscape Initiative
<b>AFRI-RES</b>	Africa Climate-Resilient Investment Facility
<b>ASA</b>	Advisory Services and Analytics
<b>AUC</b>	African Union Commission
<b>BAU</b>	Business as usual
<b>BHES</b>	Batoka Gorge Hydro Electricity Scheme
<b>BRT</b>	Bus rapid transit
<b>CAFI</b>	Central African Forest Initiative
<b>CAPE</b>	Climate Action Peer Exchange
<b>CAT-DDO</b>	Catastrophe-Deferred Drawdown Option
<b>CCA</b>	Climate Change Adaptation
<b>CCAFS</b>	Climate Change, Agriculture and Food Security
<b>CCAP</b>	Climate Change Action Plan
<b>CDC</b>	Centres for Disease Control and Prevention (Africa)
<b>CDD</b>	Community-driven development
<b>CIF PPCR</b>	Climate Investment Fund Pilot Program for Climate Resilience
<b>CIWA</b>	Cooperation for International Waters in Africa
<b>CMU</b>	Country Management Unit
<b>COP</b>	Conference of Parties
<b>COREP</b>	Gulf of Guinea Regional Fisheries Commission
<b>CPF</b>	Country Partnership Framework
<b>CREWS</b>	Climate Risk Early Warning System
<b>CRIP</b>	Climate Resilience Investment Plan
<b>CSA</b>	Climate-Smart Agriculture
<b>CSAIP</b>	Climate-Smart Agricultural Investment Plan
<b>CSE</b>	Ecological Monitoring Center
<b>CSIP</b>	Climate-Smart Strategies and Investment Plan
<b>DAMS</b>	Data Analysis and Monitoring System
<b>DFID</b>	Department for International Development
<b>DLI</b>	Disbursement Linked Indicator
<b>DPL</b>	Development Policy Loan
<b>DPO</b>	Development Policy Operation
<b>DRDIP</b>	Development Response to Displacement Impacts Project



<b>DSS</b>	Decision support system
<b>ECCAS</b>	Economic Community of Central African States
<b>ECOWAS</b>	Economic Community of West African States
<b>ECRAI</b>	Enhancing the Climate Resilience of Africa's Infrastructure
<b>EO</b>	Earth observation
<b>EO4SD</b>	Earth Observation for Sustainable Development
<b>ERPA</b>	Emission Reductions Payment Agreement
<b>ESMAP</b>	Energy Sector Management Assistance Program
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FCI</b>	Finance, Competitiveness, and Innovation
<b>FCPF</b>	Forest Carbon Partnership Facility
<b>FIP</b>	Forest Investment Program
<b>FITI</b>	Fisheries Transparency Initiative
<b>GCF</b>	Green Climate Fund
<b>GDP</b>	Gross domestic product
<b>GEF</b>	Global Environment Facility
<b>GEF LDCF</b>	Global Environment Facility Least Developed Countries' Fund
<b>GFDRR</b>	Global Facility for Disaster Reduction and Recovery
<b>GHG</b>	Greenhouse gases
<b>GIIF</b>	Global Index Insurance Facility
<b>GIZ</b>	German Society for International Cooperation
<b>GP</b>	Global Practice
<b>GSURR</b>	Global Practice for Social, Urban and Rural Development, and Resilience
<b>HCI</b>	Human Capital Index
<b>HCP</b>	Human Capital Project
<b>HNP</b>	Health, Nutrition, and Population
<b>HPC</b>	High priority country
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>ICC</b>	Interregional Coordination Center
<b>ICLEI</b>	International Council for Local Environmental Initiatives
<b>ICPAC</b>	International Climate Prediction, Applications Centre
<b>ICT</b>	Information and communications technology
<b>IDA</b>	International Development Association
<b>IFAD</b>	International Fund for Agricultural Development
<b>IFC</b>	International Finance Corporation
<b>IGAD</b>	Intergovernmental Authority on Development
<b>ILM</b>	Integrated Landscape Management
<b>ILRI</b>	International Livestock Research Institute
<b>IOTC</b>	Indian Ocean Tuna Commission
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IPF</b>	Investment project financing
<b>ISFL</b>	Initiative for Sustainable Forest Landscapes
<b>IUCN</b>	International Union for the Conservation of Nature
<b>IWRM</b>	Integrated Water Resources Management
<b>JICA</b>	Japan International Cooperation Agency

<b>JOTC</b>	Joint Operational Technical Committee
<b>LIC</b>	Low-income country
<b>LIDAR</b>	Light Detection and Ranging
<b>LPC</b>	Low priority country
<b>LSIPT</b>	Livestock Sector and Investment Policy Toolkit
<b>LVEMP</b>	Lake Victoria Environment Management Program
<b>LVTP</b>	Lake Victoria Transport Program
<b>M&amp;E</b>	Monitoring and evaluation
<b>MDTF</b>	Multi-Donor Trust Fund
<b>MFD</b>	Maximizing Finance for Development
<b>MPC</b>	Moderate priority country
<b>MSP</b>	Maritime spatial planning
<b>NAPA</b>	National Adaptation Programme of Action
<b>NARIGP</b>	National Agriculture and Rural Inclusive Growth Project
<b>NBA</b>	Niger Basin Authority
<b>NDC</b>	Nationally Determined Contribution
<b>NDF</b>	Nordic Development Fund
<b>NGO</b>	Nongovernmental Organizations
<b>NMHS</b>	National meteorological and hydrological services
<b>NRM</b>	Natural Resource Management
<b>NST 1</b>	National Strategy for Transformation
<b>NUSAF</b>	Northern Uganda Social Action Fund
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>P4R</b>	Program for Results
<b>PAP</b>	Priority Action Plan
<b>PDO</b>	Project Development Objective
<b>PFORR</b>	Program for Results
<b>PIDA</b>	Program for Infrastructure Development
<b>PIDACC</b>	Integrated Development and Climate Change Adaptation Program in the Niger Basin
<b>PNDES</b>	National Social and Economic Development Plan
<b>PPIAF</b>	Public-Private Infrastructure Advisory Facility
<b>PROFOR</b>	Program on Forests
<b>PSNP</b>	Productive Safety Net Program
<b>RABIT</b>	Resilience Assessment Benchmarking and Impact Toolkit
<b>RECP</b>	Resource efficiency and cleaner production
<b>REDD+</b>	Reducing emissions from deforestation and forest degradation
<b>REDISSE</b>	Regional Disease Surveillance Systems Enhancement (West Africa)
<b>REM&amp;EP</b>	Results Monitoring and Evaluation for Resilience-Building Operations Project
<b>RESIP</b>	Resilience Investment Project
<b>RSIF</b>	Regional Scholarship and Innovation Fund
<b>SACIDS</b>	Southern African Centre for Infectious Disease Surveillance
<b>SADC</b>	Southern African Development Community
<b>SAWAP</b>	Sahel and West Africa Program
<b>SCCF</b>	Special Climate Change Fund
<b>SCD</b>	Systematic Country Diagnostic
<b>SDG</b>	Sustainable Development Goal

<b>SERRP</b>	Saint Louis Emergency Recovery and Resilience Project
<b>SIDA</b>	Swedish International Development Corporation Agency
<b>SIIP</b>	Sahel Irrigation Initiative Support Project
<b>SLM</b>	Sustainable Landscape Management
<b>SOP</b>	Series of Projects
<b>SPCR</b>	Strategic Program for Climate Resilience
<b>SPJ</b>	Social Protection and Jobs
<b>SWIOFC</b>	Southwest Indian Ocean Fisheries Commission
<b>SWIOFISH</b>	Southwest Indian Ocean Fisheries Governance and Shared Growth Project
<b>TA</b>	Technical assistance
<b>UHC</b>	Universal health coverage
<b>UMIC</b>	Upper-middle-income country
<b>UNDP</b>	United Nations Development Programme
<b>UNECA</b>	United Nations Economic Commission for Africa
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>UNICEF</b>	United Nations Children’s Fund
<b>USAID</b>	United States Agency for International Development
<b>WACA</b>	West Africa Coastal Areas Management Program
<b>WAEMU</b>	West African Economic and Monetary Union
<b>WARFP</b>	West Africa Regional Fisheries Project
<b>WBG</b>	World Bank Group
<b>WFP</b>	World Food Programme
<b>WHO</b>	World Health Organization
<b>WMO</b>	World Meteorological Organization
<b>ZAMCOM</b>	Zambezi Watercourse Commission
<b>ZAMSTRAT</b>	Zambezi Integrated Water Resources Management Strategy
<b>ZAMWIS</b>	Zambezi Water Resources Information System

# Foreword

We are pleased to share our latest Progress Report on the Africa Climate Business Plan (ACBP), the World Bank's strategic effort to support African governments as they accelerate climate-resilient and low-carbon development.

The good news? We are moving faster than targeted. Between FY16 and FY18, 176 projects, with US\$17 billion in World Bank financing, demonstrates the mobilization of resources ahead of our 2020 targets. The World Bank ACBP is supporting climate action across every sector.

New coastal adaptation projects—such as the West Africa Coastal Areas Management Program (WACA)—will create sustainable livelihoods for marginalized communities already impacted by climate-influenced coastal erosion. Climate-smart agriculture (CSA) in Ethiopia, Niger, and Zambia is increasing food security for rural poor populations. Access to renewable energy is building resilience and boosting productivity with off-grid capacity for solar energy poised to transform rural livelihoods.

But the urgency to step up action is loud and clear: climate impacts are intensifying faster than anticipated, while action on the mitigation front has not been as vibrant.

Africa has contributed the least to global warming, and yet the continent is already experiencing some of the most devastating impacts—from the frequency and length of droughts to unpredictable rainfall and increasing floods, to name a few.

Climate change is pressing and we cannot afford to be complacent. So even as some of the ACBP goals have been met, the stakes are changing, and the ACBP is evolving to stay ahead of these risks. Working together with clients, partners, the private sector, regional organizations, and experts, we remain determined to deliver agile and robust support for climate action in the years to come.



Hafez Ghanem  
World Bank Vice President for Africa









Women cultivate their diversified crops in Burkina Faso.  
(Hector Conesa/Shutterstock)



# Executive Summary

**Sub-Saharan Africa's race to resilience became more urgent with the release of the Intergovernmental Panel on Climate Change (IPCC) 1.5°C Special Report.** The Africa Region must adapt to the 0.5°C warming of the past 50 years, while at the same time prepare for the intensification of climate change impacts. The good news is that the region is not starting from zero; the bad news is that the current pace of climate action is far from adequate.

**The Africa Climate Business Plan (ACBP)<sup>1</sup> has been a galvanizing platform for climate action** since its launch in December 2015, yet it must be even more ambitious in the scale and pace of climate action in the face of a new urgency to manage climate risks and deliver on climate-resilient development. Highlights of the progress up to and including FY18, as well as the main outstanding challenges, are summarized here. The report also highlights successful projects that can be replicated, key lessons learned, and reflections on future strategic directions.

## KEY HIGHLIGHTS

- Between FY16 and FY18 the World Bank has delivered 176 projects and US\$17 billion in International Development Association (IDA) and International Bank for Reconstruction and Development (IBRD) financing for climate-resilient development in Sub-Saharan Africa, under the ACBP, which has exceeded the Bank resource mobilization target set out for 2020.
- These investments are yielding positive outcomes on the ground through innovations in design and financing, and generating critical lessons for transformation and scale-up.
- Focusing primarily on strengthening, powering, and enabling resilience in African countries, the Africa Region registered climate co-benefits of 27 percent in 2018, exceeding the year's regional target of 22 percent and the 25 percent co-benefits in 2017.
- But the race to resilience is getting harder: the current pace of climate action in Sub-Saharan Africa is far from sufficient: the needs are urgent when it comes to both adaptation and preparation for the intensification of climate impacts.
- The World Bank is stepping up its engagement with African countries on their Nationally Determined Contributions (NDCs) to ensure that climate action is mainstreamed into our Country Partnerships Frameworks (CPFs) and project pipelines.

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<sup>1</sup> See the Africa Climate Business Plan website, <http://www.worldbank.org/en/programs/africa-climate-business-plan>.

## KEY HIGHLIGHTS (continued)

- The ACBP proposes to intensify its action and engagement on climate adaptation and resilience in Sub-Saharan Africa through (i) expediting mainstreaming of climate action for transformation at scale; (ii) supporting scaled-up and transformational investments in key sectors, including climate smart health and education, to strengthen health systems and build skills for climate-resilient economies of the future; (iii) harnessing innovation and technology, such as satellite technology, to leapfrog countries for climate resilience; and (iv) raising climate finance and accelerate the mobilization of private sector investment, particularly for renewable energies.

## Portfolio-Level Progress

The ACBP and the wider Sub-Saharan Africa portfolio are making progress in meeting targets of the Plan and corporate climate commitments.

### Resource Mobilization

- In FY18, the World Bank board approved 68 projects, with a Bank commitment of US\$8.21 billion. These projects cover a range of financing instruments, including investment projects, development policies, and programs for results. Between FY16 and FY18, 176 projects and US\$17 billion of Bank financing has been delivered, which is twice the Bank's 2020 resource mobilization target of US\$8.483 billion set out under the ACBP (table ES.1).
- Delivery of resources across all three clusters—strengthening resilience, powering resilience, and enabling resilience—is well on track or ahead of schedule. Adaptation financing reflects about two-thirds of the total mobilized.
- Delivery through financial flows directly handled by the Bank (IDA, IBRD, and the trust funds Global Environment Facility [GEF], Global Facility for Disaster Reduction and Recovery [GFDRR], and carbon finance) is tracked systematically and available through the World Bank's reporting system. Due diligence in tracking the financing leveraged from other sources (such as bilateral agencies, additional multilateral development banks, and the private sector) needs improved monitoring moving forward.
- The pipeline of investments continues to be strong.

**Table ES.1:** World Bank Projects Contributing to ACBP Implementation

Fiscal Year	Semester end	Cumulative number of projects	Cumulative commitments (\$ million)	Resource mobilization against target (\$8.483 billion)	Status against target
<b>Board approved projects</b>					
FY16	December 31, 2015	3	430.0		
	June 30, 2016	33	3,074.6		36 %
FY17	December 31, 2016	53	4,360.7		
	June 30, 2017	108	8,779	25%	103 %
FY18	December 31, 2017	131	11,148		
	June 30, 2018	176	16,997		200 %
<b>Preliminary projections based on pipeline</b>					
FY19	December 31, 2019	269	25,964	50%	
	June 30, 2019	320	32,277		
FY20	December 31, 2019	331	33,994	75%	
	June 30, 2020	335	34,714		

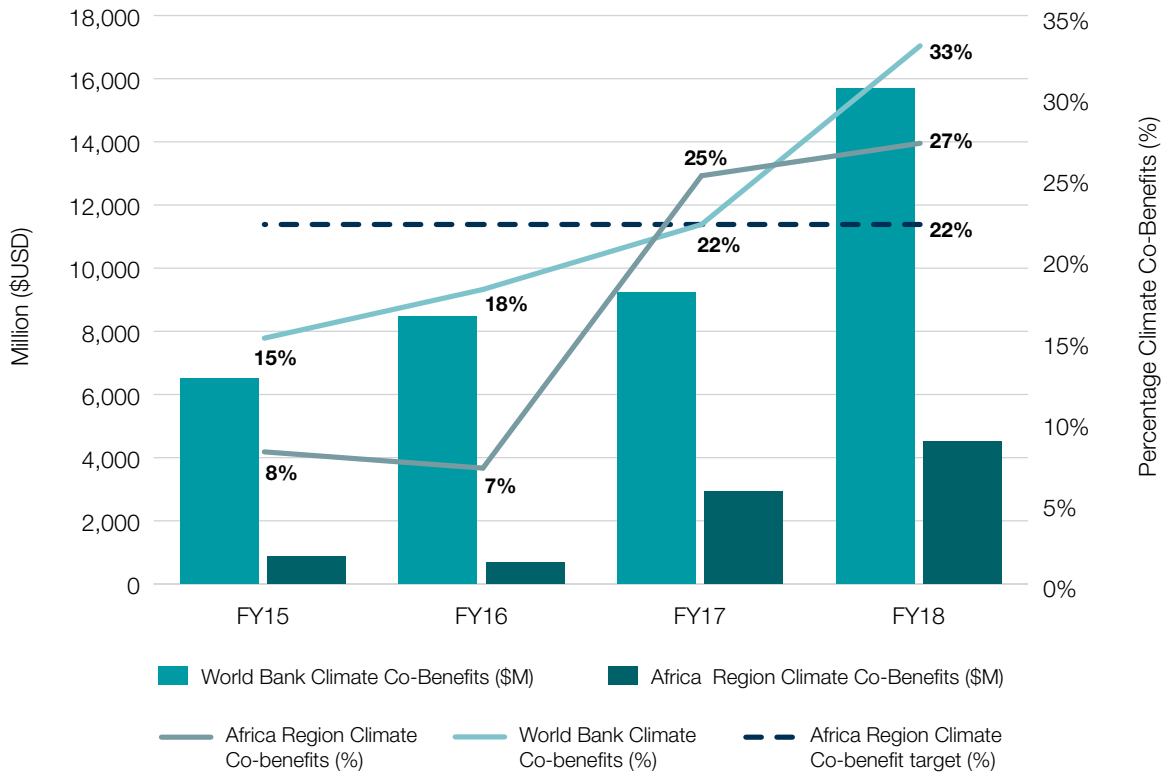
*Note:* Figures for the World Bank Board of Directors-approved projects up to June 30, 2108 (FY18) are final. Figures for the pipeline are estimates and subject to change. The volume of World Bank financing for ACBP projects includes IDA and IBRD (no Trust Funds (TF)).

### Climate Co-Benefits and Other Corporate Commitments

Tracking of the climate mitigation and adaptation co-benefits for Bank financing of projects indicated a historical high of 27 percent for the Africa Region in FY18, surpassing 25 percent in FY17, and higher than the region’s target of 22 percent. The region’s contribution to co-benefits throughout the Bank is significant (figure ES.1). One hundred percent of projects have been screened for climate and disaster risks.

Focused training on the full package of climate commitments—screening, co-benefits, greenhouse gases (GHG), and shadow price—at the Climate Change boot camps (in West and East Africa) and through customized face-to-face training, has increased awareness and capacities of staff and is yielding more effective design and delivery of climate action and co-benefits within investments and policy lending.

**Figure ES.1:** Annual Share of Co-Financing with Climate Co-Benefits for World Bank Financing in Sub-Saharan Africa, FY15-FY18



### Upstream and Downstream Climate Integration

The World Bank Group’s upstream country engagement model consists of (i) a Systematic Country Diagnostic (SCD), which assesses constraints and the steps each country needs to take to achieve the Bank’s twin goals of poverty reduction and shared prosperity; and (ii) a CPF, which lays out the Bank’s program of support to a country, typically over a five-year period. Overall, good upstream strategic integration of climate change risks and opportunities was achieved in the 10 SCDs and three CPFs in FY18:

- Climate is increasingly embedded into more than just the natural resource management focus areas in CPFs; and one CPF (Tanzania) even included an indicator to track climate co-benefits at the country level.
- Both CPFs and SCDs reflect increased linkages with countries’ NDCs submitted under the Paris Agreement—going beyond strategic alignment to address sectoral and multisectoral connections, as well as links with the NDC results framework (e.g., in Guinea).
- Downstream, the ACBP investments increasingly support the implementation of NDCs through 49 investment projects, with links ranging from strategic alignment to design features of projects, to tracking delivery through results frameworks (e.g., the Western Africa Regional Disease Surveillance Systems Enhancement (REDISSE) Phase II, US\$147 million).
- The Bank is working directly with eight client countries on their NDCs, specifically



on adaptation, mitigation, and cross-cutting issues. It is currently supporting Uganda, the first African country to have an NDC Partnership Plan, on systemic shifts to institutionalize change at scale by embedding climate budget tagging and climate risk screening into national processes.

### Resilience Capacity Enhancement

An analysis of the ACBP portfolio reveals that projects are increasing core resilience capacities (86 percent adaptive, 65 percent absorptive, and 20 percent transformative) through their interventions. Well-designed projects bolster the multiple pathways (e.g., through Niger’s climate-smart agriculture [CSA] project and Kenya’s National Agriculture and Rural Inclusive Growth Project [NARIGP]) to build these capacities by embedding concrete resilience attributes (e.g., robustness, preparedness, and redundancy). See Box ES.1 for a description of the World Bank-IFC Lighting Africa program project that provides low-income communities across Sub-Saharan Africa with lighting options.

#### Box ES.1 Lighting Up Low-Income Communities across Sub-Saharan Africa

When Adwoa Adezawa, a young Ghanaian fishmonger, was asked in 2016 about what would help her the most, she said basic community services—especially energy. She wanted light, so her children can read, and refrigeration, so she can sell more of her fish on the occasions when catch is plenty. Two years later, in the summer of 2018, more than 40 million people like her are meeting their basic energy needs through products provided with the support of the joint World Bank-IFC Lighting Africa program. This innovative and far-reaching effort was created just for low-income families like Adezawa’s, with the aim of providing off-grid solar lighting to 250 million people living without a grid connection in Sub-Saharan Africa in the next decade.

Program activities now include support for the productive use of solar (e.g., solar irrigation and milling), community services (e.g., for schools and health centers), super-efficient household appliances (e.g., fans, TVs, household refrigeration), and innovative pay as you go business models that enable rural, low-income populations to access modern clean energy solutions.

The Lighting Africa program has spread across the continent and across the globe—evolving into Lighting Global. Lighting Global is the World Bank Group’s initiative to rapidly increase access to off-grid solar energy for the 1 billion people living without grid electricity around the world. Access to electricity makes people better off—and better able to adapt to climate change.

### Progress of ACBP Components and Introduction of New Components

The ACBP, conceived inclusively, has identified more than a dozen priority areas (business lines) for climate action supporting the three mutually reinforcing resilience clusters: strengthening resilience, powering resilience, and enabling resilience. Table 1.1 highlights the progress made since inception in support of each ACBP component through approved projects, analytical work, and advocacy.

## Strengthening Resilience

This cluster continues to see strong performance through IDA and IBRD resources. Several ACBP components have exceeded expectations, particularly climate-smart agriculture (CSA), integrated watershed management, climate smart cities, and social protection in response to a growing demand for these investments. Social protection projects saw a fivefold increase in delivery, in part due to climate-related impacts and the need for increased resilience support. While ACBP components have seen a strong delivery, the accelerated pace of climate impacts requires stepping up financing and action. A sustained and upscaled focus on existing well-conceived and agreed plans should be prioritized. Equally, the call for *anticipatory planning* (e.g., in strategic multicountry river basins) and more programmatic interventions must be heeded to prevent poor adaptation, leading to increasingly vulnerable and marginalized communities.

Opportunities for carbon sequestration through afforestation, reforestation, and land use options in support of community resilience and ecosystems services are even more compelling as the global community pursues multiple strategies to reduce emissions. Investing in human and social capital focused on social resilience, including through health and education, can help families develop a sturdy social safety net to cope with the threats of climate impacts to their communities.

## Powering Resilience

The Bank has provided direct financing and risk guarantees for a number of solar, hydro, and geothermal power generation projects in this cluster, putting the Bank on track to achieve renewable energy target commitments in the ACBP. Key actors agree that Africa's climate smart development must include planning for a generation mix of fuels to optimize cost and efficiency, as well as to ensure that power utilities are financially viable enough to be creditworthy for private renewable power generation. Regional power interconnections can be strengthened to enable low-cost renewables. The Bank is supporting client governments in Africa to address these broader sector challenges.

## Enabling Resilience

This cluster—a composite of projects, knowledge generation, and capacity building—has a critical role to strengthen overall delivery. Using the Africa Climate-Resilient Investment Facility (AFRI-RES) and other knowledge platforms for analytics and capacity building (e.g., TerrAfrica, Cooperation for International Waters in Africa [CIWA], Program on Forests [PROFOR], and West Africa Coastal Areas Management Program [WACA] Knowledge Platform) can multiply these enabling gains and affect change at scale. Under the AFRI-RES facility, more than a dozen projects across the ACBP components (agriculture, transport, water, cities, and energy) have received dedicated technical assistance to embed climate resilience into the design for shared learning and dissemination. See box ES.2 for a description of the WACA Management Program. See box ES.3 for ways Kenya is being protected in the face of public health emergencies or disasters.

Table ES.2 introduces the new ACBP components (Finance, Competitiveness, and Innovation [FCI]; Education; and Health, Nutrition, and Population [HNP]) and

other areas (Harnessing Satellite Technology for Innovation and Climate Resilience and Strategic Support for NDCs) that need more attention to help deliver concerted climate action in Sub-Saharan Africa.

### **Box ES.2 WACA Management Program**

Amélé Effowe is one of a few Togolese residents clinging to a community being swallowed by the sea. “Before, we had coconut trees,” Effowe said. “We could produce coconut oil. Coastal erosion took away our coconut trees.” It has also taken away homes and livelihoods.

However, West African governments—supported by the World Bank and partners—are beginning to protect and manage the region’s coastal assets. The challenge is massive, requiring investment projects and a scale-up mechanism. The first WACA Resilience Investment Project (ResIP) was approved by the World Bank in April 2018. The financial package includes a credit of US\$190 million from the IDA and a grant of US\$20.25 million from the GEF. WACA ResIP is working with six countries (Benin, Côte d’Ivoire, Mauritania, São Tomé and Príncipe, Senegal, and Togo) and existing regional institutions. The Nordic Development Fund and France has since contributed additional resources, and others are expected to follow.

The investment is urgent: coastal erosion and flooding in West Africa severely threaten people’s communities, livelihoods, safety, and infrastructure. Another innovation is the recently launched WACA Platform, which is mobilizing public, private, and civil society partners to scale up knowledge and crowd in finance for these countries to maximize their resilience.

### **Box ES.3 Protection When Disaster Strikes in Kenya**

Climate change hampers efforts to boost people out of poverty. The US\$200 million Disaster Risk Management Development Policy Financing with Catastrophe Deferred Drawdown Option (Cat DDO) is providing Kenya with rapid access to funding in the event of a disaster or public health emergency, while supporting key reforms that strengthen the country’s ability to manage the impacts of disasters on the economy and the most vulnerable individuals. This project supports the government’s proactive efforts to manage disaster and climate risks with a comprehensive program of reforms that will minimize the burden of economic recovery. The Cat DDO will also support improvements in building the regulatory environment within Kenyan cities.

### **Key Challenges**

Knowledge gaps, capacity, and resource constraints are pressing issues for several of Sub-Saharan countries. Key challenges include the following needs:

- More transformational responses to support deep, systemic shifts (e.g., CSA technologies and practices; addressing drivers of migration).
- Financing to deepen engagement and sustain momentum of climate action (e.g., reducing emissions from deforestation and forest degradation [REDD+], Emission

Reductions Payment Agreements [ERPAs], scaling up off-grid electrification technologies; hydromet programs).

- Rural financing to support rural communities and test innovative mechanisms to crowd in private investment.
- Increased access to innovative technology, including remote sensing and geo-spatial capabilities and data science, for managing and monitoring natural systems (e.g., river basins, agricultural areas, forest systems).
- Upstream analysis to systematically embed climate resilience into sectoral (e.g., transport systems) and multisectoral contexts (e.g., climate smart cities).

## Highlights and Success Stories

The ACBP portfolio has numerous success stories illustrating delivery at the policy, program, and project levels. These investments yield positive outcomes on the ground through innovations in design and financing. Many of these are ripe for scale up and replication. Some illustrative examples:

- The Cashew Value Chain Competitiveness Project in Côte d'Ivoire will directly benefit 225,000 farmers, cashew processors, and traders, as well as rural youth through direct employment, while generating the multiple benefits of CSA.
- As Madagascar prepares for the signing of an Emissions Reduction Payment Agreement, the government's efforts to establish an inclusive and nationally owned forest monitoring system comprising nongovernmental organizations (NGOs), university and research teams, and government ministries is exemplary and replicable.
- Mozambique's Integrated Landscape Management (ILM) Portfolio is maximizing finance for development through mobilizing commercial resources for agriculture and forest value chains, leveraging private equity for protected area management, and promoting partnerships between the private sector and communities.
- The Lake Victoria Transport Project and the Lake Victoria Environmental Management projects are coordinating to manage climate and environmental risks to and from transport development, and to support resilient rural livelihood development through both sustainable natural resources management and improved market access.
- The Senegal–Saint-Louis Emergency Recovery and Resilience Project is seeking to reduce the vulnerability of populations to coastal hazards—to floods that have already reached inside their schools and homes—along the Langue de Barbarie and to strengthen urban and coastal resilience planning of the city of Saint-Louis.
- The Integrated Feeder Roads Development project in Mozambique will increase access to roads where rural poor populations live in relative isolation; it reflects the importance of climate mainstreaming to generate multiplier benefits to the economy and people.
- The recently approved US\$225 million WACA investment program will support six countries and four regional institutions as they reduce climate risks, and will benefit from the recently launched WACA Platform, which will mobilize public, private, and civil society partners for scaling up knowledge and finance.
- As Cameroon starts meeting its energy demand through renewable sources, the Nachtigal Hydropower Project is not only crowding in private capital and reducing public debt but also lowering the overall costs of service for electricity.

- Global Solar Power and Global Wind Atlases completed in 2017 provide quick and easy access for potential project sites to support renewable energy investments.
- The Kenya Catastrophic Disaster Drawdown Option put in place key reforms to strengthen the country's ability to manage disaster and climate risks, with provision for rapid access to funds in the event of disasters.

Scaled-up and robust actions through stepped-up financing and the replication of successful projects are urgent priorities. ACBP support has led to the development of certain dedicated investment plans and bankable projects. These include the Climate Smart Agriculture Investment Plans (Côte d'Ivoire, Lesotho, Mali, Zambia, and Zimbabwe); the Strategic Programs for Climate Resilience (Malawi, Rwanda, and Uganda) under the Pilot Program for Climate Resilience; large-scale programs for performance-based payments for REDD+ and enhanced carbon stocks in 10 countries; the Niger Climate Resilient Investment Plan, and the Strategic Plan for the Zambezi River Basin. Natural ecosystems deliver livelihoods and food security for more than 70 percent of the region's population and continue to demand significant attention.

### Lessons Learned

Lessons are emerging on how best to embed climate resilience and ensure that investments continue to provide durable and sustainable outcomes. Key lessons:

- Dedicated technical assistance for specialized information and technology. This includes (i) access to geospatial information and data analysis to support policy makers and decision making; (ii) moving from reactive to proactive business models on climate-resilient and low-carbon transport, emphasizing transformative core technical work on decarbonization; (iii) identifying opportunities for maritime spatial planning (MSP); and (iv) designing social protection interventions and upstream analysis of transitions to cities for climate resilient buildings, infrastructure, and services.
- Enhanced capacity and development of skills and strategies to advance the work on climate risk management. Examples include (i) capacities to pioneer and advance green competitiveness and innovation for investments to protect industries against climate impacts; (ii) addressing climate change in the health sector and as a cross-cutting sector issue in other sectors; (iii) promoting market system approaches and mobilizing private sector resources for agricultural development; and (iv) leveraging financing to deepen engagement and implementation of large-scale REDD+ performance-based programs.
- Build knowledge by developing a better understanding of the climate-development nexus. These include (i) linkages of climate factors with financial sectors through research, data collection, and dissemination workshops; (ii) financing climate-smart infrastructure and integrating information on climate change issues; (iii) embedding climate change in education curriculum and teacher training; (iv) monitoring impacts of climate induced migration; and (v) addressing the need for mobility as an adaptation strategy.
- Need for systematic and systemic support for climate action to be institutionalized. These shifts, including policy reforms, could lead to (i) improvements in the form and function of African cities; (ii) climate-resilient buildings and stronger building regulations; and (iii) support for strengthening of regional power interconnections to enable low-cost renewables.

## ACBP Forward Look—Strategic Directions

**Several recent World Bank studies underscore the adverse impacts from climate change on ecosystems, livelihoods, and people in Sub-Saharan Africa.**

- *The Changing Wealth of Nations: Building a Sustainable Future* (Lange, Wodon, and Carey 2018) notes that some low-income countries—especially in Sub-Saharan Africa—saw a decline in per capita forest and agricultural land wealth. Degradation of natural resources coupled with the mounting evidence of impacts of climate change—on water, drylands, cities, agriculture, and migration—will have grave consequences on Africa’s development.
- *Uncharted Waters: The New Economics of Water Scarcity and Variability* (Damania et al. 2017) presents evidence on how the impacts of water scarcity and drought may be even greater than previously projected, causing long-term, intergenerational harm in ways that have previously been ignored or inadequately documented. For example, the study reveals that children born during severe droughts in rural Africa suffer adverse health effects throughout their lives with direct consequences for their offspring, who are much more likely to suffer from malnutrition as well.
- *Groundswell: Preparing for Internal Climate Migration* (Rigaud et al. 2018) projects that by 2050, the number of climate migrants in Sub-Saharan Africa could reach up to 86 million (under the pessimistic reference scenario); the region will see an emergence of hot spots of climate in- and climate out-migration as a consequence of lower water availability, loss in crop productivity, and rising sea level and storm surges.

**Climate change and its impacts will interact in multiple and complex ways with other megatrends unfolding in the region.**

- By 2050, Africa will account for the highest population growth—with an additional 1.3 billion people—representing just over half of the added global population (UN 2017). The economic growth in African countries is driven by a surging population, increasing levels of education, and technology absorption. Whether Africa’s demographic surge is a dividend or disaster depends on how governments harness key factors, including the potential of youth and the participation of women in the labor force. Sectors such as agriculture, which have traditionally absorbed the working population, will be increasingly challenged in the face of climate change.
- In Africa, the proportion of undernourished children and those suffering from moderate and severe stunting is projected to increase with climate change, with the most significant increase of 31 percent to 55 percent for severe stunting.
- Power demand will increase to more than 3,100 terawatt hours by 2040; corresponding transport volumes will increase six to eight times, with a particularly strong increase of up to 14 times for some landlocked countries; water needs will push some river basins—including the Nile, Niger, Orange, and Volta—to the ecological brink; information and communications technology (ICT) demand will swell by a factor of 20 before 2020 as Africa catches up with broadband.
- Hydropower capacity is planned to increase by a factor of six, and the irrigated area by 60 percent— but up to 700 percent in some basins (AUC, AfDB, and UNECA 2012).



- With increasing urbanization, urban populations will double over the next 25 years, from 472 million people to nearly 1 billion, as more rural migrants are pushed or drawn to Africa's cities (Lall, Henderson, and Venables 2017).

**Climate action through the ACBP must consider the challenges and opportunities presented by megatrends to support Sub-Saharan African countries in meeting their Sustainable Development Goals (SDGs).** This holistic approach—through low-carbon and climate-resilient strategies—will guard against maladaptation or a lock-in to inflexible adaptation options. Adopting low-carbon pathways will help countries leapfrog toward climate-resilient sustainable development. Building resilience requires a package of interventions—incremental, sequential and transformational—that respond to the uncertainties in which climate impacts may play out in local and regional contexts.

**Anticipatory and proactive strategies are critical to help Africa prepare for climate change.** Investments in human capital—as an aggregation of education, skills, and health—must be cognizant of climate impacts that can undermine the gains across sectors and the economy, and over generations. African economies need long-lasting infrastructure designed to standards that withstand climate impacts and that can ensure delivery of services. These investments will secure and sustain resilience. The region must harness technology for growth and opportunity. For example, while still below the global average of 65 percent, mobile subscriber penetration in Sub-Saharan Africa stood at 44 percent (444 million) by the end of 2017 and is expected to rise to 52 percent by 2050 (Yonazi et al. 2012).

**The ACBP, now in its third year, is a robust platform to fortify and galvanize climate action and chart the future road map.** Building on the challenges, achievements, and lessons learned, the ACBP must focus on deepening engagement and support for transformational and scaled-up climate action.

**Four new ACBP components address some challenges and opportunities to further accelerate climate action.** These include a focus on (i) strategic engagement through NDCs to mainstream and institutionalize climate into national processes; (ii) **health and education** to deliver human capital that is healthy and well-skilled to address and counter climate impacts; (iii) **green financial systems** to mainstream climate risks into policies and regulations, standards, and frameworks (these will govern the financial sector and improve financial protection against climate-related risks to promote green competitiveness); and (iv) **harnessing satellite technology for climate resilience** (example of disruptive technology to help countries leapfrog into resilience through innovative applications in specific investments and through dedicated capacity building).

**The ACBP will consolidate and intensify action and engagement on climate adaptation and resilience in Sub-Saharan Africa through these emerging strategic directions:**

**Strategic and systemic country engagement for NDCs.** Expedite institutionalization of climate action for transformation at scale—across sectors and geographies—by working with countries, regional organizations, and international experts.

**Scaled-up and transformational investments in key sectors and areas.** Sustain an upscaled focus on CSA and landscapes, and power resilience through renewables, climate-smart cities, and transport systems through existing well-conceived and agreed investment plans. Invest in human and social capital focused on health, education, and social resilience to short-circuit the intergenerational downward spiral from climate impacts. Mobilize the private sector to boost value chains and access to (energy) markets while harnessing momentum for the Maximizing Finance for Development (MFD) approach.

**Harness innovation, technology, and knowledge to drive resilience.** Mobilize innovation and technology that supports environments conducive to green growth. Mobilize disruptive technology, such as satellite technology applications, to leapfrog countries toward climate resilience. Foster platforms for climate knowledge and exchange.

**Raise climate finance and mobilize the private sector.** Resource mobilization for climate action and close the gap on resource needs. Mobilize the private sector for renewable energies and innovations, such as blue and green bonds.

**The ACBP's Forward Look will be further refined and aligned with the World Bank Group's 2025 Targets to Step Up Climate Action<sup>2</sup>, which are structured around five themes:**

- Systematically increasing direct financing
- Significantly increase leverage of private finance
- Boosting support for adaptation
- Increasing systemic impact in countries
- Elevating climate actions in key sectors

## Conclusion

The ACBP Third Implementation Progress Report, reflecting 176 projects and US\$17 billion of bank financing, demonstrates resource mobilization well ahead of 2020 targets. Yet climate change is a dangerously moving target, and as impacts accelerate, so must countries' core resilience capacities. The ACBP supports national and regional climate action across every sector from CSA in Niger to rural inclusion in Kenya's growth. Mozambique's newly protected areas complement improved value chains, and West Africa's coastal area adaptation could create new livelihoods for marginalized coastal communities. Access to renewable forms of energy enhance resilience of populations in multiple ways. Even as some ACBP goals have been met, the stakes are changing, and the ACBP is evolving to stay ahead of these risks (see summary in table ES.2).

Sub-Saharan Africa is disproportionately impacted by climate change despite historically low contributions to global warming. The limited availability of climate finance, procedural complexities, increased demand for information, and severe capacity constraints require urgent attention if this region is to receive the requisite financing. Private sector financing must be a key part of the solution.

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2 <http://pubdocs.worldbank.org/en/368601543772742074/2025-Targets-to-Step-Up-Climate-Action.pdf>

Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18

ACBP	Progress FY16–FY18	Forward Look
<b>STRENGTHENING RESILIENCE</b>		
<b>Natural Capital</b>		
Climate-Smart Agriculture (CSA)	<p>The World Bank's Board approved 57 projects supporting CSA with cumulative commitments of US\$1.8 billion. These projects aim to improve the livelihoods of 6.6 million farmers and increase the climate resilience and productivity of more than 2.9 million hectares of land.</p> <p>CSA Investment Plans (CSIPs) were prepared for five countries, 10 CSA country profiles were completed; continued leadership on knowledge and advocacy through multiple fora.</p>	<p>Need for more transformational responses to support deep, systemic, scale up in CSA technologies and practices; leverage the big data and geospatial capabilities of the Agricultural Intelligence Observatory (Ag Observatory) in targeting climate-smart interventions; promote efforts to mainstream resilience into agriculture sector policies, incentives and investment; promote market system approaches and mobilize private sector resources for agricultural development; and assist client countries in improving food security risk management</p>
Climate-Resilient Landscapes (Drylands)	<p>Good overall progress. Ethiopia Sustainable Landscape Management Program targeting 807,300 hectares, and 8.8 million incremental carbon dioxides equivalent accumulated; more than 400,000 households involved. In Sudan, 100,000 hectares of land are managed by sustainable landscape management practices; and more than 15,000 hectares benefit from enhanced biodiversity protection. Intervention on institutional, policy, and information took place in: Ethiopia, Mozambique, Burundi, Ghana, Côte d'Ivoire, Madagascar, Kenya, Somalia, South Sudan, Sudan, DRC, and Uganda.</p>	<p>More financing is needed to support rural communities, test innovative mechanisms to crowd in private investment; targeted Technical Assistance, policies and technology uptake; and enhancing geographical reach. Diversification and increase of vegetation cover to be implemented on 100 million hectares preventing degradation (by 2030).</p>
Climate-Resilient Landscapes (Forests)	<p>Covers multiple country programs, harnessing a range of instruments and financing to advance the agenda: The Africa Forest Landscapes Program has 17 active country programs benefitting communities; funding includes BioCarbon, Forest Carbon Partnership Facility (FCPF), the REDD+ Readiness Fund, the Carbon Fund, and the Forest Investment Program (FIP). About US\$101 million was committed from the FCPF to 15 countries. Over US\$30 million has been allocated from the Central African Forest Initiative (CAFI) to four countries; 10 countries are preparing large-scale programs for performance-based payments for REDD+ and enhanced carbon stocks. 11 countries are supported by the FIP.</p>	<p>Leverage financing to deepen engagement and sustain momentum: additional FCPF endorsements for REDD+; implementation of large-scale REDD+ performance-based programs; signing of the first Emission Reductions Payment Agreement (ERPA) need investment resources to be able to implement their FIP plans; more proactive engagement from the private sector, particularly around commodities' supply chains (e.g. cocoa), is needed. The World Bank's Forest Action Plan provides a guiding framework, and the Mid-Term review currently underway is evaluating the Bank's overall progress (16-18) in sustainable forestry, forest-smart interventions (in non-forest sectors), climate resilience, rights and participation, and institutions and governance, including gender and biodiversity aspects.</p>
Integrated Watershed Management	<p>Beyond the focus on strategic river basins one needs to consider strategic planning to systematically frame climate-resilience-focused lending. Analytical work and decision support tools: Use of a variety of lending instruments for resilience programming: Niger CRIP – see below; Multi-phased Programmatic Approach; Development Policy Operations.</p>	

Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18 (continued)

ACBP	Progress FY16–FY18	Forward Look
<b>STRENGTHENING RESILIENCE</b>		
Niger River Basin	<p>The Bank and nine country counterparts identified a priority set of 123 interventions based on the Climate Resilience Investment Plan (CRIP) for the Niger at an estimated cost of US\$1.9 billion; finalizing preparation for two lending operations; supervising the implementation of the Sahel Irrigation Initiative project.</p>	<p>The Bank will finalize the preparation of Project 1 of the Building Climate Resilience in the Niger Basin Program and continue the preparation of the following projects of the Series of Projects (SOP). The AfDB PIDACC project's preparation will be finalized; increase use of remote sensing to improve monitoring of the basin.</p>
Lake Victoria Basin	<p>LVEMP2 was completed with multiple outcomes: protects ecological infrastructure; 28,118 hectares of soil erosion-affected land under sustainable land management practices and 3,523 of degraded wetlands restored or rehabilitated through over 630 community-driven development (CDD) activities; over 12,000 farmers have adopted soil and water conservation measures under climate-smart agriculture practices; new public sanitation facilities (serving around 150,000 people); major improvements in wastewater management in seven towns; water navigation improved; a technical assistance on resource efficiency and cleaner production (RECP) resulted in US\$26 million of private sector investment; the first phase of the Lake Victoria Transport Program (LVTP) in Rwanda was approved in 2017; assessment of climate risks completed for the Mwanza region of Tanzania.</p>	<p>The LVEMP3 is under preparation, with US\$225 million IDA committed by five LVB countries. LVTP and the LVEMP are coordinating with and complementing each other to manage climate and environmental risks to and from transport development and to support resilient rural livelihood development through both sustainable natural resources management and improved market access.</p>
Zambezi Basin	<p>Strategic Planning for a Common Investment Framework is at advanced stage; combined investments in the 8 riparian countries amount to more than US\$2 billion. The Diagnostic Phase and Strategic Direction Reports are complete. Basin development scenarios are currently under preparation, to be followed by benefit sharing assessments.; Data sharing and decision support system now operational; Legislation &amp; Policy Equivalence Analysis -harmonized options been proposed: options and recommendations will be considered in future support initiatives; Batoka Hydropower Development Investment: all studies are at an advanced stage and are being supplemented by additional analyses, taking into account climate variability and macro-economic viability.</p>	<p>The Zambezi Basin is one of 4 priority river basins in Africa under the CIWA MDTF transboundary water program - an entry point to catalyze future financing opportunities in the basin; engaging innovative technologies such as LiDAR and modelling that will help identify further areas for support.</p>
Climate-smart ocean economy	<p>The Bank made 17.1 million in direct investments in the climate-smart ocean economy. Steady progress has been made against the target of US\$220 million (by 2020), increasing from 9 percent in FY 16 to 42 percent in 2017, and 71 percent in FY 18; through direct investments and Program for Results operations in support of pilot fisheries and climate-resilient livelihood projects; mobilized US\$500 million from Nordic Development Fund (NDF); SWIOFish1 (P132123), SWIOFish2 (P153370) and SWIOFish3 (P155642) operations continue to strengthen fisheries governance in Comoros, Mozambique, Tanzania, Madagascar, and Seychelles; First Blue Bond issued by the Government of Seychelles to support the transition to a Blue Economy; new ASA to improve fisheries governance and increase economic benefits and inputs to investment operations in COREP; Fisheries Transparency Initiative (FiTI) to help institutionalize transparency in the fisheries sector.</p>	<p>Maritime Spatial Planning (MSP) is an area where client demand is growing quickly, and where the World Bank could play an important role by increasing TA and assisting in the identification of opportunities and carrying out investments.</p>

Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18 (continued)

ACBP	Progress FY16–FY18	Forward Look
<b>STRENGTHENING RESILIENCE</b>		
<b>Physical Capital</b>		
Climate-smart cities	<p>Efforts have moved beyond technical assistance toward dedicated financing in three areas: (a) capacity building; (b) resilient infrastructure, buildings, and services; and (c) partnerships and city networking for knowledge sharing. The target of developing resilience plans in 20 African cities by 2022 has been well surpassed, with local resilience planning and capacity building activities completed or underway in more than 100 cities. The Bank has committed a total of US\$2.27 billion to support investment operations for climate- and disaster-resilient development in urban areas across twelve countries. Seven of the investments directly target medium (Saint Louis, Freetown) and large (Accra, Antananarivo, Dakar, Dar Es Salaam, Ibadan) cities, while the remaining target several cities across their respective countries. In terms of partnerships and city networking for knowledge sharing, the Bank is a part of the Medellin Collaboration on urban resilience and has been working closely with international partners. Stronger capacity for integrated risk management is expected to benefit more than 100 cities and about 70 million people.</p>	<p>Climate-Smart Cities is a crucial and large, multi-sectoral business line: Policy changes to improve the form and functions of African cities, shift to climate-resilient buildings, infrastructure, services, efficient land-use and planning and building regulations, and enforcement capacity is key. There is a critical need to invest in upstream analysis through such transitions.</p>
Coastal resilience (West Africa)	<p>The US\$225 million (including US\$190 million of IDA and US\$20.25 million of GEF) WACA Resilience Investment Project (ResIP) was approved by the WB Board for six countries and four regional institutions. The program will address coastal erosion, flooding, improved watershed management, and support pollution control.</p> <p>A WACA Platform was launched to scale up the WACA program to the order of US\$2 billion. The Platform will mobilize knowledge and expertise to customize technical solutions to development challenges, establish a market place for countries to mobilize the financing and public-private partnerships in support of their multi-sector investment plans, and significantly raise the game by engaging highest level of decision-makers. The Platform is Bank-executed supported by a EUR 5 million grant from the Nordic Development Fund, and US\$1 million from the GFDRR. Once the platform is operating the function for knowledge, finance and dialogue would be transferred to one or more regional organizations.</p> <p>In the interest in scaling up further, a dialogue was initiated with the Interregional Coordination Center (ICC) in Yaoundé, Cameroon which supports implementation of the regional strategy on safety and security within the Central and West African common maritime space.</p>	<p>Recognizing the needs for financing—on the order of US\$2 billion, and building on a successful WACA Program Launch, where thirteen governments adopted the WACA Communiqué —the WACA Platform will seek to attract existing and develop new financing instruments; an engagement of the ICC with other regions of Africa needs to be scaled up that are experiencing similar pressure in the coastal zone.</p>
Climate-Smart Transport	<p>Since 2016, a progressively larger share of newly approved transport projects embedding climate considerations to: (i) improve the resilience of African transport infrastructure to climate change; and (ii) improve the carbon-efficiency of transport systems in Sub-Saharan Africa. Commitment of US\$ 1.9 billion, of which 90 percent IDA funds, for fifteen climate informed projects over that three-year period. The latest addition to the Bank portfolio consists of four climate informed transport projects and represents the entirety of the Fiscal Year 2018 transport approvals for Africa, with a combined IDA financing commitment of US\$ 553 million.</p>	<p>To move from a reactive to a proactive business model on climate-resilient and low-carbon transport in Africa, the Bank will continue to emphasize transformative core technical work on resilience (logistics and freight; urban mobility systems, data and information for infrastructure design, a priori planning for disaster response, capacity building) and decarbonization of transport systems (urban transit lines, efficiency of trucking fleet, strengthen enabling environment).</p>

Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18 (continued)

ACBP	Progress FY16–FY18	Forward Look
<b>STRENGTHENING RESILIENCE</b>		
<b>Human and Social Capital</b>		
Social Protection	<p>A total of 33 projects at over US\$2 billion, were financed by IDA and trust fund resources; this greatly exceeded the targets set out in the ACBP, reflecting a growing demand for these services. Increasingly, this includes adaptive elements, including scaled-up safety net programs, based on early warning information for the use of seasonal assessment and humanitarian appeals to the creation of new triggers based on data from satellites. The Bank is increasingly working together with humanitarian partners to harmonize approaches and build systems. Public works programs funded in Ethiopia, Niger, Madagascar, and Tanzania are increasingly focusing on investments in landscape management (e.g. soil conservation, watershed management, reforestation, rehabilitation of eroded lands) that have direct effects on climate mitigation.</p>	<p>The role of safety net programs in responding to shocks is increasingly important. Funds from the Crisis Response Window were channeled through national safety net. Technical assistance to help governments identify and secure financing to scale up safety nets is essential, as well as work is on macro-insurance (to be offered through the Africa Risk Capacity, contingency budgets, and instruments, including Development Policy Loans with CAT-DDOs and more traditional humanitarian financing) and the design, testing and piloting of productive interventions that promote livelihood diversification are emerging as important areas.</p>
Addressing Drivers and Impacts of Migration	<p>Several large operations, with financing of more than a US\$300 million, were approved for Kenya, Uganda, the Great Lakes, and Regional (Development Response to Displacement Impacts Project - DRDIP in Ethiopia, Uganda, Djibouti) projects to address the impacts of forced displacement and migration; Additional Financing of US\$8.18 million for Kenya DRDIP; US\$150 million for Uganda; and smaller targeted projects, including a US\$3 million Grant to IGAD to set up the Regional Secretariat on Forced Displacement and Mixed Migration and target inclusive community resilience and gender-based violence (Somalia). Adaptation measures were also implemented in Sao Tome and Principe.</p>	<p>Flows of forcibly displaced people continue to increase in the Horn of Africa, the Great Lakes Region, the Lake Chad region, the Sahel, and other countries on the continent; approach of providing longer-term development solutions and transitioning from emergency assistance is proving to have transformative impact. As Bank operations in this area continue to grow, it will be important to monitor impacts and share learning as it emerges. Need to get ahead of the curve to advance mobility as an adaptation strategy, drawing on good practice.</p>
<b>POWERING RESILIENCE</b>		
Solar power	<p>On track to achieve short-term target of supporting 1GW of grid-connected solar by 2023. Approved lending for six grid-connected solar projects in 5 countries and ECOWAS in the amount of US\$80 million. The total solar generation capacity through these operations sums up to 650MW. The progress towards off-grid target to support 5 million consumers by 2023 is relatively slow due to the nascence of the sub-sector in many SSA countries: ten projects were approved for US\$500 million, and this is expected to provide off-grid electricity services to an estimated 1.4 million households. As the sub-sector matures, there is likely to be an increased investment in this space. World Bank/ESMAP has launched a <b>Global Solar Atlas</b> to guide solar development in Africa and elsewhere. The Bank has also been leading <b>Lighting Africa</b> and the <b>Lighting Global programs</b>, which support the scale-up of solar home systems (case study below).</p>	<p>Due to the falling cost of solar PV and successful cases of solar auctions in SSA, there is increasing demand for the Bank to support grid-connected PV electricity expansion as a solution to reduce dependency on fossil-fuel thermal electricity generation. There are at least six grid-connected solar projects currently in the pipeline and a clear expansion of battery storage tied to PV electricity generation. There is also a strong momentum for scaling up off-grid electrification technologies, including solar home systems and mini-grids. The Bank is also preparing a regional project in West Africa to support private solar off-grid solutions in the region.</p>
Hydropower	<p>In this period, the Bank approved ten projects, which included support for hydropower development at the total scale of 460MW. The largest project was the Nachtigal hydropower project in Cameroon with a capacity of 420MW. The remaining 60MW are from small hydro projects at various stages of development. With pipeline projects in Malawi and Sierra Leone totaling 448MW, the Bank should be on track to meet the target of supporting 1GW by 2026.</p>	<p>Considering increasing development of Variable Renewable Energy (VRE), complementary services provided by hydropower should be further analyzed and enhanced in upcoming projects; Ancillary services and flexibility brought by hydropower are crucial for the stability of energy systems – further support to the development of market and remuneration for ancillary services.</p>



Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18 (continued)

ACBP	Progress FY16–FY18	Forward Look
<b>POWERING RESILIENCE</b>		
Geothermal	<p>In 2016, the Bank approved US\$53.2 million to further support geothermal plants in Kenya (Olkaria I and IV, which totaled 280MW). This constitutes important progress towards the target of supporting 500 MW by 2026. In Ethiopia, geothermal drilling at the Aluto Langanos site has been delayed but is now progressing. The Bank is also supporting Ethiopia to develop its internal capacity for geothermal development through south-south knowledge sharing. Technical assistance work for geothermal development, such as surface exploration, is ongoing in Tanzania, Malawi, and Uganda.</p>	<p>Other countries in East Africa are in the reconnaissance and early exploration phase; Bank's support has focused on sharing the risk of such upstream exploration.</p>
<b>ENABLING RESILIENCE</b>		
Africa Hydromet Program	<p>Phase I of the Africa Hydromet program will benefit more than 100 million people in 15 Sub-Saharan African countries and 4 regional organizations, by building the technical, human, and financial capacity to provide forecasts, warnings, and value added climate information services and products.</p> <p>FY16-18: By the end of FY18, the Bank's active commitments in the Africa Hydromet program stood at US\$230.1 million, a US\$33.5 million increase over the previous year with support from IDA, GCF, and CREWS. Investment and technical assistance operations were being implemented in 19 countries. GFDRR grants to support coordination of the Africa Hydromet program partnership convened by the Bank have remained instrumental in organizing "deep-dive" meetings of program partners (World Bank, World Meteorological Organization, African Development Bank, United Nations Development Programme, French Development Agency, and World Food Programme).</p>	<p>Expanding the Program to cover contiguous countries and their regional climate centers in a programmatic modernization plan remains the focus of efforts. Inadequate IDA support and overdependence on lateral funding from Green Climate Fund, CREWS and Global Environment Facility funds are stalling the deployment of optimum resources to meet the demand from countries. The pipeline includes ten countries in Sub-Saharan Africa, but needs to be confirmed for IDA financing, which is a pre-requisite for co-financing from other sources including the Green Climate Fund.</p>
AFRI-RES Facility	<p>FY16-18: AFRI-RES (Africa Climate Resilient) Facility is a partnership between the World Bank and UNECA (leveraging the AUC) through a EUR5 million NDF grant, to support Africa's capacity to systematically integrate climate change considerations into the planning and design of long-lived investments. Technical Assistance, of US\$1 million provided to 14 projects under preparation covers 7 sectors: Agriculture, Energy, Environment, Urban, Transport, Water, and Social Protection - provided resources to integrate climate resilience interventions into project design, and generate broad learning, knowledge exchange, and dissemination through the program. Three region-wide Africa Climate Resilient Infrastructure Summits have been held. The most recent (ACRIS III) which took place in Morocco in February 2018 attracted 250 participants and 10 high-level panels focused on resilience in the context of infrastructure, energy, agriculture, climate information, landscapes, technology, and other key areas, and provided for direct interactions between the public and private sector stakeholders to discuss climate-resilient opportunities in Africa.</p>	<p>Resource mobilization continues to be an important focus; development and dissemination of concrete knowledge products within the Bank and in partnership with UNECA; opportunities to harness greater synergies with PIDA (Program for Infrastructure Development) and development in cooperation with AUC.</p>

Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18 (continued)

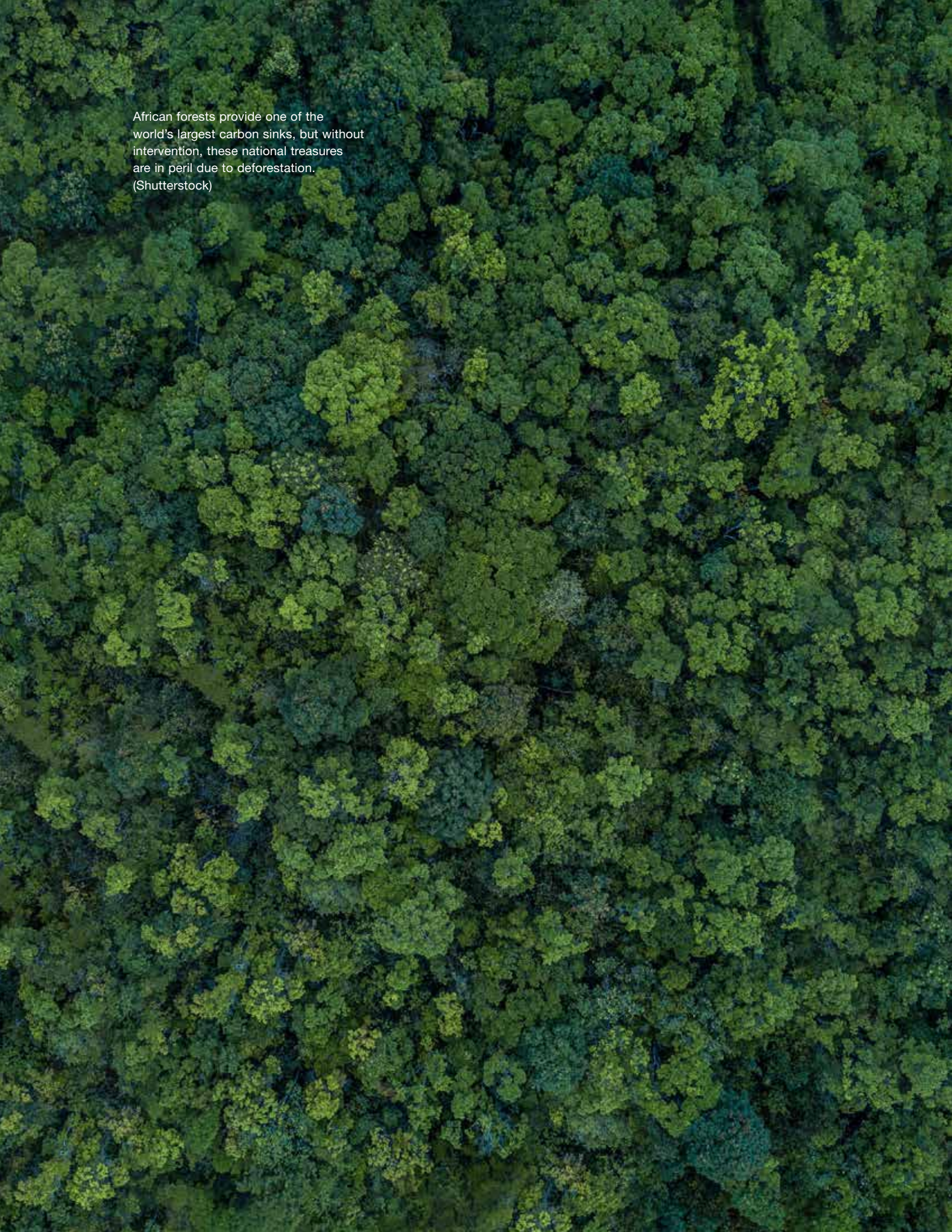
ACBP	Progress FY16–FY18	Forward Look
<b>NEW ACBP COMPONENTS</b>		
<p>Strategic Support for NDCs</p> <p>(Enabling Resilience)</p>	<p>FY16-18: All SCDs and CPFs completed in FY18 incorporate climate risks and vulnerabilities. To ensure continued strategic and systematic engagement for climate action, and enhance visibility and ownership, this new ACBP component will seek to:</p> <ul style="list-style-type: none"> <li>• Integrate climate risks and NDCs in all SCDs and upstream analytics;</li> <li>• Deepen integration of NDC priorities and climate action into all CPFs;</li> <li>• Link project pipelines corresponding to needs and priorities in the CPF with NDC implementation; and</li> <li>• Engage in country NDC dialogue and mainstreaming of climate action based on country demand.</li> </ul>	
<p>Green Financial Systems, Financial Protection Instruments, and Green Competitiveness</p> <p>(Enabling Resilience)</p>	<p>To support the (business) climate in the financial system through a set of priority activities that will seek to mainstream climate risks into policies and regulations, standards and frameworks governing the financial sector; improve financial protection against climate-related risks and promote firm green competitiveness. Areas of focus:</p> <ul style="list-style-type: none"> <li>• Build a better understanding of the links between climate and related environmental factors with local financial sectors in Africa through research, data collection, and dissemination workshops and conduct 5 climate risk assessments in financial sector by 2030;</li> <li>• Develop country programs and projects that promote and integrate green elements into banking, capital markets, and pension funds - develop 4-country programs by 2030;</li> <li>• Cover more countries with new or improved financial protection instruments, including insurance, risk pools, and contingent finance, e.g. African Disaster Risk Financing (including Cat-DDO), Global Index Insurance Facility - expanded protection coverage in 10 more countries with these instruments and tools; and</li> <li>• Increase green competitiveness and innovation through climate-related investments while protecting industries against climate impacts. By 2030, the objective is to develop 20 country programs that integrate green competitiveness into their growth strategies.</li> </ul>	
<p>Climate-Smart Health</p> <p>(Strengthening Resilience: Human &amp; Social Capital)</p>	<p>This is a new component with overarching outcomes to support: (i) adaptation to climate change through planning for and adapting to climate and disaster impacts and reducing the burden and impact of climate-sensitive diseases; and (ii) investing in low-carbon Investments in low-carbon healthcare, which is planned, built and delivered with minimal emission of greenhouse gases through:</p> <ul style="list-style-type: none"> <li>• Strengthening regional, national, and local institutional capacity for climate change adaptation and enhance climate change mitigation;</li> <li>• Strengthening the public health and environmental response to climate-sensitive diseases; and</li> <li>• Scaling-up investments to address climate change in the health sector and “Health in All Policies” approach in non-health sector.</li> </ul> <p>The proposed activities will benefit all IDA/IBRD countries with active operations, with a focus on the 21 countries with high health and habitat vulnerabilities in the short term (high priority countries), the 19 moderate countries with high health or habitat vulnerabilities in the medium term, and the remaining low-priority countries in the long-term. The HNP Africa Climate and Health strategy (2018-2030) builds on the analytical and operation experience (REDISSE, Rwanda cookstove) gained over the years to support SSA countries reduce the impact of climate change on all aspects of health, strengthen the climate resilience of their health systems, and contribute towards climate change mitigation.</p>	

Table ES.2: ACBP Components' Implementation Progress and New Components, FY16-FY18 (continued)

ACBP	Progress FY16–FY18	Forward Look
<b>NEW ACBP COMPONENTS</b>		
Climate-Smart Education	<p>This is a new ACBP component. The key outcomes sought include the following: Reduce climate change impact and support knowledge generation and capacity building in climate change by: (i) financing climate-smart infrastructure; (ii) integrating information on climate change issues and responses in basic education curriculum development and teacher training; and (ii) supporting skills acquisition in technical and vocational education and training and research at the tertiary level in relevant fields.</p>	
(Strengthening Resilience: Human & Social Capital)	<p>FY18: the Africa Education Portfolio saw a five-fold increase in its commitments with direct climate co-benefits (from US\$1 million in FY17 to US\$5 million in FY18). Six projects were approved, supporting climate-smart education in the region. In the technical and vocational sub-sector, the Bank has supported the shift from traditional skills acquisition to more modern training that focuses on renewable energy, energy efficiency, and environmental preservation, and these skills are not only beneficial for building resilience but are deemed to be the drivers for economic growth in the target countries as they replace outdated markets.</p>	
Harnessing Satellite Technology for Innovation and Climate Resilience	<p>Mobilizing disruptive technology to leap-frog into innovation is key for Africa as it counters climate challenges. The use of satellite data and other forms of technology (drone mapping) in building resilience to climate change and climate variability is of keen interest due to the scarcity of quality data to assess the climate risks and potential impacts. The objective is to enable a more systematic uptake and application of earth satellite technology at the project and client level to harness benefits of monitoring, access to systematic data sets, climate monitoring and forecasting, and other applications, integrated with (scarce) existing data sources. Specific action areas: (i) TA support to increase access to geospatial information and data, to support decision makers in challenges; (ii) Partnership with key agencies (e.g. IFIs, national hydrological and meteorological agencies and innovators (e.g. citizens, entrepreneurs) to derive high-level data products supporting the monitoring and management of climate change risk in countries; and (iii) Capacity building to raise awareness about climate resilience goals and learn about user requirements through training sessions.</p>	



African forests provide one of the world's largest carbon sinks, but without intervention, these national treasures are in peril due to deforestation. (Shutterstock)





# Part I

# Portfolio-Level Progress

## 1. Introduction

**Development and climate change in Sub-Saharan Africa are inextricably linked, arguably more so than in any other part of the world.** Climate action cannot be divorced from the development agenda. This has been the driving force of the Africa Climate Business Plan (ACBP),<sup>3</sup> the Bank's platform for climate engagement in Africa. It was launched in December 2015 to accelerate resource mobilization for priority climate-resilient and low-carbon initiatives in the region.

Sub-Saharan Africa's race to resilience is even more urgent with the release of the IPCC 1.5°C Special Report. The region must adapt to the 0.5°C warming of the past 50 years, while planning for the intensification of impacts. The good news is that the region is not starting from zero; the bad news is that the current pace of climate action is far from sufficient. Since 2016, the ACBP has been a galvanizing platform for climate action. It must now step up its level of ambition, and the scale and pace of climate action, to manage climate risks. It needs to deliver on climate-resilient development, building on the lessons and innovations from its strong portfolio. The ACBP Third Implementation Progress and Forward Look has three parts:

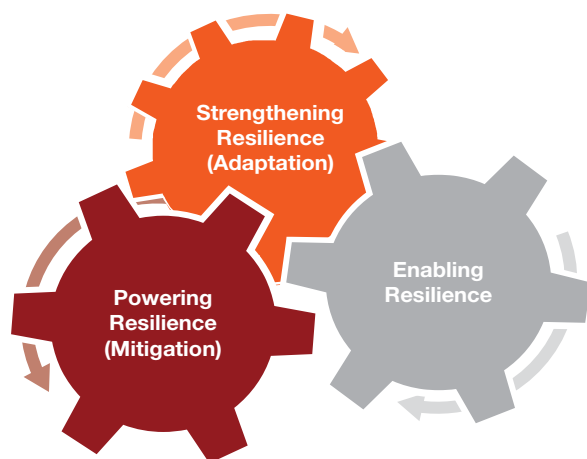
- **Part I: Portfolio Level Progress.** This section discusses key indicators of financing, corporate climate commitments on co-benefits, and mainstreaming.
- **Part II: Progress on ACBP Components and Introduction to New Components.** For more concerted climate action, this section focuses on Health; Education; Finance, Competitiveness, and Innovation (FCI); and Harnessing Satellite Technology for Innovation and Climate Resilience.
- **Part III: Forward Look.** This section explores the strategic and systemic shifts to deepen engagement and support transformational and scaled-up action in Sub-Saharan Africa to develop climate-resilient economies, building on lessons and innovations from the ACBP portfolio.

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<sup>3</sup> See the World Bank web page "Africa Climate Business Plan," available at <http://www.worldbank.org/en/programs/africa-climate-business-plan>.

The ACBP, conceived through an inclusive process, identified more than a dozen priority areas (business lines) for climate action and assigned them to three mutually reinforcing resilience clusters: strengthening resilience, powering resilience, and enabling resilience (figure 1.1).

Figure 1.1: Clusters of Resilience in Africa Climate Business Plan



**Cluster 1—Strengthening Resilience** includes select initiatives aimed at boosting the resilience of the region’s assets.

**Natural capital** includes Climate-Smart Agriculture (CSA); Climate-Resilient Landscapes (Forests and Drylands); Integrated Watershed Management (Chad, Niger, Lake Victoria, and Zambezi, and water resources more broadly); and Climate-Smart Ocean Economies.

**Physical capital** includes Climate-Smart Cities; Coastal Resilience (West Africa and now more broadly); and Climate-Smart Transport.

**Human and social capital** encompasses social resilience more broadly (Social Protection), and is addressing drivers and impacts of migration. In this category are two new features: Climate-Smart Health and Climate-Smart Education.

**Cluster 2—Powering Resilience** includes opportunities for scaling up low-carbon energy and contributing to increased access to energy (a key ingredient for resilience). Solar, Hydropower, and Geothermal components explore technologies to mitigate climate change.

**Cluster 3—Enabling Resilience** provides data, information, and decision-making tools for promoting climate-resilient development across sectors. One focus is strengthening the region’s hydrometeorological systems (e.g., the Africa Hydromet Program component).

Africa Climate Resilience Investment Facility (AFRI-RES) allows for capacity enhancement and knowledge generation. New components include Green Financial Systems, Financial Protection Instruments, and Green Competitiveness and Innovation;



## Progress on Mobilizing Resources for ACBP Investments

### Portfolio for Resource Mobilization

**Significant progress has been made in FY18 toward implementing the ACBP** (table 1.1). In the first semester, the World Bank’s Board approved 23 new investment operations contributing to ACBP components, with total commitment of US\$2.36 billion. The second semester saw a stronger delivery: doubling commitments with 45 projects and US\$5.85 billion. A total of 68 projects with Bank commitment of US\$8.21 billion were approved in FY18. Average project size is US\$128 million, a percentage increase of 67 percent, suggesting a larger project size compared to previous years.

**The total cumulative Bank funding to the ACBP since its inception now stands at about US\$17 billion, exceeding the ACBP resource mobilization target set for 2020 for the Bank commitment ahead of time.** The initial Bank target was set at US\$5.683 billion, but was increased to US\$8.483 billion with the inclusion of the transport component in April 2016. The status of Bank funding against the initial targets increased from 36 percent to 106 percent from FY16 to FY17 and doubled to more than 200 percent in FY18. International Development Association (IDA) 17 and IDA18 (which started July 1, 2017) have enabled a strong delivery of the ACBP against the 2020 targets (table 1.1).

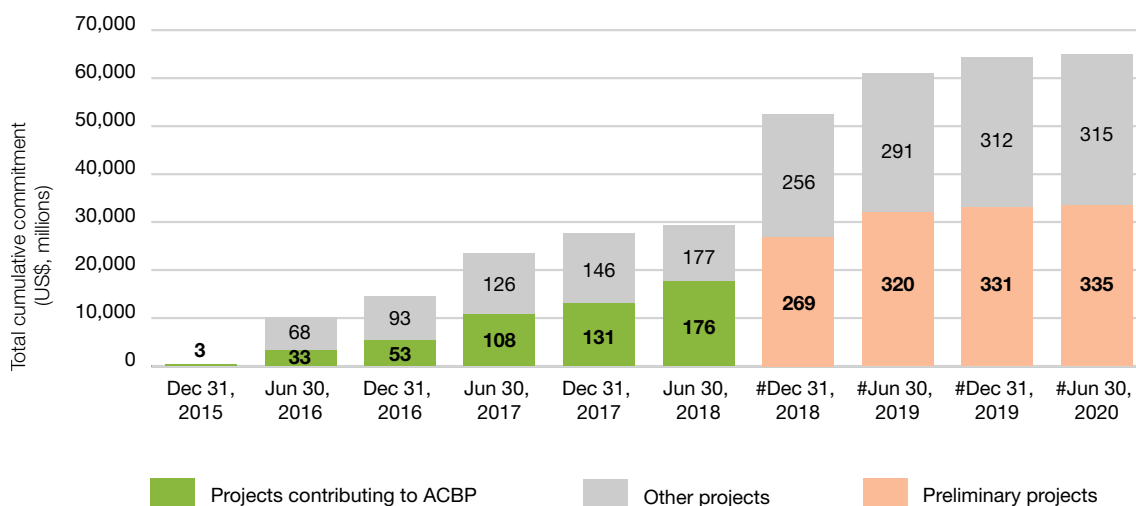
**Table 1.1:** World Bank Projects’ Contributions to ACBP Implementation

FY	Semester end	Cumulative number of projects	Cumulative commitments (US\$, millions)	Resource mobilization against target (US\$8.483 billion) (%)	Status against target (%)
<b>Board-approved projects</b>					
FY16	December 31, 2015	3	430.0		
	June 30, 2016	33	3,074.6		36
FY17	December 31, 2016	53	4,360.7		
	June 30, 2017	108	8,779	25	103
FY18	December 31, 2017	131	11,148		
	June 30, 2018	176	16,997		200
<b>Preliminary projections based on pipeline</b>					
FY19	December 31, 2018	269	25,964	50	
	June 30, 2019	320	32,277		
FY20	December 2019	331	33,994		
	June 30, 2020	335	34,714	75	

*Note:* Figures for projects approved by the WBG Board of Directors up to June 30, 2108 (FY18) are final. Figures for the pipeline are estimates and subject to change. The volume of WBG financing for ACBP projects includes IDA and IBRD (no trust funds).

**Figure 1.2 shows a steady increase in the number of ACBP projects, reaching 176 by the end of FY18 and with a reasonably strong pipeline for FY19.** It will be important to keep up the momentum in FY20. At the end of FY18, the ACBP portfolio was about 50 percent of the total portfolio in the region and set to increase in the coming years.

**Figure 1.2:** Number of Projects and Volume of World Bank Commitments ACBP and Other (Non-ACBP) in Africa



Source: World Bank.

Note: Figures related to projects approved by the World Bank board of directors up to June 30, 2018, are final. Figures related to later approval dates are provisional estimates and subject to change. Data show the number of projects contributing to ACBP implementation (approved and preliminary estimates) and other or non-ACBP projects (approved and preliminary estimates).

### Resource Mobilization by ACBP Clusters and Components

**The ACBP has exceeded the total World Bank resource mobilization target set out to be achieved by 2020** (table 1.2). Between FY16 and FY18, US\$16.43 billion has been mobilized for the original ACBP components through IDA, the International Bank for Reconstruction and Development (IBRD), and Bank-administered trust funds, reflecting almost double the target of US\$8.5 billion (with transport) set for 2020. The new ACBP components (Health, Education, and FCI for FY18) increase the commitment to US\$19.26 billion. The preliminary pipeline for FY19 to FY20 is promising, with an indicative delivery of almost US\$12.9 billion from IDA and a further US\$1.4 billion from IBRD.

Table 1.2: Contribution to Climate Co-Benefits by ACBP Cluster and Component, FY16–FY18

ACBP component	Fundraising targets (fast track)			FY16–18 (approved projects)			FY19–20 (preliminary pipeline)			Status against 2020 fundraising targets			
	Total	IDA	Co-financing	Total	IBRD	IDA	Total	IBRD	IDA		Co-financing		
Strengthening resilience	10,363	4,240	6,123	213	15,886	602	14,330	201	177	10,341	296	9,741	142
Natural capital				116	6,861	410	5,734	71	103	5,028	293	4,457	38
Climate-Smart Agriculture (CSA)	3,000	1,300	1,700	60	4,109	400	3,446	44	40	3,041	263	2,598	29
Climate-Resilient Landscapes	1,605	355	1,250										
Drylands				17	418	–	279	11	20	398	15	372	5
Forests				15	432	–	199	–	16	222	15	156	5
Watera				9	1,477	–	1,477	2	11	662	–	648	–
Integrated Watershed Management (Niger, Chad, Zambezi, Lake Victoria)	2,967	890	2,077	3	206	–	206	2	8	420	–	402	–
Climate-Smart Ocean Economies	220	30	190	12	220	10	127	12	8	284	–	282	–
Physical capital				43	5,251	192	4,884	42	38	4,048	3	4,022	8
Climate-Smart Cities	1,025	550	425	15	2,039	–	2,007	–	10	531	3	507	8
Coastal Resilience (West Africa)	450	150	300	3	72	–	65	–	4	42	–	40	–

IDA and total targets exceeded; IBRD leveraged. Co-financing low. Good pipeline.

IDA target exceeded. Co-financing low. Good pipeline.

IDA target exceeded; total on track (with pipeline). Co-financing low.

IDA target exceeded threefold. Co-financing low. Strong pipeline.

IDA and total targets exceeded; co-financing absent/not reflected.

Part of the WACA funding is reflected under other ACBP components.

Table 1.2: Contribution to Climate Co-Benefits by ACBP Cluster and Component, FY16–FY18 (continued)

ACBP component	Fundraising targets (fast track)				FY16–18 (approved projects)				FY19–20 (preliminary pipeline)				Status against 2020 fundraising targets
	Total	IDA	Co-financing	No. of Projects	Total	IBRD	IDA	Co-financing	Total	IBRD	IDA	Co-financing	
Climate-Smart Transport	3,177	2,800	377	25	3,139	192	2,811	42	24	3,475	—	3,475	IDA target met, total target almost met. Co-financing low. Strong pipeline.
Human and social capital				54	3,774	—	3,712	88	36	1,265	—	1,262	96
Social Protection	480	365	115	23	2,383	—	2,327	22	13	797	—	797	IDA and total targets exceeded four- to sixfold, respectively. Co-financing low.
Addressing Drivers and Impacts of Migration	616	600	16	5	45	—	39	—	6	132	—	131	Low delivery, in part could be due to overlap with social protection.
Education				15	1,010	—	1,010	46	9	220	—	219	New ACBP component. The approvals are for FY18 only.
Health				11	336	—	336	20	8	115	—	114	New ACBP component. The approvals are for FY18 only.
Powering resilience	5,398	1,335	4,063	30	2,266	325	1,843	7	28	2,298	325	1,963	70
Solar Power	3,240	750	2,490	20	1,536	—	1,438	7	22	1,529	25	1,503	70
Hydropower	1,208	85	1,123	9	663	325	338	—	6	769	300	460	—
Geothermal	950	500	450	1	68	—	68	—	—	—	—	—	—
Enabling resilience	320	108	212	2	68	—	20	—	27	1,992	800	1,192	50

Table 1.2: Contribution to Climate Co-Benefits by ACBP Cluster and Component, FY16–FY18 (continued)

ACBP component	Fundraising targets (fast track)				FY16–18 (approved projects)				FY19–20 (preliminary pipeline)				Status against 2020 fundraising targets
	Total	IDA	Co-financing	No. of Projects	Total	IBRD	IDA	Co-financing	Total	IBRD	IDA	Co-financing	
Africa Hydromet Program	270	108	162	2	47	20	—	4	370	—	121	50	Progressing. Good pipeline.
Harnessing Satellite Technology for Innovation and Climate Resilience													New ACBP component. Initial focus is on satellite data.
Finance, Competitiveness, and Innovation								5	1,501	370		—	New ACBP component. The approvals are for FY18 only.
Macroeconomics, Trade, and Investment								18	121	800	701	—	New ACBP component. The approvals are for FY18 only.
Africa Climate Resilient Investment Facility	50			14	105							—	
Strategic Support for NDCs				8	3.11								New ACBP component. These are not part of the totals. Reflect direct client engagement financed by the NDC Support Facility, bilateral partners, and other trust funds.
<b>Total without Transport</b>	<b>16,081</b>	<b>5,683</b>	<b>10,398</b>	<b>199</b>	<b>13,287</b>	<b>735</b>	<b>98</b>	<b>168</b>	<b>8,950</b>	<b>621</b>	<b>8,017</b>	<b>252</b>	IDA target exceeded twofold. Co-financing is lagging significantly. Healthy overall pipeline.

Table 1.2: Contribution to Climate Co-Benefits by ACBP Cluster and Component, FY16–FY18 (continued)

ACBP component	Fundraising targets (fast track)			FY16–18 (approved projects)			FY19–20 (preliminary pipeline)			Status against 2020 fundraising targets				
	Total	IDA	Co-financing	Total	IBRD	IDA	Total	IBRD	IDA		Co-financing			
Total with Transport	19,258	8,483	10,775	214	16,426	927	13,370	140	192	12,425	621	11,492	252	IDA target exceeded, overall target on track. Co-financing lagging significantly.
Total with new GPs				259	19,249	927	16,193	208	232	14,631	1,421	12,896	262	

Note: Financing for a project that contributes to more than one ACBP component is split equally by the number of components it contributes to. These figures include funding for IDA, IBRD, and Bank-administered trust funds. Resource mobilization targets for Bank financing targets up to 2020 (US\$, millions): IDA: US\$5.863 billion (increased to US\$8.483 billion with transport); climate finance: US\$2,227 billion; other dev. finance: US\$1,979 billion; private sector: US\$3.515 billion; domestic resources: US\$703 million; resource gap: US\$1,974 billion; total US\$16.081 billion. Shading: green indicates expectations exceeded in either IDA or total resource mobilization; beige indicates progressing; white denotes new ACBP components, with partial reporting against FY18 for education and health.

a. **Water includes projects that fall outside the river basins.**



**Co-financing figures are lower than anticipated due to the difficulty of tracking resources not handled by the Bank.** Delivery through financial flows directly handled by the Bank (IDA, IBRD, and some trust funds (Global Environment Facility [GEF], Global Facility for Disaster Reduction and Recovery [GFDRR], carbon finance) have been tracked through the World Bank’s reporting system.

**The strengthening *resilience cluster* continues to see strong resource mobilization, exceeding the 2020 targeted amounts with IDA/IBRD resources.** Table 1.2 indicates that ACBP components (in green) on CSA, Integrated Watershed Management, Climate-Smart Cities, and Social Protection have all exceeded expectations in response to growing demand. Social Protection projects saw a fivefold increase in delivery.

**Powering resilience through the renewable options are on track to meet 2020 targets for Solar and Hydropower.** Pipelines are modest: they can deliver timely targets yet could benefit from scaled-up co-financing. Geothermal energy does not have an indicative pipeline.

**Enabling resilience, as a composite of projects and knowledge generation and capacity building, strengthens delivery.** Using AFRI-RES and other knowledge platforms for analytics and capacity building (Cooperation for International Waters in Africa [CIWA], TerrAfrica, Program on Forests [PROFOR], West Africa Coastal Areas Management Program [WACA]) multiplies these gains and effects change at scale (table 1.3).

**Table 1.3:** Knowledge Platforms that Strengthen Delivery of ACBP Components

Knowledge or technical assistance platform	Overall objective	Linkages to ACBP
AFRI-RES <sup>a</sup>	To strengthen the capacity of African institutions and private sector to plan, design, and implement investments in selected sectors, so as to increase their resilience to climate change. Project period: 2017–20.	Component under the enabling resilience cluster.
PROFOR <sup>b</sup>	To support in-depth analysis, innovative processes, knowledge sharing, and dialogue to forest conservation and management in LICs. It has five themes: cross-sectoral; poverty; finance; governance; and climate change.	Supports the strengthening resilience cluster, specifically the Climate-Resilient Landscapes (Forests) subcomponent.
TerrAfrica <sup>c</sup>	To promote scaling up of sustainable land/landscape management in Sub-Saharan Africa since 2005, focusing on knowledge management at the regional level, coalition building, and country investments.	Supports the strengthening resilience cluster, in particular Climate-Resilient Landscapes subcomponent.
CIWA <sup>d</sup>	To assist riparian governments in Sub-Saharan Africa in unlocking the potential for sustainable, climate-resilient growth by addressing constraints to cooperative water resources management and development.	Supports the Integrated Watershed Management cluster, including Lake Victoria, Niger River Basin, and Zambezi River Basin.

Table 1.3: Knowledge Platforms that Strengthen Delivery of ACBP Components (*continued*)

Knowledge or technical assistance platform	Overall objective	Linkages to ACBP
WACA <sup>e</sup>	To mobilize public, private, and civil society partners to support sustainable development and reduce climate risk for people living in West African coastal areas. The platform has three pillars: knowledge, financing, and dialogue; each provides a set of services designed to accelerate knowledge development and exchange, leverage the financing needed, and foster the political dialogues to ensure the engagement and buy-in of all stakeholders at the highest levels.	Supporting Coastal Resilience component and sustainable blue economy (Climate-Smart Ocean Economies).

Note:

- a. Core funding: NDF (€5.0 million). See the AFRI-RES website, <https://www.ndf.fi/project/africa-climate-resilient-investment-facility-afri-res-ndf-c91>.
- b. See the PROFOR website, <https://www.profor.info/>.
- c. The Leveraging Fund has received US\$22 million from the EC, the Netherlands, and Norway. See the TerrAfrica website, [www.terrafrica.org](http://www.terrafrica.org).
- d. See the World Bank's CIWA website, <http://www.worldbank.org/en/programs/cooperation-in-international-waters-in-africa>.
- e. See the WACA Program website, [www.wacaprogram.org](http://www.wacaprogram.org).

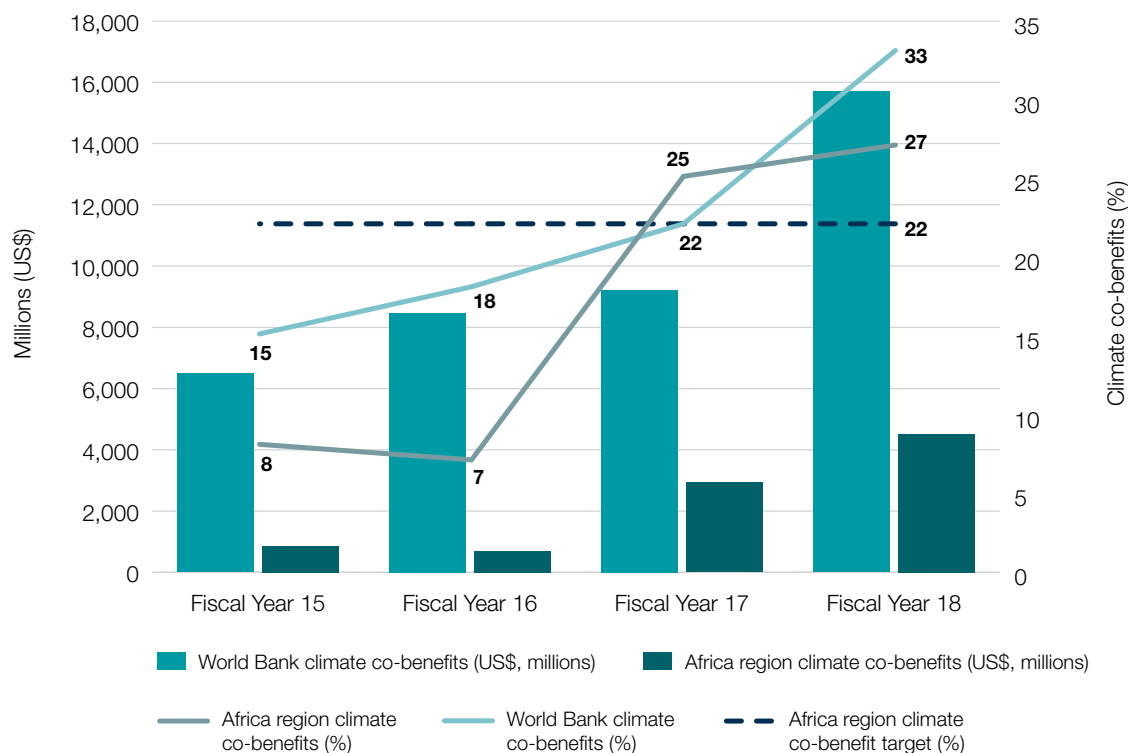
## Progress on Delivering Financing on Climate Co-Benefits

### Climate Co-Benefits for the Africa Region

**The World Bank tracks climate mitigation and adaptation co-benefits of the projects it finances** through IDA and the IBRD. A development activity provides climate co-benefits if it promotes mitigation or adaptation. It fosters mitigation through efforts to reduce or limit greenhouse gas (GHG) emissions or enhance GHG sequestration. It promotes adaptation if it enhances resilience capacities to reduce the vulnerability of people or natural systems to the impacts of climate change and risks related to climate variability.

**Climate co-benefits in Africa's FY18 deliveries reached a historical high of 27 percent** (US\$4.5 billion), surpassing our agreed 22 percent target, and the 25 percent (US\$2.9 billion) in FY17. The year-to-year behavior of the share of financing with climate co-benefits, however, can be variable (figure 1.3).

**Figure 1.3:** Annual Share of Financing with Climate Co-Benefits in World Bank Financing to Sub-Saharan Africa, FY15–FY18



Source: World Bank.

**The ACBP’s share of climate co-benefits of 42 percent (US\$3.4 billion) for FY18 is significantly higher than the Africa Region’s total of 27 percent (US\$4.5 billion) and that of the Bank at 33 percent (US\$15.7 billion).** So decisive action on ACBP implementation is likely to contribute greatly toward generating large climate co-benefits. This is especially important for the new ACBP components—Health, Education, and FCI—which have had traditionally lower co-benefits. This could change with more focused attention to address climate risks through activities and outcomes set out in the new ACBP components.

**The share of contributions of the Global Practices (GPs) to co-benefits and their contributions to the Africa target are dictated by volume of lending and high percentage of co-benefits within the GP.** Table 1.4 reveals that mitigation-based (Energy and Extractives, Transport and Digital Development, Water [hydropower]), adaptation-based (Environment and Natural Resources; Social Protection and Labor; Social, Urban, Rural, and Resilience), and those with combined benefits (Agriculture) are contributing most to the co-benefits. The higher co-benefits from these GPs are attributed to the stronger link between the activities in the project and their intent to addressing climate risks and vulnerabilities. With less-direct links (e.g., Governance), the co-benefit capture is lower. There are opportunities to increase the level of co-benefits by deepening the narrative and spelling out the indirect pathways and linkages with climate patterns (e.g., on trade policies, impacts on financial systems, or disease spread and malnutrition due to changing weather patterns).

Table 1.4: GPs' Co-Benefit Contributions, FY16–FY18

	Total IDA/IBRD commitment (US\$, millions)	GP commitment's share of total Africa Region commitment (%)	Total IDA/IBRD climate co-benefits (US\$, millions)	GP co-benefits' share of total Africa Region co-benefits	IDA/IBRD co-benefits (%)
Environment and Natural Resources	972	3	713	9	73
Agriculture	3,003	8	1,342	17	45
Energy and Extractives	5,960	16	2,171	27	36
Transport and Digital Development	3,185	8	1,011	12	32
Social, Urban, Rural, and Resilience	3,893	10	1,012	12	26
Water	3,835	10	799	10	21
Social Protection and Labor	4,734	13	647	8	14
Trade and Competitiveness	1,222	3	85	1	7
Macroeconomics and Fiscal Management	1,474	4	102	1	7
Macroeconomics, Trade, and Investment	919	2	59	1	6
Health, Nutrition, and Population	2,667	7	145	2	5
Finance, Competitiveness, and Innovation	924	2	21	0	2
Education	2,551	7	17	0	1
Governance	1,661	4	8	0	0
Finance and Markets	329	1	0	0	0
Poverty and Equity	409	1	0	0	0
<b>Total</b>	<b>37,737</b>	<b>100</b>	<b>8,132</b>	<b>100</b>	<b>22</b>

### Climate Co-Benefits by Cluster and Component of the ACBP

**All three ACBP clusters (strengthening, powering, and enabling resilience) and related ACBP components are making significant contributions on delivering climate co-benefits.** Table 1.5 provides the contribution of the current portfolio up to June 30, 2018. A closer look at the current delivery of co-benefits provides insights and lessons that can inform future pipelines.

**Powering resilience, through a focus on renewables, provides the highest level of co-benefits, reaching as high as 52 percent, with Geothermal delivering as high as 81 percent, followed by Solar at 60 percent and Hydropower at 30 percent.** Overall, the cluster delivers US\$2.3 billion in financing, of which US\$1.19 billion has co-benefits. While the co-benefits are well captured for mitigation, there is an opportunity through the projects to increase the co-benefits through resilience elements integrated within the projects.

**The strengthening resilience cluster has the largest volume of financing: US\$15.89 billion, with US\$4.88 billion delivering co-benefits with an overall mean of 31 percent co-benefits.** This cluster is the largest, with 13 components, which explains the high volume of lending. The cluster delivers co-benefits through enhanced resilience and adaptation benefits and capacity building through investments on natural, physical, and human capital.

**Projects associated with natural and physical capital have slightly higher co-benefits contributions (33 percent to 35 percent, respectively) compared to human and social capital (19 percent).** Human capital, which includes two new ACBP components—Health and Education—has contributed to additional capture of co-benefits (table 1.5). Meanwhile, Social Protection, which has a sizeable portfolio, contributed with about 26 percent.

**The enabling resilience cluster has 12 percent climate co-benefits' financing, reflecting a mix of operations, knowledge, and technical assistance that enable better management of climate risks.** The Africa Hydromet Program has a strong focus on early warning systems, hydrometeorological systems, and climate information, making it a key pillar of this cluster. Strategic Country Engagement for Nationally Determined Contributions (NDCs) and Harnessing Satellite Technology for Innovation and Climate Resilience are new components that will provide more systematic engagement at the country level, and ensure that Africa benefits from technological innovations, respectively.

**The methodology for the capture of climate co-benefits is more definitive for mitigation and more nuanced for adaptation projects.** Opportunities to address climate risks, or to reflect these more explicitly, must not be missed. This is especially necessary for development policy operations in which the pathways to address climate risks and vulnerabilities may not be obvious at the outset.

**Whether face to face, webex, or e-learning, Climate Change boot camps and routine and customized training have enhanced capacity to meet corporate and regional climate commitments.** Recent boot camps in East and West Africa were well attended and drew participation task teams, program leaders, country program coordinators, and operational staff. Focused training on the full package of commitments—screening; co-benefits; GHG accounting; and shadow price, Systematic Country Diagnostics (SCDs), and Country Partnership Frameworks (CPFs)—translates into increased awareness and capacities that yield more effective design and delivery of climate action within investments, including investment project financing (IPF), and Development Policy Operations (DPOs).



**Table 1.5:** Contribution to Climate Co-Benefits by ACBP Cluster and Component, FY16–FY18

ACBP cluster/component	Projects in ACBP		Projects in ACBP with climate co-benefits		
	Number of projects	Funding (US\$, millions)	Number of projects	Funding (US\$, millions)	Funding with co-benefits (%)
<b>Strengthening resilience</b>	213	15,886	172	4,877	31
<i>Natural capital</i>	116	6,861	106	2,436	35
Climate-Smart Agriculture (CSA)	60	4,109	54	1,528	37
Climate-Resilient Landscapes (Drylands)	17	418	16	203	49
Climate-Resilient Landscapes (Forests)	15	432	14	130	30
Water	9	1,477	9	397	27
Integrated Watershed Management <sup>a</sup>	3	206	3	87	42
Climate-Smart Ocean Economies	12	220	10	92	42
<i>Physical capital</i>	43	5,251	38	1,738	33
Climate-Smart Cities	15	2,039	14	601	29
Coastal Resilience (West Africa)	3	72	2	63	87
Climate-Smart Transport	25	3,139	22	1,074	34
<i>Human and social capital</i>	54	3,774	28	703	19
Social Protection	23	2,383	8	612	26
Addressing Drivers and Impacts of Migration	5	45	3	3	7
Climate-Smart Education <sup>b</sup>	15	1,010	9	16	2
Climate-Smart Health <sup>b</sup>	11	336	8	72	22
<b>Powering resilience</b>	30	2,266	26	1,185	52
Solar	20	1,536	18	928	60
Hydropower	9	663	7	202	30
Geothermal	1	68	1	55	81
<b>Enabling resilience</b>	16	48	2	5	12
Africa Hydromet Program					
Harnessing Satellite Technology for Innovation and Climate Resilience <sup>b</sup>	2	47	2	5	10
AFRI-RES Facility	14	1,05	11	n.a.	n.a.
Strategic Support for NDCs <sup>b</sup>		3,10			
	<b>259</b>	<b>19,249</b>	<b>200</b>	<b>6,068</b>	

Note: Figures are for projects to be approved January 2016 through June 2018. These figures include trust-funded co-benefits. N.a. = not available.

a. Areas: Niger, Chad, Zambezi, Lake Victoria.

b. Denotes new ACBP components; for ongoing support to NDCs; support to NDCs here as TA is not part of the totals.

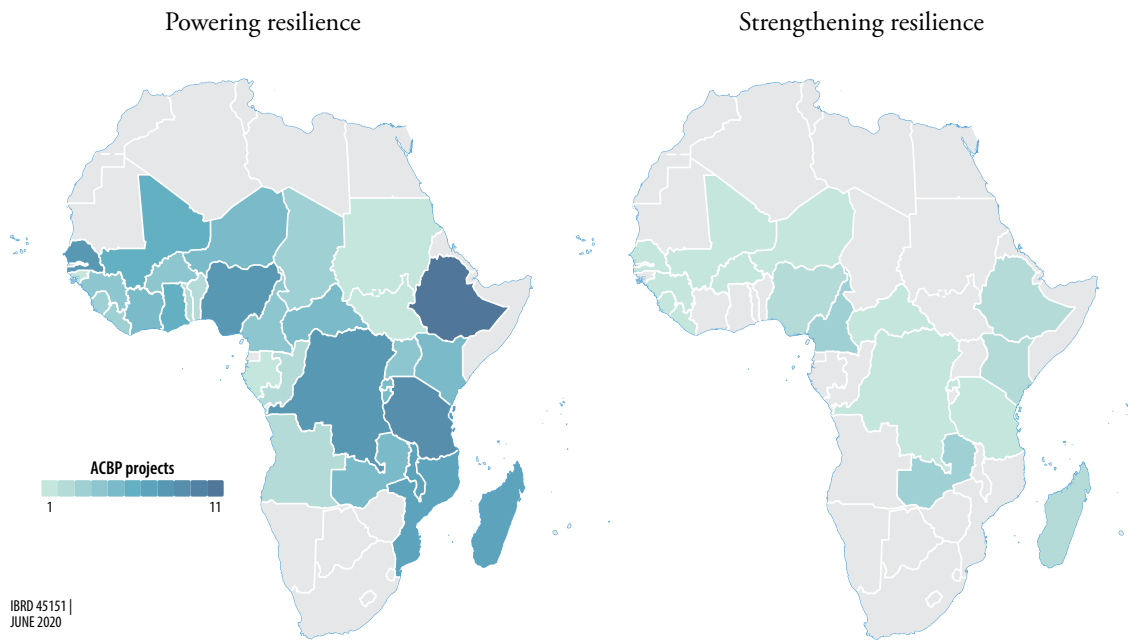
## Geographic Coverage of ACBP Projects

The ACBP finances projects in the strengthening resilience cluster in 30 countries, including interventions in support of more than one form of capital (natural, physical, and human or social). The projects cover most of the region, with the highest number in Ethiopia (11), Tanzania (nine), Nigeria (eight), and the Democratic Republic of Congo (eight). (See map 1.1, panels a and b.)

Ethiopia has a large portfolio of projects that covers various ACBP components: CSA, Climate-Smart Cities, Climate-Resilient Landscapes, Social Protection, Health, Education, and Integrated Watershed Management. These address core development issues, while addressing climate risks through targeted interventions.

The powering resilience cluster is being implemented in 16 countries in the region, with the highest number in Zambia (three) and Cameroon (three). In Cameroon, the projects are improving the national electricity transmission network, and institutional capacity for development of hydroelectric resources on the Sanaga River Basin, which enhances the resilience of the populations in multiple ways.

**Map 1.1:** Implementation of the Strengthening and Powering Resilience Clusters of the ACBP, by Country



Note: The coverage was for projects from FY16–FY18, except for those that are regional or subregional in scope.

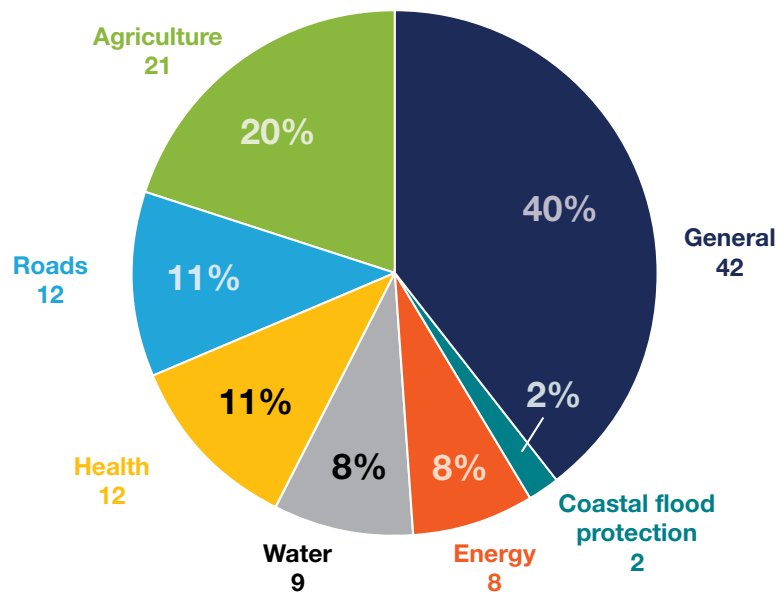
## Enhancing Climate Co-Benefits through Upstream Climate Screening

**As per the IDA17 and 18 commitments, all IDA operations must be screened for climate and disaster risks.** This applies also to IBRD commitments since FY18, as called for under the World Bank Group's Climate Change Action Plan (CCAP). The climate and disaster risk screening process and supporting tools have helped scale up and support the mainstreaming of climate and disaster resilience in operations, and in meeting the co-benefit compliance.

**The theory of change that underpins upstream climate screening, which is mandatory for all IDA and IBRD projects, can translate into increased capture of climate co-benefits.** Screening outputs provide an informed basis through which to articulate the intent of addressing climate vulnerability in the project documents and subsequent design, which can lead to explicit linkages to climate activities and co-benefits.

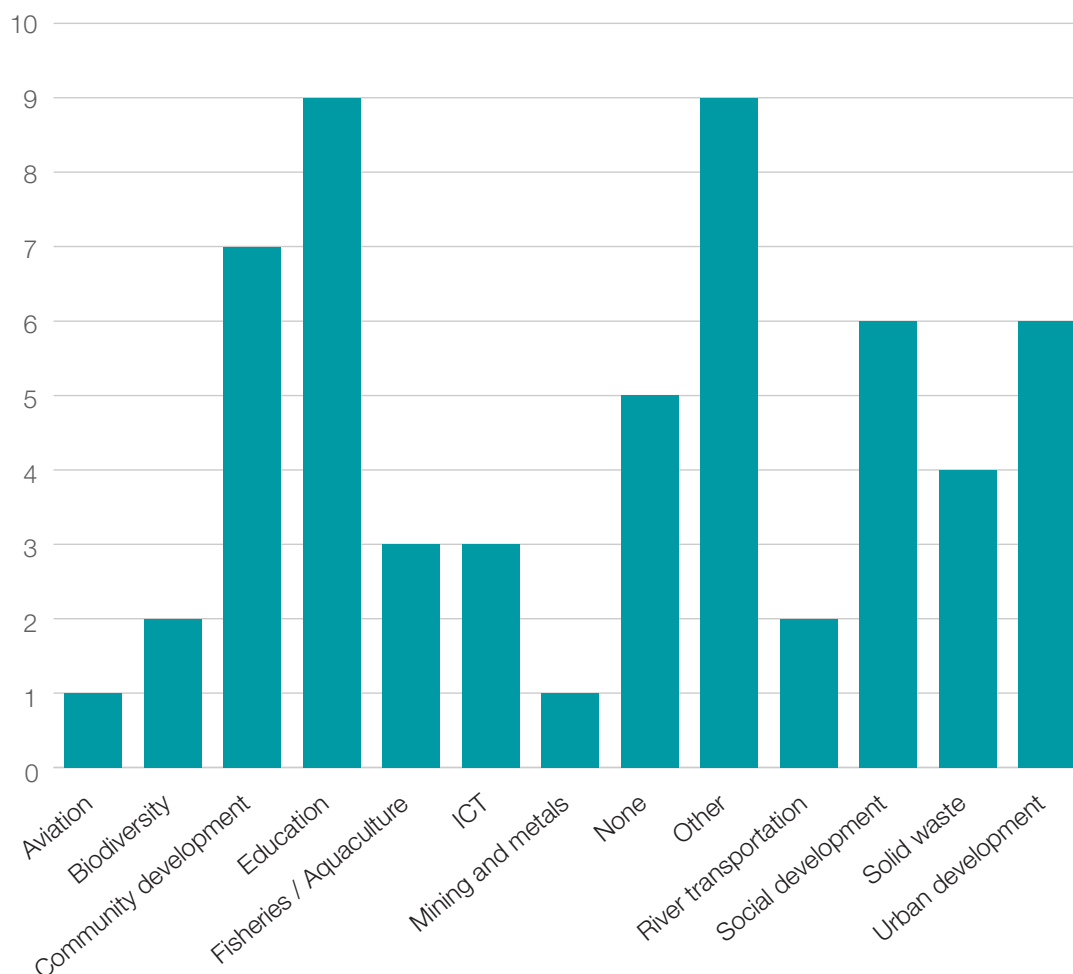
**In FY18, 106 projects were screened using the World Bank Climate and Disaster Risk Screening Tools.** Figure 1.4 demonstrates the usage by sector tool, and figure 1.5 shows further the additional sectors to which the menu-driven general tool was applied. The results indicate a good representation of all the sector tools: both sustainable development (agriculture, water, energy, roads) and unsustainable development sectors (health, education).

Figure 1.4: Sector Screening Total Usage Summary for ACBP Projects, FY18



Source: World Bank.

Figure 1.5: Subsector Tool Usage for General Tool Screenings for ACBP Projects, FY18

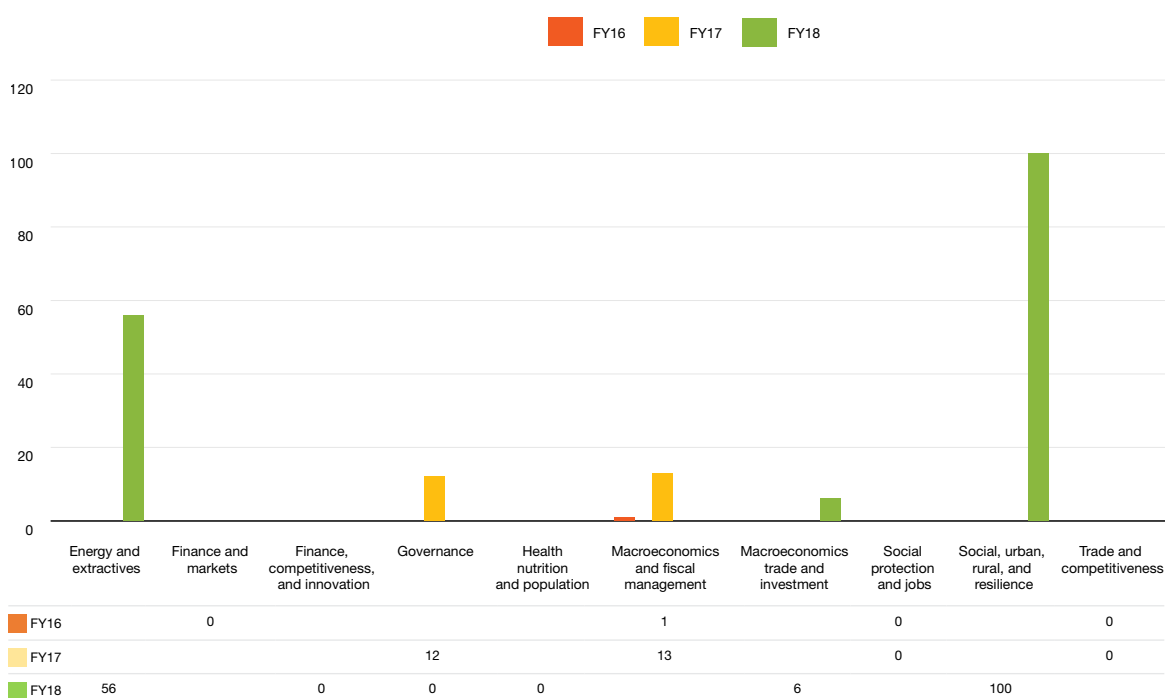


Source: World Bank.

### Capturing Climate Co-Benefit Opportunities in Development Policy Operations

Certain GPs have made progress integrating climate mitigation and adaptation considerations within Development Policy Operations (DPOs). The share of climate co-benefits against total IDA/IBRD committed amounts has increased in African DPOs, from 1 percent in FY16 to 22 percent in FY18. However, this increase is not uniform across GPs: three DPOs with the high co-benefit percentages underpin this pattern (see figure 1.6 and table 1.6). The high percentage share for Energy and Social, Urban, Rural, and Resilience in FY18 reflects the result from one DPO each. Kenya's Catastrophe-Deferred Drawdown Option (Cat-DDO), for example, with a strong focus on managing disaster and climate risks proactively, coupled with key policy reforms to strengthen the country's ability, received 100 percent climate co-benefits. Macroeconomics and Fiscal Management GP in FY17 (now Macroeconomics, Trade, and Investment) had multiple DPOs, and the high co-benefits percentage received by the Malawi Agriculture DPO (56 percent) is moderated by other operations that have limited or no co-benefits. Thus, high lending volume DPOs with low co-benefits percentages can limit the achievement of GP targets, and the overall Africa Region co-benefits. See figure 1.6.

Figure 1.6: Share of Climate Co-Benefits in Africa Region DPOs



Source: World Bank.

Table 1.6: DPOs with More than 50 Percent Co-Benefits, FY16–FY18

FY	Project name	Global Practice	Total climate co-benefits over total IDA/IBRD commitment (%)	Total IDA/IBRD commitment (US\$, millions)
FY17	Malawi Agriculture Support and Fiscal Management DPO	Macroeconomics and Fiscal Management	55.56	80
FY18	Rwanda Energy Sector Development Policy Loan	Energy and Extractives	56.04	125
FY18	Kenya—Disaster Risk Management Development Policy Credit with a Cat-DDO	Social, Urban, Rural, and Resilience	100	200

### Looking Ahead

Looking ahead at the Africa Region pipeline, task teams are working with GP teams and the Climate Change Group to maximize the potential of climate-informed DPOs. Building on recent progress and lessons learned, guidance notes, catalogues of prior actions, and FAQs have been developed to raise awareness of climate co-benefit opportunities. Further opportunities lie in mainstreaming climate considerations in a more upstream manner through systematic screening for climate risks, particularly in the adaptation context, to ensure a better capture of climate co-benefits.



A brief review of FY18 pipeline ACBP DPOs with high lending volumes reveals that a key step to enhance co-benefits lies in identifying the sectors that are directly or indirectly associated with policy reforms (or lack thereof). Direct effects are drivers of climate impacts, such as poor agriculture policies, or weak macro policies. Indirect effects include weak policies that will result in climate impacts unfolding or cascading, such as water subsidies that may lead to less efficient management of the resource, leading to increased water stress exacerbated by climate change. Early identification of all relevant sectors, coupled with a systematic screening for climate risks and impacts, will inform prior actions for policy reforms and enhance the narrative to leverage climate co-benefit opportunities.

## Strategic Upstream Country Engagement

### Context

**In FY18, 10 SCDs<sup>4</sup> and three CPFs<sup>5</sup> were completed and presented to the Board).**

Strategic upstream climate considerations through SCDs, CPFs, and strengthening linkages with NDCs are called for under IDA, the CCAP, and the upcoming post-2020 corporate commitments. IDA17 and IDA18 include a climate change theme with mandates to include climate risks as part of the SCD analysis and in the CPF. IDA18 goes further and includes a policy commitment to reference a country's (NDC) to the 2015 Paris Agreement in both the SCD and the CPF, and the Climate Action Plan calls for IBRD countries to do likewise. The upcoming corporate post-2020 climate action and targets include the theme "Strengthening Transformational Policies and Systematic NDC Support."

**The Africa Region has increased upstream strategic integration of climate change risks and opportunities in SCDs and CPFs, and has enhanced linkages with NDCs, allowing increased mainstreaming of climate co-benefits.** An assessment done through the ACBP focused on three aspects:

- Incorporation of climate change aspects in SCDs and CPFs, including risks and vulnerabilities and reflection of countries' NDCs.
- How SCDs and CPFs have gone beyond meeting corporate commitments toward more systematic incorporation of risks and vulnerabilities and explicit links to the twin goals in SCDs and CPFs.
- Comprehensive and strategic incorporation of the NDC and, to some extent, more upstream assessments of climate co-benefits for the Africa Region's CPFs.

**The ACBP's Forward Look includes a new component under enabling resilience on "Strategic Support for NDCs"** to capture the multiple streams of strategic opportunities and ensure more effective upstream and country engagement to enhance the visibility, ownership, and strategic value added for climate action at all levels through systematic mainstreaming. See Appendix A for methodology.

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4 FY18 SCDs: Benin, Burundi, Cabo Verde, the Democratic Republic of Congo, Guinea, Liberia, Niger, Sierra Leone, South Africa, Zambia.

5 FY18 CPFs: Guinea, Niger, Tanzania.

## Key Findings

### Compliance with Current CCAP and IDA Commitments

#### *Climate Risks and Vulnerabilities*

##### **All SCDs and CPFs completed in FY18 incorporate climate risks and vulnerabilities.**

SCDs reflect climate-related risks as a risk to sustainability, and largely identify them as one of the factors that impedes sustainability in terms of social (e.g., loss of lives, food security) and environmental dimensions (e.g., drought and flooding).

##### **Climate risks and vulnerabilities are primarily discussed within the sustainability chapter**

as well as incorporated across sector analyses, in which corresponding sectoral impacts are addressed. Vulnerabilities primarily link climate change to pressures on the environment (e.g., depletion of water resources), agriculture and livestock productivity, and physical infrastructure. To a lesser extent, corresponding social impacts, such as income fluctuations, food security, and malnutrition, are discussed. Climate change is generally not deemed as a root cause of poverty and inequality. Rather, it is considered to exacerbate them, among other factors, by compounding detrimental effects, such as environmental degradation and weak resilience to environmental shocks (e.g., natural disasters) or to specific vulnerable sociodemographic groups or segments of the population (e.g., rural households).

##### **All CPFs incorporated climate risks and vulnerabilities drawn from the SCDs and included at least one climate-related investment or Advisory Services and Analytics (ASA).**

Climate-related narratives also support the analysis and subsequent recommendations to continue or initiate policies, plans, and projects that address risks and vulnerabilities, and identify potential or provide additional funding. For example, drought and flooding are addressed with corresponding climate resilience in food security and CSA projects or ASAs. All CPFs include one or more climate-related investment projects or ASAs.

#### *Incorporating NDCs*

##### **Both SCDs and CPFs reflect an upward trend in highlighting NDCs in country strategies.**

From FY16 to FY18, there were observed increases in completed SCDs and CPFs in referencing a country's NDC. In FY18, 50 percent of the SCDs refer to the country's NDC, to a large extent in the policy analysis of the sustainability chapter or sectoral narratives. In FY18, 100 percent of CPFs referenced NDCs, mainly as an important policy commitment in line with government strategies (table 1.7, panels a and b).

**Table 1.7:** Incorporating NDCs into SCDs and CPFs, FY16–FY18

a. SCDs				b. CPFs			
FY	No. of SCDs with NDC references	Total no. of SCDs	%	FY	No. of CPFs with NDC references	Total no. of CPFs	%
2016	0	12	0	2016	0	6	0
2017	2	5	40	2017	4	7	57
2018	5*	10	50	2018	3	3	100

*Note:* The PCN review for four of the five FY18 IDA SCDs without NDC references took place in FY17 or earlier. There was no requirement for NDC reflection at that time (IDA17 did not require SCDs or CPFs to reflect NDCs).

## Going Beyond Commitments

The following analysis describes the efforts that go beyond the current policy commitments to systematically embed climate change and NDCs in SCDs and CPFs, which can inform and strengthen future practice. The analysis developed a set of criteria to assess the incremental level of integration of NDCs in SCDs and CPFs, ranging from references to strategies and policies, incorporating NDCs in sectoral analysis to include references to knowledge gaps, results framework, or investments (see appendix C [table A.1] for details).

### *Systematic Country Diagnostics*

**SCDs provide an opportunity for more robust integration of climate change considerations in economic analyses.** Climate change is regarded in all SCDs as a risk to the sustainability of achieving the Bank’s twin goals. However, some SCDs are going beyond this. In one case, the lack of tools and incentives for poor populations to manage natural resources and support climate-resilient livelihoods was identified as a binding constraint to achievement of the twin goals. In some cases, data on historical trends and economic forecasts of the impact of climate change on a country’s GDP are provided.

**Priorities listed in a country’s NDC can help strengthen the argument or provide the basis for recommendations of climate change–related priorities in SCDs.** Some SCDs have used the priorities in the NDC to strengthen the arguments for action in priority sectors that could best contribute to adaptation and mitigation actions. In one instance, the SCD cites the country’s NDC recommendation to conduct further studies that would help estimate the cost of implementation. Table 1.8 presents a breakdown of the NDC analysis in SCDs.

**Table 1.8:** Assessment of NDCs in SCDs, FY18

Assessment criteria	Frequency count and countries (total SCDs = 10)	Notes
Does the SCD make explicit reference to NDCs?	5: Benin, Congo, Dem. Rep., Liberia, South Africa, Zambia	In compliance with IDA18 policy commitment.
Does the SCD refer to the NDCs in the analysis on government strategies and policies?	2: Congo, Dem. Rep., Zambia	Zambia’s SCD includes the NDC in discussions of national policies and strategies on climate change; addresses cost of implementation, using a combination of traditional and nontraditional sources of finance, including domestic sources.  Congo, Dem. Rep.’s SCD questions reliability of the NDC as a planning instrument, given uncoordinated effort in its formulation.
Does the SCD incorporate NDCs in sectoral analysis?	2: Benin, Zambia	Benin’s SCD recommends designing programs using an Adaptive Social Protection Approach to reduce household area vulnerability to climate shocks, which align with NDC priority sectors for investment.  Zambia’s SCD uses the NDC to strengthen arguments for action and synergies in priority sectors that could best contribute to adaptation and mitigation actions.
Does the SCD recognize NDC-related knowledge gaps?	1: Liberia	Liberia’s SCD recommends conducting a study to estimate the cost of NDC implementation.

Here, children proudly show off their tablet. Governments need to achieve commitments to mitigate and adapt to climate change for future generations. (Shutterstock)



**SCD analytics provide a great opportunity to identify knowledge gaps linked to NDCs.** Half of the SCDs reviewed identify climate-related knowledge gaps. Recommended knowledge activities include household-level surveys to understand the socioeconomic aspects of climate change impacts or studies on low-carbon urban planning. One SCD recommends conducting a study to estimate the cost of NDC implementation.

#### *Country Partnership Frameworks*

**Climate change adaptation and resilience are better mainstreamed by making synergies across several pillars and objectives in the CPF.** CPFs typically integrate climate change in one pillar, usually under a Natural Resource Management (NRM) or environment pillar. However, some CPFs have incorporated climate change narratives across several pillars. Some CPFs took action on climate-specific knowledge gaps recommended in the SCD through ASAs.

#### **Assessing how climate co-benefits may be maximized can only strengthen CPFs.**

Examples include two CPFs that explicitly indicate plans to maximize co-benefits, with one specifically leveraging a DPO as an entry point for strengthening climate resilience. Going further, one CPF includes an indicator tracking the percentage of projects providing climate co-benefits.

**Systematic action on NDCs can be reflected in results matrixes.** One CPF reflects the NDC in the intervention logic, objectives, or ongoing activities (i.e., projects or trust funds). This CPF explicitly indicates an intention to support implementation of the NDC and includes an indicator tracking the achievement of the NDC objectives or actions related to natural resource management. Table 1.9 presents a breakdown of the NDC analysis in CPFs.

Table 1.9: Assessment of NDCs in CPFs

Assessment criteria	Frequency count countries (total = 3)	Notes
Does the CPF make explicit reference to the NDCs?	3: Tanzania, Guinea, Niger	In compliance with IDA18 policy commitment.
Does the CPF link include government strategies and policies to the NDCs?	3: Tanzania, Niger, Guinea	Tanzania: CPF makes an explicit link between national development strategies and NDC to support adaptation in the focus areas of the CPF Niger: CPF includes a footnote on NDC's alignment with the Vision 2035 long-term development strategy Guinea: CPF makes an explicit link to support implementation of NDC with the PNDES
Does the CPF make strategic cross-sectoral linkages to NDCs?	None	None
Are the NDCs reflected in the results framework or in the objective/intervention logic/ indicators?	1: Guinea	NDC appears in Objective 3 discussion and intervention logic CPF Indicator 3.2 tracks the achievement of the NDC objectives/actions related to natural resource management.
Does the CPF explicitly indicate an intention to support implementation of NDC and, if so, are there any specific ASAs or investments mentioned?	1: Liberia	CPF identifies the following NDC-related activities: Pipeline IDA projects: (i) Mining Governance Project—additional finance (FY20); (ii) Climate Change and Biodiversity Capacity Building Project (FY20); (iii) Improving Institutional Capacity and Local Governance Project (FY19) Other ASA: Sectoral Environment and Social Strategic Assessments (FY18)

## Opportunities and Actions for Strengthened and Transformational Country Engagement

### For Systematic Country Diagnostics

**SCDs have made strides in addressing climate vulnerabilities, climate impacts, and identifying risks to sustainability, yet there is room for further deepening these aspects in the diagnostics.** SCDs could be better at (i) identifying climate change as a binding constraint to achieving the twin goals; (ii) analyzing the socioeconomic impacts of climate change; (iii) identifying opportunities for markets and jobs creation, generating broader economic growth objectives; and (iv) integrating climate change into less traditional sectors, such as human development and institutional capacity building. If information on these themes is not available, this should be more systematically identified as a knowledge gap for further exploration.

**There are real opportunities for SCDs to be informed and strengthened by country NDCs and their underlying analysis.** NDCs contain sector priorities and analysis that could support sectoral analysis in SCDs. In addition to NDCs, other national strategies, action plans, and policy frameworks could be more explicitly cited in the sectoral analysis (e.g., National Adaptation Programmes of Action [NAPAs]) to help identify national priorities and gaps for climate action.



## For Country Partnership Frameworks

**CPFs can prioritize climate co-benefits' assessments and leverage their potential contribution to regional targets.** Incorporating climate co-benefits' analyses and explicitly illustrating their overall contribution to sustainability or achieving the twin goals could help stimulate action at scale. Further, CPFs could show increasing ambition on mainstreaming climate change into the portfolio by illustrating increasing co-benefits targets or including comprehensive co-benefits' assessments showing current and future mitigation and adaptation benefits from investment projects.

**CPFs can help implement NDCs by identifying NDC-related pipeline projects and ASAs.** NDCs are mainly referenced in CPFs to provide consistency with national climate policies and strategies. However, CPFs could further capitalize on NDC priority actions that can be translated into investment projects. Conditional and unconditional mitigation and adaptation targets provided in country NDCs could be more explicitly considered in CPFs to determine where Bank programs and projects could contribute or where targeted support could be given to achieve NDC goals. In addition, CPFs could prioritize ASAs that explicitly support the implementation of NDCs.

## For Client NDC Engagement

**Client engagement with countries has progressed in several countries through policy dialogue and linkages with investments.** Current and future NDC engagements should continue seeking to increase the Bank's strategic engagement. The ACBP Forward Look includes a new component under enabling resilience through client country engagement on NDCs. This will allow for deepened strategic engagement and scale-up of investments within the Bank and client countries. This is discussed in the next section.

# Assessment of the Contribution of ACBP Projects to NDC Implementation

## Key Messages

- The ACBP portfolio of projects is increasingly responsive to countries' NDCs. An in-depth analysis of the portfolio of projects shows that the number of NDC-referenced projects doubled between FY16 (seven projects totaling US\$548 million) and FY18 (14 projects totaling US\$1,507 million) with total financing almost tripled.
- Between FY16 and FY18, 41 projects (or 23 percent of the ACBP portfolio) make direct references to NDCs in their projects' documents, which amount to US\$4.02 billion IDA/IBRD lending (40 IPF and one Program for Results (P4R)). The projects provide indirect and direct support to 30 countries to address their NDCs. Key countries with most NDC supporting projects include Senegal, Niger, and Togo.
- The analysis reveals that World Bank projects are supporting the implementation of NDCs in countries, and that they are aligned with actions and targets of NDCs (17 out of 41 projects) and inclusion as part of project design (four out of 41 projects). Projects' results framework has resulted in appropriate tracking and reporting of adaptation and mitigation actions (20 out of 41 projects).

## Context

The ACBP portfolio of projects is responsive to countries' NDCs and their commitments to the Paris Agreement. The Second Progress Report (World Bank 2017a) assesses the finance of the NDC-related portfolio by identifying a sectoral alignment between ABCP projects' components and the NDC priorities of corresponding client countries. The analysis concludes that, as of October 2017, 80 percent (or 163 out of 204) of ACBP projects were aligned with sectoral priorities articulated in NDCs. Commitments for these projects totaled US\$18.3 billion—83 percent of the World Bank's total financial commitments under the ACBP (World Bank 2017a). The Second Progress Report also identifies opportunities for NDC support in transport, agriculture, cross-cutting areas (capacity building, disaster risk management, and climate services), energy, social development, land use, and forestry.

In this third report, the NDC analysis of the ACBP portfolio identifies specific contributions to NDC implementation. The main objectives are to (i) take stock of the ACBP portfolio and identify the level of reference to NDC provided in project descriptions (see table 1.10); and (ii) identify good practices of NDC implementation projects.

The analysis targeted 49 ACBP projects from FY16 to FY18 that made explicit reference to NDCs in their project documents (i.e., project appraisal document, project concept note, or project paper). The results were aggregated for portfolio analysis to understand sectoral and geographical coverage of NDC-referenced projects.

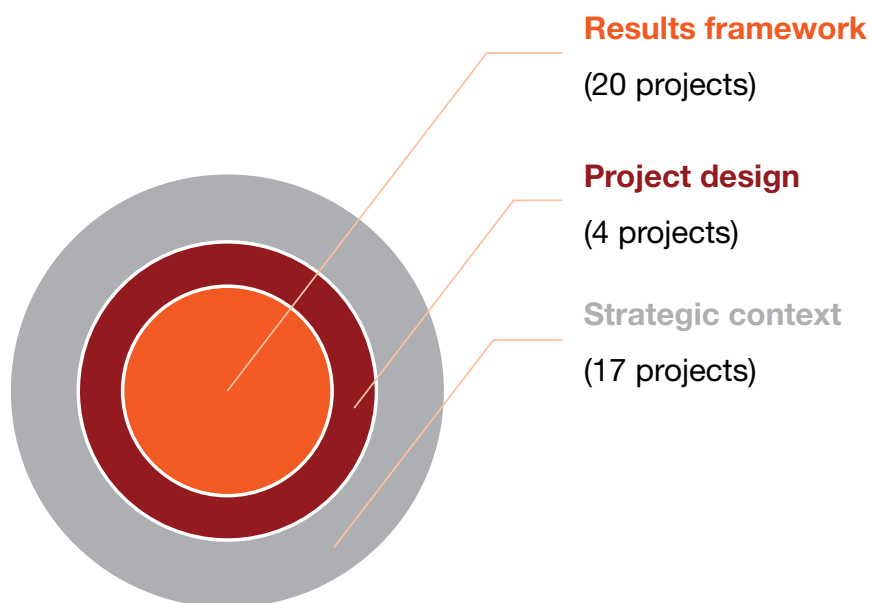
**Table 1.10:** Definition of NDC Reference Levels

NDC Reference Level	Definition
Low: strategic context	The strategic relevance of a project to NDC is explained in a project document. However, the linkage between project objective/component(s) to NDC priority is not specified.
Medium: project design	In addition to indicate strategic aims to support NDC, the contribution of project objective or component(s) to NDC priorities and actions are explained in a project document.
High: results framework	A project includes specific climate change mitigation/adaptation result indicators to support deliver of an NDC target/action.

## NDC-Referenced Projects in ACBP Portfolios

**The NDC analysis reveals that 41 projects (or 23 percent of the ACBP portfolio) make direct references to NDCs in their project documents for FY16–18, which amounts to US\$4.02 billion IDA/IBRD lending.** This includes 40 IPFs and one P4R project. Seventeen projects include NDCs as part of their country strategic context; four include activities within their higher development objectives or components that directly support NDC implementation; and 20 integrate mitigation and adaptation indicators that support NDCs implementation into their results framework (figure 1.7).

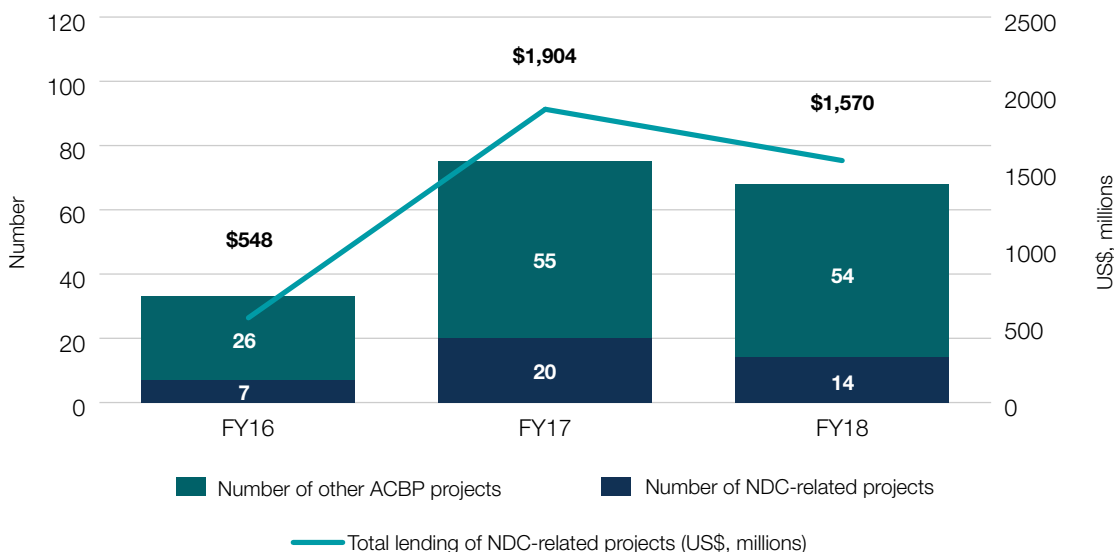
**Figure 1.7:** NDC-Referenced ACBP Portfolio Breakdown by NDC Reference Type, FY16–FY18



Source: World Bank

**The number of NDC-referenced projects doubled between FY16 (seven projects totaling US\$548 million) and FY18 (14 projects totaling US\$1,570 million)** (figure 1.8). The total number of NDC-referenced projects in FY17 and FY18 are 20 and 14, respectively, which more than doubled those in FY16. The total lending of NDC-referenced projects has almost tripled from FY16 (US\$548 million) to FY18 (US\$1,507 million).

Figure 1.8: NDC-Referenced ACBP Portfolio Breakdown, FY16–FY18



Source: World Bank

The portfolio analysis illustrates how NDCs can be referenced at various levels: strategic context, project design, and results framework (table 1.11). For example, the Transformation of Agriculture Sector Program Phase 2, which aims to promote the commercialization of agriculture value chains in Rwanda, is nested within the country’s Strategic Plan for Agriculture Transformation (PSTA4) and the National Strategy for Transformation (NST1), both aligned with the country’s NDC. The Cameroon Transport Sector Development Project aims to strengthen transport planning and improve efficiency and safety on the Yaounde-Bamenda transport corridor. It goes one step further in supporting the development of a climate resilience and adaptation strategy and an action plan to guide Cameroon to meet its mitigation commitment as contribution to the NDC. Yet it does not include specific adaptation or mitigation indicators within its results framework. The National Agricultural and Rural Inclusive Growth Project in Kenya states within its result framework how it will support the country to achieve its NDC emission reduction targets through promoting sustainable land management and climate smart agriculture practices with quantified emission reduction potentials.

**Table 1.11:** Sample ACBP Projects that Align or Relate to NDCs within Different Levels

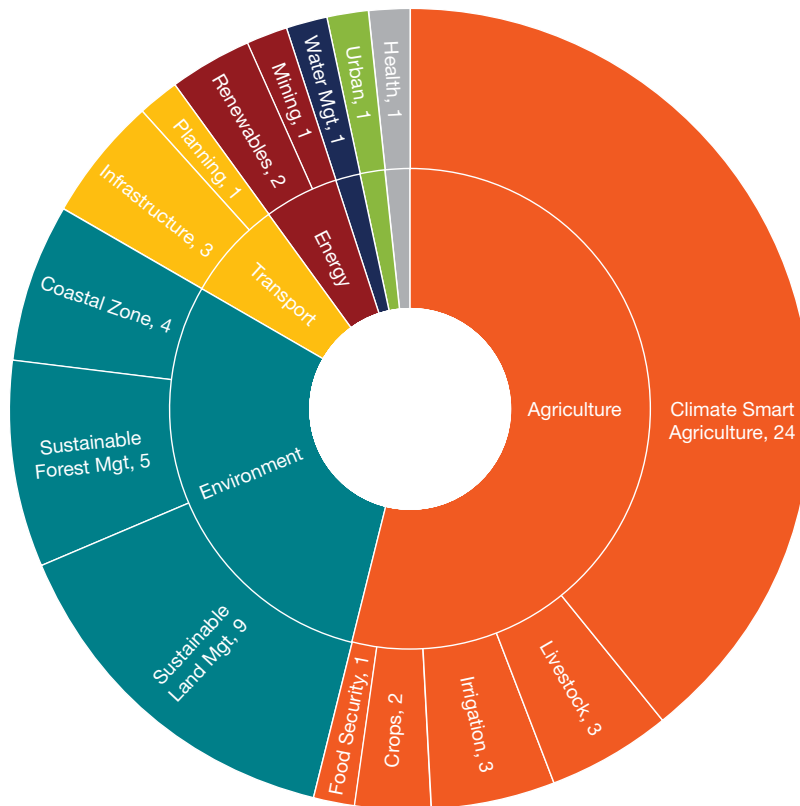
NDC reference level	Project title	Reference to link with NDC in project document
Strategic context	Rwanda: Transformation of Agriculture Sector Program P4R Phase 2 (P161876) US\$100 million, FY18	Sectoral (or multisectoral) and institutional context: PSTA4 is aligned with national policies and strategies including Vision 2050, Rwanda’s NST 1, and relevant subsector strategies. The NST 1 was designed to address Rwanda’s commitment to the SDGs, the NDC to agriculture, and the Paris Climate Agreement.
Project design	Cameroon: CMR Transport Sector Development Project (P150999) US\$192 million, FY17	Subcomponent 1.5: Climate resilience and adaptation strategy for land transport will serve as the basis for policy formulation and climate change mitigation aspects. The study will equally establish an action plan to guide Cameroon in meeting its GHG emission mitigation commitment similarly expressed in the country’s Paris Conference on Climate Change (COP21) as part of its NDC.
Results framework	Kenya: National Agricultural and Rural Inclusive Growth Project (P153349) US\$200 million, FY17	Results framework: This scenario-based analysis shows that NARIGP’s focus on promoting SLM and CSA practices has tremendous potential to mitigate GHG emissions and enhance carbon sequestration. The results indicate the type of SLM and CSA interventions that are most effective in supporting Kenya’s efforts in reaching its NDC mitigation goals. Agroforestry has the largest mitigation potential, with nearly 8 tCO <sub>2</sub> -eq per ha per year. Reducing and avoiding land degradation has the potential to reduce about 3 tCO <sub>2</sub> -eq/ha/year. Regarding the mitigation potential of specific activities that can support Kenya in achieving its NDC, this net carbon balance analysis finds that agroforestry has the largest mitigation potential, with nearly 8 tCO <sub>2</sub> -eq/ha/year. The second-largest mitigation potential comes from reducing and avoiding land degradation, which has a potential of about 3 tCO <sub>2</sub> -eq/ha/year. Two activities—livestock and fertilizer production—increase GHG emissions (livestock by 0.2 tCO <sub>2</sub> -eq/head/year and fertilizer production by 0.2 tCO <sub>2</sub> -eq/ha/year). While improved agronomic practices, nutrient management, and no tillage have a comparably small mitigation potential of 0.3 tCO <sub>2</sub> -eq/ha/year, these practices can enhance climate resilience and bring adaptation benefits at the household level.

**In terms of sectoral coverage, of the 41 NDC-referenced projects, 24 contribute to NDC implementation on CSA and nine relate to sustainable land management.**

Other main NDC subsectors supported by ACBP projects include sustainable forest management (five projects), and coastal zone management (four projects). This result is consistent with the results from the NDC analysis included in the Second ACBP Progress Report (World Bank 2017a). Gaps persist in terms of renewable energy, infrastructure and roads, fisheries, climate services and DRM, water management, and health. The sunburst diagram in figure 1.3 summarizes the sectoral alignment of NDC-referenced projects. Individual projects could contribute to multiple NDC subsectors. Thus, the sunburst diagram includes 61 references to subsectors among 41 projects. For instance, the Mining and Forest Governance project in the Central African Republic (P161973; IPF; US\$10 million; FY18) provides support to both mining and sustainable forest management subsectors, which are included in the country’s NDC. Therefore, double-counting will occur in the tree map for ACBP projects that provide NDC support to different sectors or subsectors.

A project's sectoral and subsectoral alignment with NDC has been determined based on the specific country's NDC pledges. Therefore, a climate-related project might not be included if the specific sector is not addressing an NDC commitment. For example, the Ghana Commercial Agriculture Project Additional Financing (P162525; IPF; US\$60 million; FY18), which is largely an irrigation development project as defined in its Project Paper, does not contribute to NDC implementation in the irrigation subsector, given that irrigation is not a subsector identified under Ghana's NDC. However, since other projects' activities provide direct support to the CSA subsector, the project's NDC subsector assigned for this exercise is considered as contributing to the targets for CSA, as included in Ghana's NDC.

Figure 1.9: NDC-Referenced ACBP Portfolio Breakdown by NDC Sectors, FY16–FY18



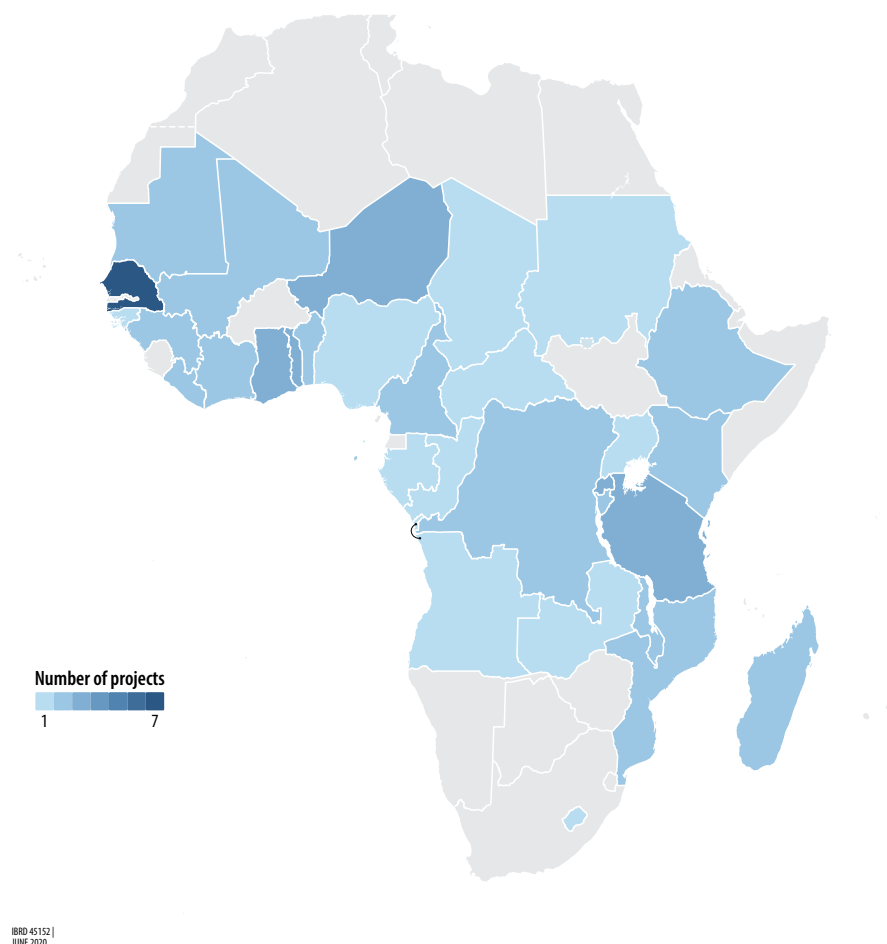
Source: World Bank.

Note: The value represents the number of projects. Since one project may support more than one sectors or subsectors, the values are not mutually exclusive.



Thirty countries were associated with the 41 NDC-referenced projects, with a total portfolio reaching US\$4.02 billion. This includes four projects in Senegal, three projects each in Togo and Niger (map 1.2).

Map 1.2: NDC-Referenced ACBP Projects, FY16–FY18



### Good Practice Case Studies of NDC Support

The analysis identified many good practices from the ACBP portfolio in which NDC implementation support is provided and documented. This section provides six such case studies (table 1.12, table 1.13, and table 1.14). Besides making explicit reference to NDCs at strategic levels, these projects offer a wide range of NDC supporting actions, which are embedded throughout project objective and component, and sometimes reflected in the project's results framework.

Table 1.12: Ethiopia: Livestock and Fisheries Sector Development Project

Ethiopia: Livestock and Fisheries Sector Development Project (P159382; IPF)		
Project	US\$153 million; approved FY18	
PDO	To increase productivity and commercialization of producers and processors in selected value chains, strengthen service delivery systems in the livestock and fisheries sectors, and respond promptly and effectively to an eligible crisis or emergency.	
NDC reference level	Project description	Country's NDC
Strategic context	<p>The project will contribute to the Ethiopia NDC for <b>emissions reduction</b>. Improving crop and livestock production practices for greater food security and higher farmer incomes while reducing emissions is the first of the four pillars that Ethiopia has identified to achieve its target, given that livestock is estimated to contribute over 40% of national emissions.</p>	<p>Ethiopia intends to limit its net GHG emissions in 2030 to 145 Mt CO<sub>2</sub>e or lower. This would constitute a 255 Mt CO<sub>2</sub>e reduction from the projected BAU emissions in 2030, or a 64% reduction from the BAU scenario in 2030.</p> <p>Sectors: agriculture (<b>livestock</b> and soil), forestry, transport, electric power, industry (including mining) and buildings (including waste and green cities).</p> <p>Total GHG emissions of Ethiopia in 2010 were 150 Mt CO<sub>2</sub>e. The sectoral GHG emission sources and their quantities were the following: <b>livestock emitted methane and nitrous oxide totaling 65 Mt CO<sub>2</sub>e, i.e., 42% of the total.</b></p>
Project design	<p>Component B: Strengthening National Institutions and Programs (US\$55.8 million). The component will assist the Ministry of Livestock and Fisheries (MoLF) in:</p> <p>Building immediate and long-term human, organizational, and <b>institutional capacity</b> of the MoLF.</p> <p>Developing <b>sector coordination</b> with climate policies and to ensure that the livestock sector, fully contributes to the NDC.</p> <p>Improving the <b>organizational and technical capacity</b> of the key actors of the livestock and fisheries sectors, including the MoLF, key public and private services providers, producer organizations, and commodity associations.</p>	
Results framework	<p>Subcomponent B.2: Policy, Planning, and Coordination:</p> <p>Sub Components will support the development of a <b>DAMS</b>, which will build on the LSIPT.</p> <p>DAMS will include the development of Tier 2 emission factors for the detailed quantification of emission reductions in the livestock sector. It will be connected to the national <b>GHG accounting system</b>, toward the reporting of GHG emissions in the context of the NDC.</p> <p>Number of system improvements in support of better livestock and fisheries service delivery achieved.</p> <p>Improvements refer to administrative, institutional, and organizational changes that positively affect livestock and fisheries sector development.</p> <p>Reduction in GHG emission intensity; data source: (i) DAMS and (ii) emission factors generated based on observed livestock practices in the project area.</p> <p>Primary National Livestock and Fisheries Monitoring and Information Systems established and operational with (i) DAMS; (2) Livestock Identification and Traceability System; and (3) Dairy Performance Recording System.</p>	

Note: Ethiopia's CPF was strategically aligned to Objective 1.3: Improved agricultural productivity and commercialization with its NDC commitment on increasing resilience in agriculture. This project contributed toward achieving the CPF objective.

Table 1.13: Nigeria: Erosion and Watershed Management Project

Nigeria: Erosion and Watershed Management Project; AF (P164082; IPF)		
Project	US\$250 million; approved FY18	
PDO	To reduce vulnerability to soil erosion in targeted sub-watersheds	
NDC reference level	Project description	Country's NDC
Project design	<p>Component 3: Climate Change Response (US\$26.37 million): AF will enable the component to expand support for <b>technical assistance</b> to advance preparation and initiation of activities identified under Nigeria's NDC to the Paris Agreement on climate change and for the issuance, deployment, and monitoring of <b>green bonds</b>.</p> <p>Subsequent activities supported by the AF will include <b>institutional capacity building to prioritize investments</b> identified under the NDC.</p>	<p>Nigeria is committed to reduce its GHG by 20% and 45% with international support.</p> <p>Soil erosion: climate change-related heavier and steadier than normal rainfall will worsen soil erosion that is already catastrophic in the south.</p> <p>Initiate a national program for IWRM at the watershed level.</p>
Results framework	<p>Land area under sustainable landscape management practices (ha)</p> <p>Net GHG emissions (tCO<sub>2</sub> -eq annually)</p> <p>Monitoring and reporting systems producing data on project progress at federal and state levels.</p> <p>Development of green bond (number). Reflects realistic achievement of green bond development. It will raise capital and investment for new and existing projects with environmentally sustainable benefits that have the capacity to meet Nigeria's NDC targets.</p>	<p>Review of Nigeria's current climate finance landscape, support needs and the international funding landscape, along with an assessment of climate finance readiness and gaps. This will include possible use of funding through the carbon market mechanisms subject to the detailed provisions of the Paris Agreement.</p>

Table 1.14: Western Africa Regional Disease Surveillance Systems Enhancement

<b>Project</b>	Western Africa (Guinea Bissau, Liberia, Nigeria, Togo) Regional Disease Surveillance Systems Enhancement (REDISSE) Phase II (P159040; IPF) US\$147 million; approved FY17	
<b>PDO</b>	To strengthen national and regional cross-sectoral capacity for collaborative disease surveillance and epidemic preparedness in West Africa; and in the event of an Eligible Emergency, to provide immediate and effective response to said Eligible Emergency.	
<b>NDC reference level</b>	<b>Project description</b>	<b>Countries' NDCs</b>
<b>Strategic context</b>	Climate change: program contributes to climate change adaptation by improving general disaster education, deployment of early warning systems (e.g., community mobilization), planning for relocation efforts, and increasing connectivity of health facilities in high-risk areas. Guinea Bissau, Liberia, and Togo have explicitly included health considerations in their (intended) NDC to emission reductions document.	Guinea Bissau, Liberia, and Togo have explicitly included health considerations in their (intended) NDC to emission reductions.  Guinea Bissau: capacity strengthening has a direct effect on improving decision making and planning for comprehensive risk management for public and private actors regarding events associated with climate variability and change in the sectors of forest, water and energy, agriculture and livestock, health, fishing, and civil protection.
<b>Project design</b>	Subcomponent 1.3: establish an early warning system for infectious disease trends prediction (US\$10.77 million):  Establishes early warning system, including the use of GIS techniques to study infectious disease patterns and make predictions on evolution of disease outbreaks, including zoonoses, and identify potential high-risk areas for regional disease outbreaks.  Activities will support monitoring trends that occur in infectious diseases, such as AMR and insecticide resistance, and the impact of climate change on infectious disease outbreaks in the region.	Liberia: health. Strengthen integrated disease surveillance response systems and emergency preparedness to prevent, mitigate, and respond to epidemics; develop early warning systems for climate-driven infectious diseases.  Nigeria: mitigation actions with largest development benefit are reducing air pollution, indoors and outdoors, with enormous immediate health and social benefits. Strategies: strengthen disease prevention and treatment for those diseases expected to increase as a result of climate change; establish early warning and health surveillance programs. Togo: priority sectors are, by order of importance: energy; agriculture; human settlements and health; water resources; coastal erosion; and land use, land-use change, and forestry.
<b>Results framework</b>	Effective surveillance of climate-dependent, vector-borne diseases with potential interspecies concern (SACIDS).	

## Client Support for NDCs

Client engagement has progressed in several countries through policy dialogue and investment linkages with funding from the NDC Support Facility<sup>6</sup> as well as bilateral and other (Public-Private Infrastructure Advisory Facility [PPIAF]) funding. The areas of NDC engagement include adaptation, mitigation, and cross-cutting work at sectoral levels and mainstreaming at large. Highlights include:

**Côte d’Ivoire and Mali** are part of a regional project, under the Adaptation of African Agriculture (AAA) to Climate Change Initiative, designed to support African countries in the operationalization of their agriculture-related NDCs, while building their capacity for NDC implementation and developing a network of expertise and knowledge exchange across the continent.

- An IFC project in **Côte d’Ivoire**, co-funded by PPIAF, supports the Ministry of Petroleum and Energy in helping to achieve the 42 percent renewable energy target. It is a two-phased approach that unlocks private investment via targeted policies, investment climate improvements, and strategic use of innovative financing mechanisms.
- Another project in **Côte d’Ivoire**, part of the WACA Resilience Investment Project (ResIP), supports adaptation actions to develop resilience of coastal areas against hydrometeorological risks. It will facilitate the multisectoral dialogue between authorities and key stakeholders to plan and implement investments contributing to coastal resilience.
- The **Mozambique** project will strengthen cooperation and collaboration mechanisms as well as develop roadmaps for actions to implement priority NDC adaptation strategies and targets. The project will enable the operationalization of the National GHG Inventory to improve mitigation target setting, tracking, and reporting to the UN Framework Convention on Climate Change (UNFCCC) and other international partners, which can be a basis for results-based financing. This can enable the development of bankable actions to attract climate investments from private, international, and domestic public sources.
- The **São Tomé and Príncipe** project will provide foundational support to enable decision makers in the country to better understand climate risks, facilitate the integration of resilience measures into policies and investment plans, and build targeted capacity to improve coordination across national institutions, government, and international partners.
- The **Rwanda** project will provide technical assistance to produce quantified targets in adaptation and mitigation and evaluate priority interventions for Rwanda’s revised NDC. It will also support the development and implementation of the Monitoring and Evaluation Framework for adaptation actions, including capacity development support. Finally, it will strengthen the national capacity to access and mobilize public and private resources to implement the NDC.

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6 The NDC Support Facility is a MDTF created and designed to facilitate the implementation of the NDC pledged by countries under the Paris Agreement in 2015. (See the NDC website, <https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs>; see the Paris Agreement website, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.) Activities are implemented in close coordination with and in support of the country engagement process of the NDC Partnership, a growing global coalition of developed and developing countries and international institutions. See the NDC Partnership website, <http://www.worldbank.org/en/programs/ndc-support-facility>, and the NDC Support Facility website, <https://www.worldbank.org/en/programs/ndc-support-facility>.

The **Uganda** project will support the mainstreaming of climate and disaster risk screening for projects; provide technical assistance for pipeline development through support to two key investment priorities identified in the SPCR and FIP investment plans; and support a coordination mechanism for streamlining a pipeline of climate change projects and leveraging climate financing. Through complementary parallel support, the World Bank CAPE program will also initiate the design of Climate Change Budgeting Tagging and Expenditure Tracking Tool and support its implementation.

Current and future NDC engagements should seek to increase the Bank's strategic engagement, including the support to the NDC Partnership.<sup>7</sup> **Client engagement with countries has progressed in several countries through policy dialogue and linkages with investments.**

**The ACBP's Forward Look includes a new component under enabling resilience: Strategic Support for NDCs.** This will allow for continued and deepened strategic engagement, which will assist in mainstreaming and institutionalizing climate change and provide for opportunities for scaled-up investments within the Bank and client countries.

## Resilience Capacities after Three Years of Implementation

### Core Resilience Capacities and Pathways to Resilience

**Recognizing that climate drives many of the shocks and stresses that keep African households in poverty, the ACBP seeks to *strengthen resilience, power resilience, and enable resilience.*** In the context of climate change, *resilience* and *resilience-building* refer to heightened system capacities of natural, physical, and human systems to anticipate, respond to, and recover from climate-related hazards. Finer details on who or what is exposed to what kind of hazards alter the scale, nature, and timeframe of resilience-related interventions (e.g., protecting coastal cities from rapid onset and large impact events versus those supporting subsistence farmers during repeated, low-impact events, such as precipitation shortfalls).

**The ACBP resilience capacity analysis<sup>8</sup> assesses resilience-building pathways implemented or planned within ACBP projects as they build core resilience capacities<sup>9</sup>** (table 1.15). The analysis builds on work done in the Second Progress Report (World Bank 2017a), and delves deeper to understand these resilience-building pathways by assessing resilience attributes, as adapted from the World Bank Results Monitoring and Evaluation for Resilience-Building Operations Project (ReM&EP) and the Resilience Assessment Benchmarking and Impact Toolkit (RABIT), along with resilience capacities.<sup>10</sup>

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7 The NDC Partnership is a coalition of countries and institutions working to mobilize support and achieve ambitious climate goals while enhancing sustainable development. See the website, <http://ndcpartnership.org/>.

8 Using a framework developed through the World Bank ReM&E project.

9 According to OECD (2014), the three types of core resilience capacities include Absorptive Capacity, Adaptive Capacity, and Transformative Capacity.

10 For more details on the ReM&E framework, see the website <http://documents.worldbank.org/curated/en/692091513937457908/Operational-guidance-for-monitoring-and-evaluation-M-E-in-climate-and-disaster-resilience-building-operations>; for more details on RABIT see the website <http://www.niccd.org/resilience/>.



**Table 1.15:** Description of Core Resilience Capacities and Resilience Attributes

Core resilience capacities	Resilience attributes that support resilience-building pathways
<p><b>Absorptive capacity.</b> Ability of people, assets, and systems to prepare for, mitigate, or prevent negative impacts of hazards to preserve and restore essential basic structures and functions, e.g., strengthening walls of grain storage sheds so they can withstand inclement weather, such as high winds and rain.</p> <p><b>Adaptive capacity.</b> Ability of people, assets, and systems to adjust, modify, or change characteristics and actions to moderate potential future impacts from hazards so as to continue to function without major qualitative changes, e.g., establishing an irrigation system for farmers previously dependent on variable rainfall to water crops.</p> <p><b>Transformative capacity.</b> Ability to create a new system to avoid negative impacts from hazards, e.g., shifting from agriculture to another means of income, such as livestock herding, given the chronic climate and disaster risk and stress faced by the current system.</p>	<p><b>Preparedness.</b> Ability of the community or system to manage and cope with climate change/disasters.</p> <p><b>Robustness.</b> Ability of community or system to maintain its characteristics and performance in the face of, or withstand, climate change/disasters.</p> <p><b>Protection.</b> Extent to which community or system is protected against climate change or disasters.</p> <p><b>Recovery.</b> Ability of community or system to recover from climate/disaster emergencies.</p> <p><b>Rapidity.</b> Speed at which assets can be accessed or mobilized by community stakeholders or system to achieve goals efficiently.</p> <p><b>Diversity.</b> Ability of community or system to undertake different courses of actions with the resources at their disposal to mitigate risks.</p> <p><b>Redundancy.</b> Ability of community or system to withstand failure.</p> <p><b>Flexibility.</b> Ability of community or system to respond to uncertainty associated with climate change and disaster risk.</p> <p><b>Inclusion.</b> Extent to which the community or system provides equal access to rights, resources, and opportunities to its members.</p> <p><b>Integration/connectedness.</b> Degree to which resilience is integrated across the system.</p> <p><b>Learning.</b> Learning of the community or system to generate feedback with which to gain or create knowledge and strengthen resilience-relevant skills and capacities.</p>

**ACBP projects contribute toward resilience building via multiple pathways.** The core resilience capacities are enhanced through several resilience building attributes that may be realized through project activities or interventions. Resilience attributes can contribute to building adaptive, absorptive, or transformative capacities. Table 1.16 illustrates these resilience attributes in the context of ACBP project activities.

**Table 1.16:** Resilience Attributes Underpinning Core Resilience Capacities (Absorptive, Adaptive, and Transformative)

Resilience attributes	Sample activities from ACBP projects	Sample ACBP project
Robustness	Develop physical preparedness by rebuilding unpaved roads in rural areas for all-seasons	P160505: Rural Mobility and Connectivity Project
Learning	Capacity building of the health workforce through training, motivation, and retention to be better equipped for disease outbreaks	P159040: REDISSE 2
Preparedness	Develop early warning systems, emergency shelters, and evacuation routes Establish agrometeorological centers to improve drought and flood forecasts	P154784: KE-Climate Smart Agriculture Project
Protection	Put in place climate-resilient infrastructure to protect from recurrent damage caused by frequent floods and hurricanes	P154698: Sustainable Landscape Management

**Table 1.16:** Resilience Attributes Underpinning Core Resilience Capacities (Absorptive, Adaptive, and Transformative) *(continued)*

Resilience attributes	Sample activities from ACBP projects	Sample ACBP project
Recovery	Restore degraded catchments and water courses; and rehabilitation of similar existing infrastructure	P153349: E-National Ag. and Rural Inclusive Growth
Rapidity	Rapid reallocation of project proceeds in the event of future natural or humanmade disaster or crisis that has caused negative impacts	Many projects have this component
Diversity	Enhance alternative community livelihoods by improving economic opportunities and linking them with conservation of wildlife and landscapes negatively impacted by climate change	P150523: TZ-Resilient Natural Resource Management
Flexibility	Construct bus rapid transit (BRT) public transport that provides residents with quick access to basic infrastructure Budget and plan for contingencies to allow for action in the face of a disaster	P156186: Dakar BRT Pilot Project
Redundancy	Establish hydropower to serve as backup for power sites A road that serves as network redundancy in case a bridge crossing collapses in event of a disaster	P157733: CM-Hydro. Dev. on the Sanaga River TA Pr. P151026: Transport Sector Improvement Project
Inclusion <sup>a</sup>	Transform target group's (women's) social and livelihood outcomes by training them to prepare for climate impacts	P161364: WISE Nigeria
Integration/ connectedness	Support coordinated and integrated community-level surveillance systems and processes across the animal and human health sectors to monitor climate-exacerbated diseases	P161163: REDISSE III

Note: a. While elements of inclusion (access to rights, resources, and opportunities) may fall under other resilience concepts as well, inclusion is particularly important for Africa, and on occasion have been accounted for twice in the resilience analysis.

## Results of Resilience Capacities Analysis

**The resilience capacities analysis was applied to 57 ACBP approved projects, representing 32 percent of the ACBP portfolio to date.** This selection includes all projects that contribute to at least the top 90 percent climate CCA co-benefits for each ACBP component (see Appendix B for methodology).

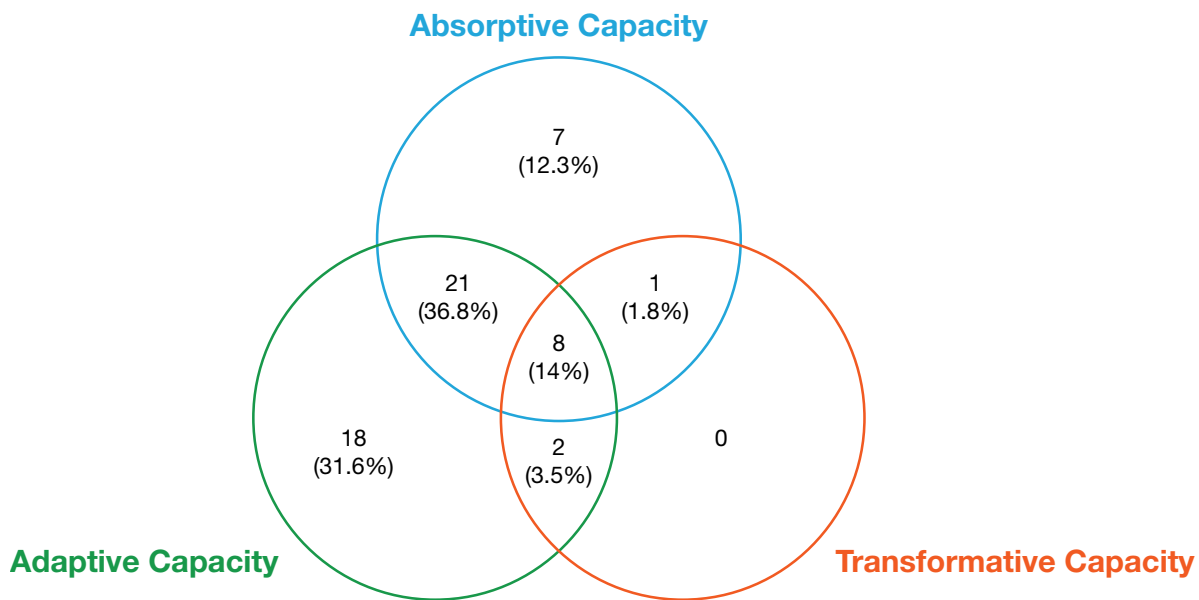
### Core Resilience Capacities

**An assessment for core resilience capacities shows that most ACBP projects augment more than one type of resilience capacity** (figure 1.10). Up to 86 percent (49) of the projects contribute to enhanced adaptive capacity, either solely, or alongside contributions to other core capacities. Many of these projects include a component for contingency emergency response, including budget provision or community-based early warning systems (such as in Madagascar's Sustainable Landscape Management Project and in the Burundi Landscape Restoration Project). Such components mean that projects are increasing the preparedness of the systems by planning for future disasters, as well as the flexibility of the system by having a backup budget, which increases overall adaptive capacity.



Cabo Verde, like all small island states and coastal nations in Africa, needs environmental and social protection from extreme shocks that are only worsening with climate change. (World Bank/Daniella Van Leggelo-Padilla)

Figure 1.10: ACBP Projects' Contribution to Building Absorptive, Adaptive, and Transformative Capacities



Source: World Bank.  
 Note: Total of 57 projects.

**Close to 65 percent (37) of the projects contribute to improvements in absorptive capacity, mostly through social safety nets via cash transfer programs, which enable them to withstand inclement weather, such as high winds and rain or crop failures.** An example of this is the Mali Drylands Development Project, which, among other activities, provides timely, predictable, and regular cash transfers to low-income households to allow them to minimize disaster impacts during recurring climate crises the country faces (such as drought, desertification, floods, or climate-induced disease outbreaks).





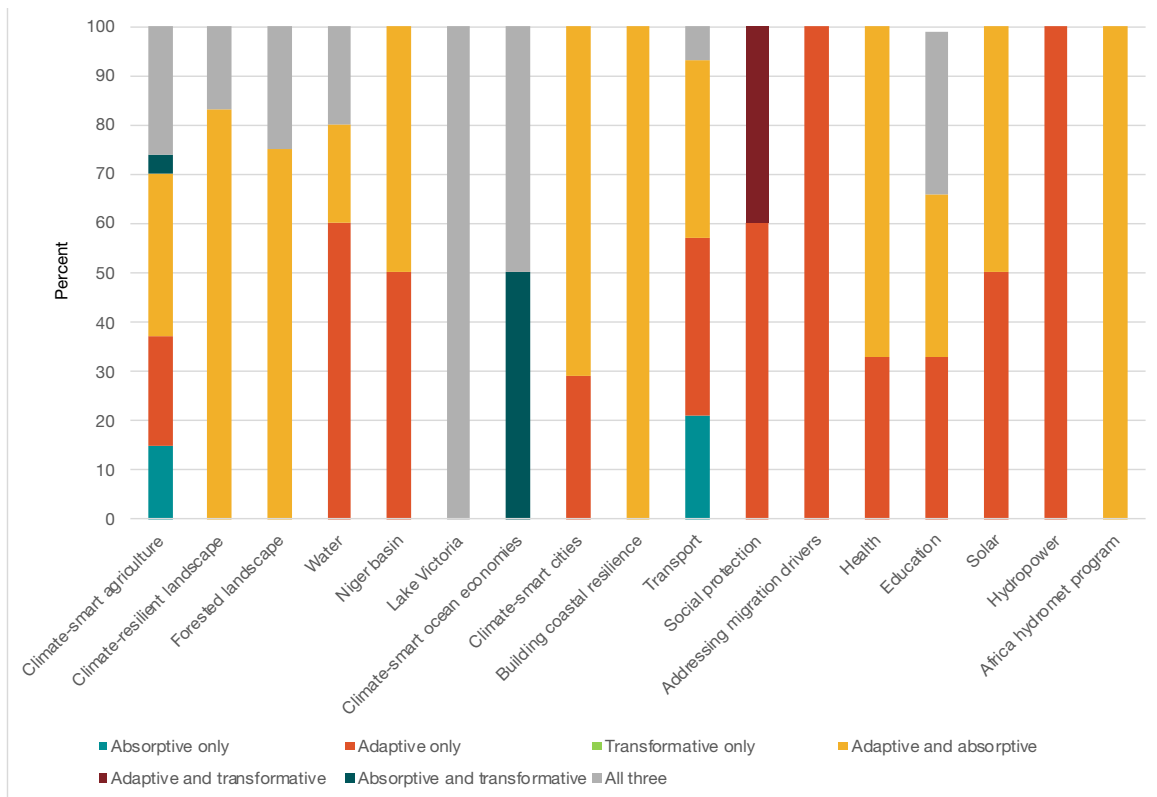
**Meanwhile, fewer than 20 percent (11) of the projects contribute to building transformative capacity.** This is not surprising because transformative capacity to secure more systemic shifts to address climate change is often premised on existing or enhanced adaptive and absorptive capacities, since these contribute to foundational skills and know-how. One example is Tanzania’s project on Resilient Natural Resource Management, which improves management of natural resources and tourism assets in priority areas of Southern Tanzania. It builds the three core capacities with activities, such as improved coastal and fishing infrastructure, to reduce climate impacts on coastal areas, new adaptation strategies for water management in the Usangu plains, and introduction of jobs that involve conservation of wildlife and natural resources. The project also introduces alternative livelihoods in sectors that are not affected by climate and weather impacts. These activities work together in bringing a systemic shift in the way resources are managed and conserved in Tanzania.

**The composite nature of capacity building is also evident when ACBP components were analyzed.** Figure 1.11 presents how each ACBP component contributes to building these core resilience capacities in various combinations. Adaptive capacity is the most prevalent across the portfolio, while absorptive capacity, by itself, is notable in CSA and Climate-Smart Transport projects, in which the vulnerability of the farmers and road access sometimes requires “fixes” to ensure that communities and beneficiaries can be buffered through climate-related hazards. Because of climate change impacts, transformative capacity is more common in ACBP components that relate to natural capital, including agriculture, landscapes, and seascapes, which have vulnerable ecosystems and livelihoods. One example is the Second South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFC) from the Climate-Smart Ocean Economies component, which promotes sustainable livelihoods through alternative and innovative fishing practices, pushing a systemic change in the fisheries industry.

**CSA possesses the most diverse set of projects in how they enhance resilience through different core capacity combinations** (figure 1.13). This can be explained by the significance of the agricultural sector in African economies, and the need for it to urgently develop resilience against climate change. Projects attempt to build resilience through multiple pathways, with a range of activities, such as introducing climate-resilient crops; developing innovative methods of irrigation; promoting conservation agriculture and agroforestry to diversify farms, improve food security, and capture carbon; and training farmers on alternative livelihoods that are less reliant on the weather.

Enhancing resilience through absorptive and adaptive capacities is seen in 12 of the 17 ACBP components (figure 1.11). For example, the Sustainable Landscape Management (SLM) project in Madagascar will build absorptive capacity by investing in climate-resilient infrastructure to protect farmlands and other assets from climate shocks such as floods and hurricanes. In addition, the project is building adaptive capacity through measures that minimize impacts of climate shocks and enhance the resilience of agroecosystems such as hillside stabilization through terracing, gully erosion control structures, rehabilitation of irrigation facilities, and restoration of forested landscapes.

**Figure 1.11:** Core Resilience Capacities of Individual ACBP Components



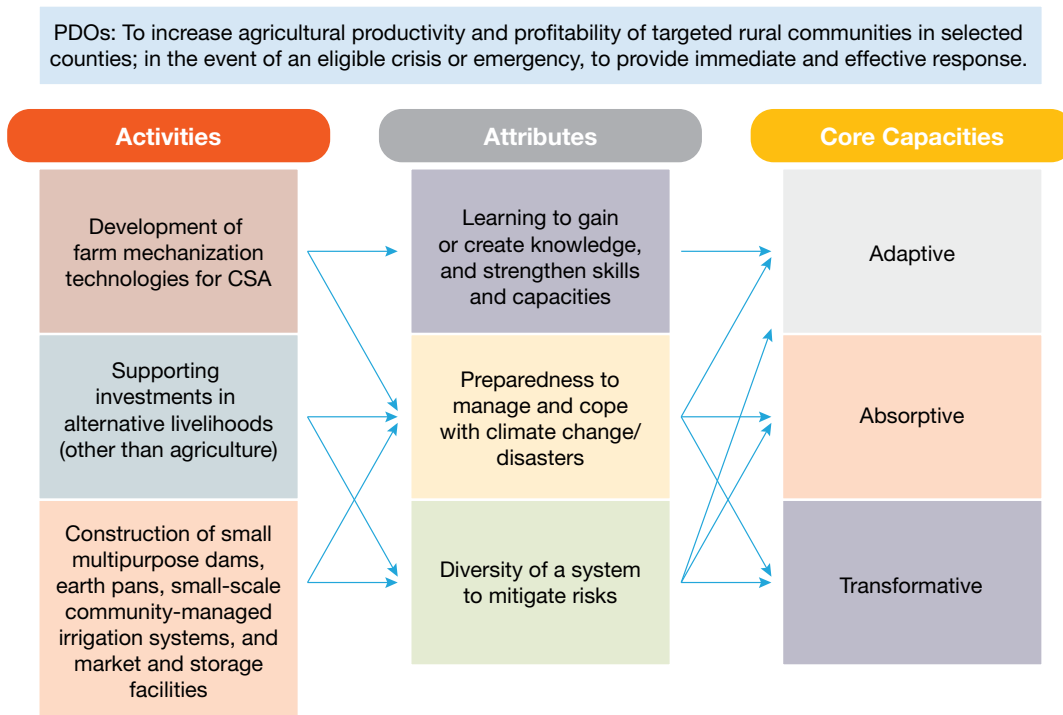
Source: World Bank.

## Resilience Pathways

**Design of good interventions and activities can bolster pathways to resilience attributes and capacities.** Multiple pathways can enhance core resilience capacities through activities that enhance and embed concrete resilience attributes in human, natural, or physical systems. This is illustrated here for three projects—on roads, agriculture, and health—from the ACBP portfolio with resilience pathways depicted in flow diagrams along with their project development objectives (PDOs).

**Case 1.** The National Agriculture and Rural Inclusive Growth (NARIG) project in Kenya includes activities such as the development of technologies for farmers to practice CSA (figure 1.12). This activity allows the system to **learn** and adopt improved agricultural practices to better **prepare** for the unpredictable climate and weather variability, enhancing its **adaptive capacity**. Another activity includes supporting investment in alternative livelihoods so that some members of communities can shift toward more stable and less weather-reliant sources of income. This allows them to **diversify** their sources of income and increase **preparedness** for climate shocks. This increases the system’s **absorptive capacity**, by reducing the impact of floods and droughts on the community’s source of income, as well as its **transformative capacity**, as parts of the system shift to other economic sectors. The project increases the system’s **adaptive capacity** by constructing dams and new irrigation systems. These activities allow the system to **diversify** its source of water, allowing it to be **better prepared** in case of droughts.

**Figure 1.12:** Kenya National Agriculture and Rural Inclusive Growth (P153349)—Resilience Pathways and Resilience Capacities

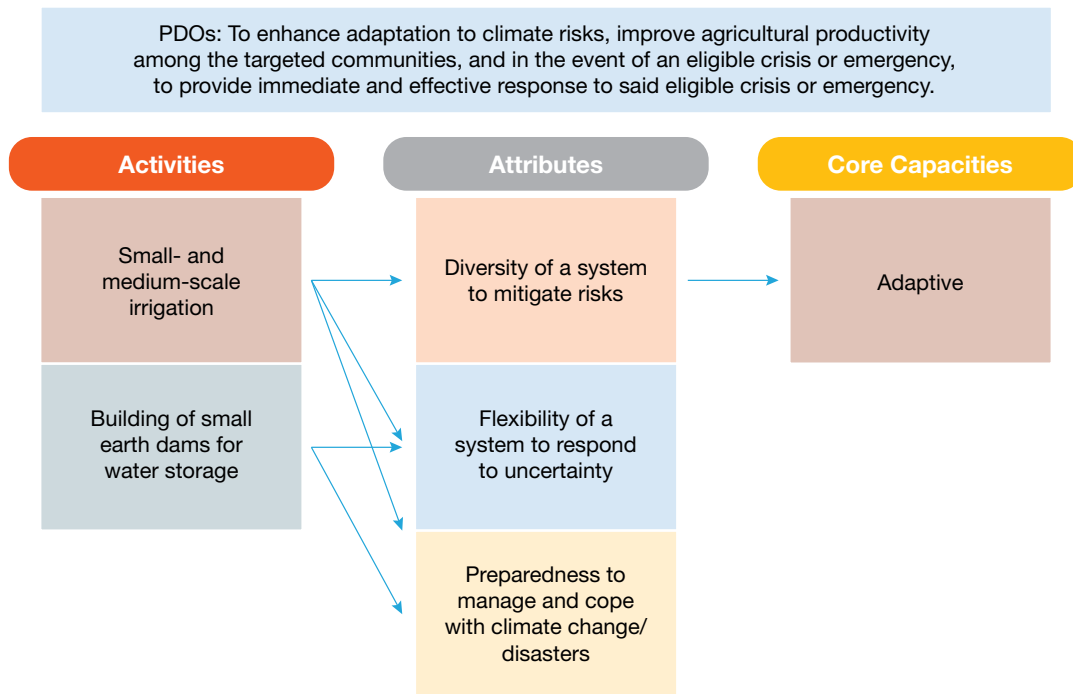


Source: World Bank.



**Case 2.** The Niger Climate-Smart Agriculture Support Project contributes to building resilience mainly through increasing the country’s **adaptive capacity** to respond to droughts (figure 1.13). Activities that support small- and medium-scale irrigation improve the **flexibility** of farmers who previously relied solely on rainfall, thus **diversifying** their sources of agricultural water. Farmers adopt new farming technologies through improved access to information from private and public institutions about innovative practices. Building of small earth dams for water storage improves communities’ **flexibility** because they can mobilize water in times of drought. These actions increase **preparedness** to manage droughts in the future. Enhancing these resilience attributes contributes to the **adaptive** capacity, because the project’s activities contribute to mitigating the potential impacts of droughts on the agricultural system.

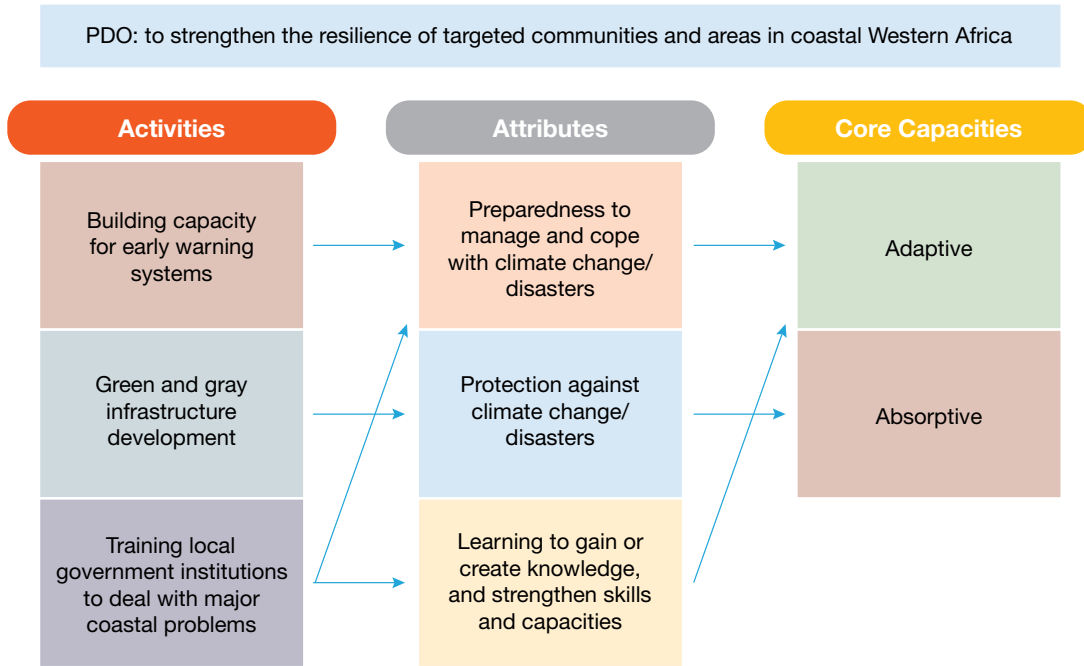
Figure 1.13: Niger CSA Support Project (P153420)—Resilience Pathways to Resilience Capacities



Source: World Bank.

**Case 3.** The WACA Resilience Investment Program (ResIP) enhances resilience pathways in West African countries (figure 1.14). Building and installing surveillance systems for flood warnings increases the **preparedness** of the countries to respond better to flood threats and increases their **adaptive capacity**. Investing in and building green and gray infrastructure allows urban areas to be **protected** against floods, which increases the system’s **absorptive capacity**. Training government officials and members of institutions supports **learning** to better **prepare** for coastal-related disasters, which increases the system’s **adaptive capacity**.

Figure 1.14: WACA ResIP (P162337)—Resilience Pathways to Resilience Capacities



Source: World Bank.

### Resilience Capacities by ACBP Component

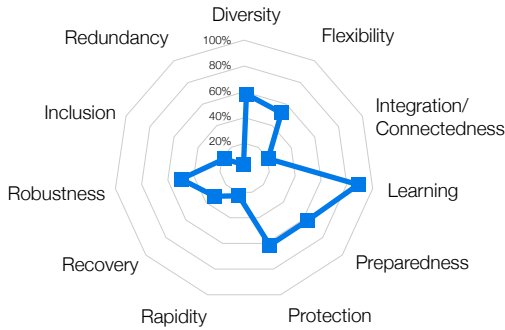
Radial graphs in figure 1.15, panels a–f, map the frequency of resilience attributes assessed in ACBP components with a sample size of five or more projects. The accompanying comments illustrate the themes and activities commonly found in these components.

**While the scope of projects increases the prominence of certain attributes, attention to these attributes could help enhance capacities across multiple resilience attributes and contribute to enhanced core resilience capacities.** Attributes such as preparedness (e.g., to cope and manage response to climate and disasters) scored beyond 40 percent across several ACBP components (CSA, resilient landscapes, water, transport, and cities), while social protection has a strong emphasis on recovery, focusing on the ability of the community or system to recover from climate or disaster emergencies. The theory of change that underpins resilience pathways illustrates how upstream climate screening can translate into increased resilience capacities through focused interventions and contribute to increased climate co-benefits.

**Figure 1.15:** How the Projects Assessed Under ACBP Components Contribute to Building Resilience through Attributes

**ACBP components mapped to resilience attributes    Comments**

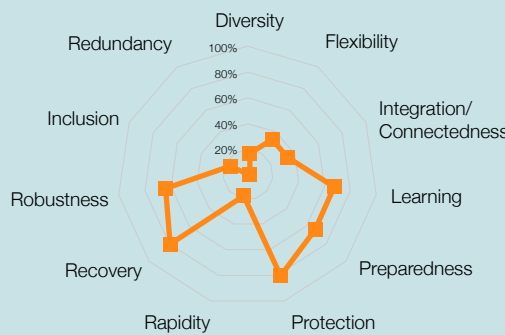
a. CSA



CSA (n=28)

Project objectives usually involve ensuring that the agriculture sector becomes climate-resilient. Most often, activities include introducing and learning about crop varieties that are climate-resilient, developing innovative irrigation schemes to prepare for droughts, and providing alternative livelihoods so that people diversify their means of income and rely less on weather-sensitive income generation. These examples contribute to building adaptive and transformative capacities.

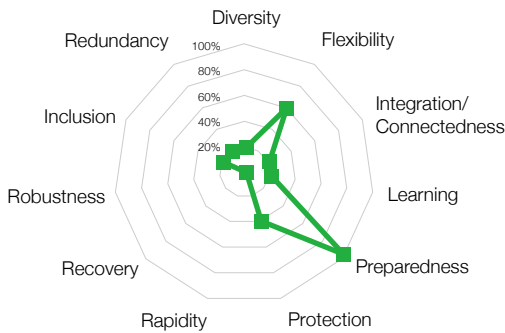
b. Climate-Resilient Landscape



Climate-Resilient Landscape (n=6)

Project objectives are often to either protect the landscape or recover from the impacts of climate change. These impacts often include coastal, soil, and land erosion due to frequent flooding, and they often affect coastal communities. Common activities involve watershed management and building and rehabilitation of flood banks to control flooding, thus strengthening absorptive capacities.

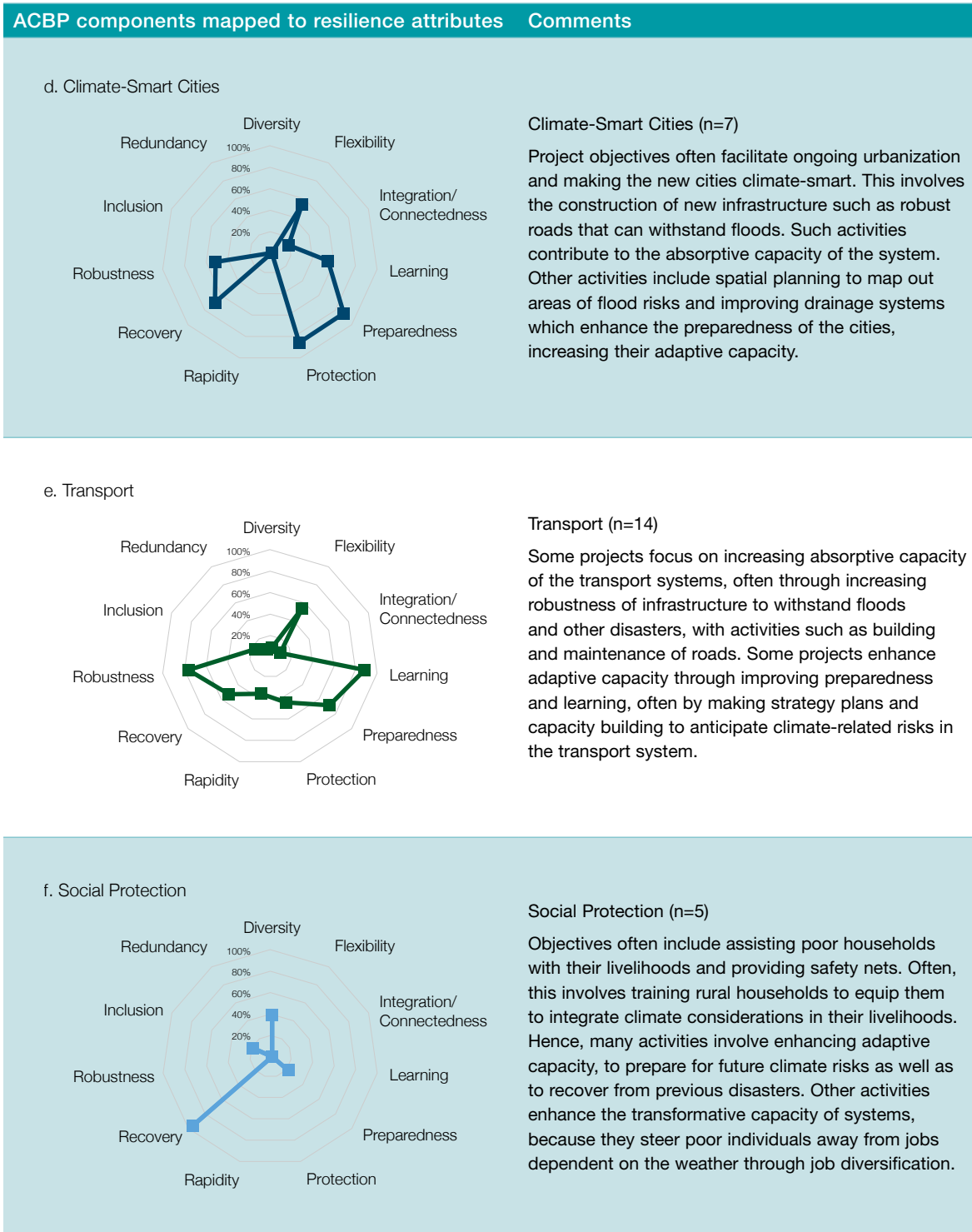
c. Water



Water (n=5)

Projects largely focus on improving access to all water and sanitation services. This often includes improving drainage systems in case of floods, as well as having sources of water in times of rain variability. Such activities lead to an increase in the preparedness and flexibility of the system, allowing them to adapt in times of floods and droughts.

**Figure 1.15:** How the Projects Assessed Under ACBP Components Contribute to Building Resilience through Attributes (*continued*)



Source: World Bank.



The ACBP focuses on women and to support their empowerment within households and at work. (World Bank)

## Gender Considerations in the ACBP Portfolio

Women and men face different vulnerabilities as well as opportunities from mitigation and adaptation responses to climate change impacts, and these provide entry points for projects to address climate risks in gender sensitive ways in their design and delivery. Gender integration is one of the corporate commitments of the Bank, with targeted outcomes set out in the Bank's *Gender Strategy FY16–23*, and the *WBG Gender and Climate Program FY18–23*, which supports implementation of both this strategy and the World Bank Group Climate Change Action Plan.



### *What Outcomes Do We Seek?*

ACBP projects are designed for positive gender impacts in a myriad of ways, from more targeted identification of beneficiaries to efforts at institutional change. Beneficiary identification can include enhanced specification of occupational groups and workers at different levels of the value chain (such as women forest users who can gain enhanced tenure security), including with nontimber forest products in landscape-based climate mitigation and adaptation efforts. Some examples include women who work in the value chain of Burkina Faso; women fish processors in coastal areas of West Africa; and women employed by the Seychelles processing plants. Most women work with the catch once landed; they face larger climate threats of warming ocean temperatures and changes in salinity and currents that affect their livelihoods.

Benefit mechanisms and channels for a gender-responsive approach to climate threats in diverse sectors include direct income and livelihood considerations for women and vulnerable men and efforts to shift institutional processes over time. Zambia yields important lessons on decentralized resilience planning under the Pilot Program for Climate Resilience (PPCR) investment. Such shifts in norms and practices enhance economic opportunity and improved climate resilience. Women also report a strengthened voice and agency at both individual and collective levels in client countries. See box 1.1.

#### **Box 1.1 Good Practice in Gender-Responsive Design in WACA**

Implementation lessons inform design and practice of inclusive and gender-responsive efforts in many regions. Experience in gender-responsive disaster risk reduction and preparedness measures with women participating in ex ante planning and subproject identification at the local level, and in national-level roles in risk reduction efforts, are part of WACA across six countries. The project uses a community-driven development (CDD) approach, participatory resilience building, and gender-responsive risk mapping across its large, transboundary project that links technical and socioeconomic interventions to reduce climate risk and enhance resilience of women and men. Project indicators include assessment of beneficiary satisfaction with project implementation, with ratings disaggregated by sex of respondents.





A boy plays in a rainstorm. Rain in Sub-Saharan Africa has already become less predictable, more variable, and extreme. (Ricardo Mayer/Shutterstock)

## Part II

# Progress on Existing ACBP Components and Introduction to New Components

This section provides a summary of progress for each existing ACBP component over the past three years (2016-2018) against the activities and targets set out at inception of the plan which was launched in December 2015. It introduces the new areas of focus, which will stimulate strategic shifts to deepen engagement and support scaled-up climate action. The new ACBP components include:

- Climate-Smart Health
- Climate-Smart Education
- Green Financial Systems, Financial Protection Instruments, and Green Competitiveness
- Strategic Support for NDCs
- Harnessing Satellite Technology for Climate Resilience

These new areas support the ACBP through strengthening resilience (Climate-Smart Health, Climate-Smart Education, especially in the context of human and social capital); and enabling resilience (by greening financial systems; harnessing technology to leapfrog on climate resilience; and systemic mainstreaming through NDCs).

## 2. Promoting Climate-Smart Agriculture

### Context

Agriculture is the driving engine for inclusive and economic development in Africa, absorbing up to two-thirds of the labor force and accounting on average for a third of gross domestic product (GDP) of countries (World Bank 2015a). Between 2010 and 2016, the number of undernourished people in Sub-Saharan Africa increased by 22.6 percent, with numbers increasing from 181 million to almost 222 million (FAO et al. 2018). Three factors have been cited as affecting recent trends in food security and nutrition, namely conflict, climate, and economic slowdowns (FAO et al. 2017). Agriculture is the most susceptible sector to the effects of climate change, particularly as a consequence of reduced yields and crop failure. If unaddressed, climate change will erode Africa's hard-earned development gains, endangering food security and poverty reduction achievements.

Agriculture contributes to climate change, accounting for a quarter of global anthropogenic greenhouse gas (GHG) emissions. Under current trends, agricultural practices are projected to account for up to 70 percent of total emissions by 2050 (WRI et al. 2015).

Adoption of climate-smart agriculture (CSA) policies, technologies, and practices—such as agroforestry, intercropping, improved nutrient management, and conservation agriculture—can reduce GHG emissions and the climate-induced stress on livestock and crops, enhance the nutrient quality of foods through diversification of crops, increase yields, and build agro-ecosystem resilience. Improved agricultural practices have the potential to generate multiplier effects that expand job opportunities in the downstream stages of the agri-food system and in the broader economy.

The agriculture component of the Africa Climate Business Plan (ACBP) aims to raise awareness and mobilize resources in support of CSA initiatives in Africa, promote adoption of evidence-based policies and institutional reinforcement for CSA, and support national and regional investment programs financially and technically to scale up CSA technologies. CSA policies and practices can benefit African countries by increasing productivity, enhancing resilience of farming systems, and lowering GHG emissions from the agricultural sector. Progress was made in several areas, as summarized in table 2.1.

Table 2.1: Progress of World Bank Support for CSA, FY16–18

Activity	Progress
<p>Engage in advocacy, awareness raising, and resource mobilization in support of key initiatives in the region:</p> <ul style="list-style-type: none"> <li>• Vision 25 × 25 in support of the Malabo Declaration on accelerated agricultural transformation</li> <li>• The Africa Climate-Smart Agriculture Alliance</li> <li>• West African CSA Alliance</li> <li>• Adoption of evidence-based policies and institutional strengthening for CSA</li> <li>• Financial and technical support for national and regional investment programs to scale up adoption of CSA technologies and management options</li> </ul>	<p>WBG Board approved 57 projects supporting CSA with cumulative commitments of US\$1.8 billion. These projects aim to improve the livelihoods of 6.6 million farmers and increase the climate resilience and productivity of more than 2.9 million ha of land.</p> <p>As part of IDA18 deliverables, CSIPs were prepared for five countries (Zambia, Mali, Côte d'Ivoire, Lesotho, and Zimbabwe) to identify and prioritize key policy actions, investments, and knowledge gaps, and to build client capacity to operationalize country climate commitments.</p> <p>CSA country profiles have been completed for Ethiopia, Kenya, Lesotho, Mozambique, Rwanda, Senegal, Tanzania, Uganda, Zambia, and Zimbabwe, and additional ones are under preparation for Benin, Burkina Faso, Côte d'Ivoire, Ghana, Malawi, Mali, and Niger. The profiles document a country's agricultural context, climate vulnerabilities, CSA adoption, and entry points for investing in CSA at scale.</p> <p>The WBG completed 11 analytical studies covering 25 countries in East and Southern Africa, on improving the resilience of agriculture and food systems to weather variability. The studies were supported by a US\$2.3 million grant from the Global Food Price Crisis Response Trust Fund. The studies will underpin future investments in scaling up CSA, in addition to supporting strategies for improving resilient outcomes among smallholder farmers.</p> <p>Continued leadership on knowledge and advocacy: (i) report Scaling up Climate e Agriculture through the Africa Climate Business Plan (World Bank 2018) (ii) establishment of Program for Climate-Smart Livestock under a WBG–Germany initiative to up-scale climate-smart livestock practices across the region; (iii) training workshop in Dar es Salaam to develop project implementers' capacity to integrate gender in CSA interventions; (iv) regional conference held on “Accelerating Transformation in Africa through Climate-Smart Agriculture” (Nairobi); and (v) Sixth African Green Revolution Forum was held.</p> <p>Regional workshop was held in Nairobi to establish the technical and institutional capacity of an early warning system to support food security in East and Southern Africa most affected by El Niño. The WBG delivered a strategic presentation on “Technologies for Agricultural Development and Climate-Smart Agriculture” at the Africa Caucus Meetings of Ministers of Finance.</p>

### Forward Look

Given the extreme vulnerability of African agriculture to climate change and variability, the Bank will step up resilience building to include more transformational responses to support deep, systemic, and sustainable change with the potential for large-scale impact across the region. There are two priority areas of engagement.

**Addressing gaps in technical assistance (TA) and capacity development for transformative CSA scale-up.** There remains a substantial TA gap in some countries for scaled-up CSA programs that attract direct co-financing from governments, development agencies, and the private sector. Five areas of focus have been identified: (i) develop CSA country profiles to identify entry points for investing in CSA at scale in countries where this work has not yet been commissioned; (ii) develop CSA investment plans for prioritizing CSA strategies, policies, and investments; (iii) strengthen measuring, reporting, and verification (MRV) systems for Nationally Determined Contributions (NDCs); (iv) build capacity to access climate finance; and (v) promote knowledge sharing, learning, and capacity enhancement for CSA policies, technologies, and practices.

**Accelerate the scaling up of CSA technologies and practices.** There is a need for scaling up and replicating effective approaches and innovations to deliver productivity and climate benefits. Existing and pipeline regional projects could be highly instrumental for such scaling up. Useful criteria, such as the number of rural poor households, poverty rates, and prevalence of undernourishment, could help identify countries currently underrepresented in the CSA portfolio but for which the potential for accelerating agricultural transformation is huge. Technology selection and prioritization for the countries will be informed by geospatial capabilities of the Ag Observatory, CSA Country Profile, Investment Plan, and other TA outputs for the countries.

### Resource Mobilization

- International Development Association (IDA) and total targets under ACBP have exceeded set goals.
- International Bank for Reconstruction and Development (IBRD) has been leveraged.
- Good pipeline.
- Continued need for resource mobilization for Forward Look.

Collaborating with partners, the Bank seeks to facilitate the adoption of CSA by 25 million farmers, the establishment of CSA on 3 million hectares of farmland, the creation of improved pastoral systems in at least 15 countries, and improved capacity to implement CSA policies in at least 20 countries in Africa by 2026.

As part of resources mobilization, a Program for Climate-Smart Livestock (PCSL) has recently been established through a joint initiative involving the German Development Agency (GIZ), the World Bank, and the International Livestock Research Institute (ILRI). The program aims to complement the expanding investments in improved livestock production by fostering climate-smart livestock management practices, monitoring systems and policies across African countries, and providing guidance for scaling up lessons learned across the continent. The Program will intervene at several spatial scales and engage with various stakeholder groups in five fields of activity: (i) expanding action strategies for climate-smart livestock systems; (ii) incorporating climate change mitigation and adaptation in livestock-related policies; (iii) improving reporting on NDCs; (iv) up-scaling interventions from climate change mitigation and adaptation in livestock at the regional level; and (v) incorporating lessons learned by the Program into international discussion on agriculture and climate change. The program will further help improve production practices in the evolving livestock portfolio.

Following the 2015–16 El Niño, the World Bank leveraged funds from the Global Food Price Crisis Response Trust Fund to conduct analytical studies covering 25 countries in East and Southern Africa, on enhancing climate and disaster risks preparedness and response, and improving the resilience of agriculture and food systems to weather variability. The studies will underpin future investments in scaling up CSA, in addition to supporting strategies for improving resilient outcomes among smallholder farmers.

### **Box 2.1: Success Story of Côte d'Ivoire Cashew Value Chain Competitiveness Project**

The Cashew Value Chain Competitiveness Project aims to increase cashew productivity, quality, and added value, benefiting smallholder farmers and the cashew processing industry in Côte d'Ivoire. The project is financed by an IBRD loan of US\$200 million, and counterpart funding of US\$85.25 million.

The project is an innovative mix of interventions including productivity enhancement and access of farmers to markets; development of cashew processing and storage infrastructure to meet export standards, farmers' access to investment capital and risk management solutions and improving the regulatory framework for private sector participation. The project's primary beneficiaries are smallholders with farms of 2–3 hectares in the poorer northern half of the country. About 225,000 cashew farmers are expected to benefit directly from project interventions. Other important project beneficiaries are cashew processors and traders, and rural youths through direct employment in the cashew value chain.

The project generates substantial mitigation benefits. Ex ante analyses reveal that climate-smart interventions constitute a carbon sink of 10.2 million carbon dioxide equivalents (CO<sub>2</sub>e) over a 20-year period, corresponding to 510,568 tons CO<sub>2</sub>e per year, or about 0.72 tons CO<sub>2</sub>e per hectares a year.

*Note:* For additional information, see the World Bank website <https://www.worldbank.org/en/news/loans-credits/2018/04/10/cote-divoire-cashew-value-chain-competitiveness-project>

There has been progress on the adoption of promising CSA technologies in client countries. Countries adopt a range of context-specific, climate-smart technologies and practices to meet their climate change and food security goals. The CSA portfolio review indicates that improved livestock production is the most prevalent in 63 percent of the CSA project's portfolio, followed by improved water management (57 percent), conservation agriculture (53 percent), agroforestry (47 percent), and digital agriculture (39 percent). The adoption of digital agriculture is gaining momentum. The application of digital technology in the design and delivery of integrated weather and market advisories using big data analytics is increasingly helping countries to identify conditions that may endanger food security and inform farmers' decisions to adequately respond to, and when possible, capitalize on the changing conditions.

The World Bank is leveraging the big data and geospatial capabilities of the Agricultural Intelligence Observatory of its Agriculture Global Practice in targeting climate-smart interventions in existing and pipeline projects. The Ag Observatory comprises high-resolution agrometeorological data for both analytical and operational programs. It integrates public domain agriculture monitoring databases with private sector, open access, high resolution (9 kilometer by 9 kilometer), weather data with local crop calendars, and crop models. The integrated platform delivers agriculturally relevant information based on more than 1.5 million "virtual weather stations" distributed across the earth's agricultural land and updated four times daily. The Ag Observatory and component data platforms will assist African countries in promptly detecting early warning of farming system shocks, undertake famine threshold analyses, and initiate proactive adaptation response measures. Discussions are underway to leverage the Ag Observatory in Kenya, Ethiopia, Lesotho, Uganda, Zambia, and Zimbabwe.

## Lessons Learned

The adoption of CSA practices can face a variety of socioeconomic and institutional barriers. These may include the need for significant upfront expenditures on the part of poorer farmers, lack of information about the potential of improved techniques, and often limited capacity to implement the techniques. The World Bank assists country clients in overcoming the adoption constraints by providing support for specific material inputs, TA for design and delivery of critical interventions, such as biogas energy development, enhancing private sector participation in agricultural markets, promoting agricultural value chains, and training and skills development for knowledge-intensive technologies.

During 2015–16, record-high temperatures, droughts, and floods resulting from one of the strongest El Niño events in recent decades adversely impacted agricultural production across East and Southern Africa. The El Niño event was the worst in 15 years; it was associated with massive crop failures in Southern Africa, floods in parts of East Africa, little or no harvests in many areas, and an extensive food security crisis. Increasing levels of concern over the mounting crisis prompted the World Bank to support countries' responses to the crisis and document lessons from the experience. Important lessons include the need to improve food security risk management by implementing a comprehensive food security risk assessment,



reviewing contingency plans, and strengthening food security monitoring and early warning systems; reviewing policies and strengthening institutions responsible for food security risk management; and strengthening the national scalability of social protection safety net programs to more quickly reach the most vulnerable and affected populations.

There is a need to step up and strengthen client engagement on policies that promote adaptation and resilience to climate shocks by mainstreaming resilience into agriculture sector policies, incentives, and investments. There is an opportunity to support more transformational responses to adaptation and resilience of the food system to climate change. A review of the CSA portfolio finds that developing adaptive capacity, defined as the ability of a system to adjust, modify, or change characteristics and actions to moderate potential future impacts from hazards through incremental changes, is the primary focus of resilience building of the CSA project activities (58 percent). Boosting absorptive capacity, the ability of a system to prepare for, mitigate, or prevent negative impacts of hazards, is addressed by 26 percent of project activities, whereas increasing transformative capacity, the ability to create a fundamentally new system to avoid negative impacts from hazards, is the focus of 16 percent of activities.

More needs to be done in mobilizing private sector financing for CSA. The World Bank is addressing this through efforts to engage private investors in agricultural value chains and food systems through the Maximizing Finance in Development (MFD) approach. The MFD approach is rooted in the Addis Ababa Agenda for Action, which is mobilizing additional resources to achieve ambitious development goals. The approach deploys concessional funds strategically to crowd in financing sources, noting that while the largest supply of development resources remains domestic public spending, the greatest potential for expansion lies with private finance and the engagement of business in the development process. The MFD addresses the policy distortions and lack of conducive enabling environment that hinder private sector responses in agricultural development.

The World Bank works with country clients to ensure a more coordinated approach to capacity building through strengthening agricultural education, science, and technology. Given the intensity, frequency, and pace of projected climate change and the extreme vulnerability of African agriculture, the World Bank will step up resilience building to include more transformational responses to support deep, systemic, and sustainable change with the potential for large-scale impact across Africa. Four strategic lines of action have been identified, as reflected under the Forward Look (chapter 18, box 18.2).



Wheat fields are irrigated at Huntley Farms in Zambia, where climate-smart agriculture has been prioritized by the government. (World Bank)

### 3. Creating Climate-Resilient Landscapes

The resilient landscapes approach contributes to the restoration agenda focused on forests and drylands. Both are discussed in this chapter.

#### Context — Forested Landscapes

The World Bank’s Africa Forest Landscapes Program addresses deforestation and forest degradation, the second-leading anthropogenic cause of global warming. The livelihoods of 400 million people in Africa depend on forest resources, highlighting the significance of forest loss as a development issue. The program promotes sustainable forest management to mitigate climate change, transform the livelihoods of forest-dependent people, and supports vital ecosystem services. Its integrated approach fosters stakeholder planning for sustainable development across sectors. Progress was made in several areas, as summarized in table 3.1.

**Table 3.1:** Implementation Progress that Supports Forests and Reduced Emissions from Deforestation and Forest Degradation, FY16–FY18

Activity	Progress
<ul style="list-style-type: none"> <li>Support development of national REDD+ strategies and implementation arrangements (e.g., legal framework, capacity building, governance structures, monitoring and verification systems, stakeholder engagements platforms, feedback and grievance redress mechanisms)</li> <li>Fund early investments in demonstration activities in forest landscapes</li> <li>Fund performance-based payments for REDD+ and enhanced carbon stocks</li> </ul>	<p>Africa’s forest program is the most active at the Bank and covers multiple country programs; it harnesses a range of instruments and financing to advance the agenda:</p> <p><b>The Africa Forest Landscapes Program has 17 active country programs;</b> funding focused on scaling up efforts in several countries to improve forest sector planning and governance, piloting forest investments to address deforestation and forest degradation, and promoting sustainable forest management. This includes funding (readiness/preparatory, investments, and performance-based) from the BioCarbon Fund’s ISFL, the FCPF, REDD+ Readiness Fund, Carbon Fund, and FIP.</p> <p><b>About US\$101 million committed from the FCPF to 15 countries</b> to support the development of national REDD+ strategies and implementation arrangements. Seven country programs (Congo, Dem. Rep., Ethiopia, Liberia, Ghana, Madagascar, Mozambique, and Congo, Rep.) are well advanced and have received endorsement from the FCPF on the implementation arrangements developed for REDD+.</p> <p><b>Over US\$30 million has been allocated from the CAFI</b> to four countries (Cameroon, the Central African Republic, Congo, Dem. Rep., and Congo, Rep.) for the development and implementation of national investment frameworks for REDD+, with the WBG as an implementing partner.</p> <p><b>10 countries are preparing large-scale programs for performance-based payments for REDD+ and enhanced carbon stocks.</b> Carbon accumulation rates in biomass and soil increased by 20 million tCO<sub>2</sub>e over baseline: in 2018 around 8.8 million incremental carbon dioxide equivalent was accumulated. Five countries (Congo, Dem. Rep., Ghana, Madagascar, Mozambique, and Congo, Rep.) have been accepted or provisionally accepted into the FCPF Carbon Fund. Two countries are in the FCPF Carbon Fund pipeline (Cameroon and Côte d’Ivoire), while two are in the ISFL pipeline (Ethiopia and Zambia). Liberia has potential bilateral support from Norway to develop such a program. One country (Congo, Dem. Rep.) is implementing its REDD+ performance-based program, following the signature of an ERPA with the FCPF Carbon Fund.</p> <p><b>11 countries in the region are benefitting from FIP support.</b> FIP is financing investment projects in six countries (Burkina Faso, Congo, Dem. Rep., Ghana, Ivory Coast, Mozambique, and Congo, Rep.) with a total of US\$155 million, with the WBG as an implementing partner. All projects are under implementation, except for the project in the Congo, Rep., under preparation. In Ghana, around 85,000 ha are under climate-smart cocoa management practices or community resource management area, and 52,000 people of which half are women, benefitted from forests, and 50,000 forest users trained.</p> <p>FIP is supporting four countries (Cameroon, Rwanda, Uganda, and Zambia) with US\$250,000 each to develop an investment plan (with the understanding that there are currently no resources available for their implementation).</p>

### Forward Look

**Harness and leverage financing to continue to deepen engagement and sustain commitment and momentum,** building on readiness aspects (reducing emissions from deforestation and forest degradation [REDD+] readiness, Forest Carbon Partnership Facility [FCPF] readiness) and support to investment plans (e.g., Forest Investment Program [FIP]). This includes (i) additional African countries expected to receive endorsement from the FCPF on their implementation arrangements for REDD+ next year (Burkina Faso, Nigeria) and Togo by 2020. African countries are expected to start the implementation of large-scale REDD+ performance-based programs following acceptance into the FCPF Carbon Fund portfolio and signing of the first Emission Reductions Payment Agreement (ERPA) which will unlock the first results-based payments (Democratic Republic of Congo, Ghana, Mozambique, Madagascar, and the Republic of Congo expected to complete full-scale implementation roll out of programs and receive the first installments of performance-based payments by 2020/21). Côte d’Ivoire will present its performance-based program for consideration to Carbon Fund. Others, such as Uganda, will pursue Emission Reduction Program development with support from additional financing. The four FIP countries that have prepared their investment plans (Cameroon, Rwanda, Uganda, and Zambia) need investment resources to be able to implement their FIP plans.

**Engaging the private sector.** As the convening of stakeholders has gained momentum, there is enhanced interest and more proactive engagement from the private sector to partner in these programs, particularly around commodities supply chains. An example is cocoa, which is being explored in Ghana and Ivory Coast. Other commodities are being looked into in different jurisdictions (such as Zambia, where scoping for possibilities on cotton and macadamia are in progress).

**The World Bank’s Forest Action Plan,** adopted in 2016, provides a guiding framework, and the mid-term review currently underway is looking at the Bank’s overall progress (FY16–18) with a focus on sustainable forestry, forest-smart interventions (in nonforest sectors), climate change and resilience, rights and participation, and institutions and governance, including gender and biodiversity aspects. It will provide useful recommendations based on lessons to guide future directions.

### Resource Mobilization

- IDA target for Climate-Resilient Landscapes (Drylands) have exceeded set goals.
- IBRD has been leveraged.
- Need for continued resource mobilization for Forward Look.

## Lessons Learned — Forested Landscapes

Projects in the region have been transformational and innovative. For example, the FIP in Mozambique has a strong focus on forest governance by promoting land tenure reform and community land use planning. It was able to leverage substantial co-financing from the International Development Association (IDA)/Multi-Donor Trust Fund (MDTF) by linking forest governance and poverty reduction as a central objective of the FIP. Burkina Faso included law enforcement as a key component of the FIP by bringing community members together in consultations to express their opinions on natural resource management. Burkina Faso has benefitted from the use of technology to empower local actors to identify local challenges and create collaborative solutions.

Private sector engagement has been more successful in some countries, and more challenging for others. In Ghana, a reforestation company in partnership with the African Development Bank (AfDB) aimed to catalyze further private sector involvement in large-scale sustainable and commercial teak plantations in degraded forest reserves by expanding an existing forest plantation. The Democratic Republic of Congo has also benefitted from private sector involvement in its investment plan preparation process.

The preparation of jurisdictional-scale, performance-based programs for REDD+ has proven to be a complex task that takes time. See box 3.1 for an example. Areas of attention included convening and reaching agreement with stakeholders to implement these programs, as well as strengthening capacity on the technical aspects of the performance-based model. Because several countries are concluding this preparation phase, the experience can be capitalized to expedite preparation of such programs.

### Box 3.1 Madagascar Readiness for REDD+

Madagascar has signed an ERPA for a large-scale performance-based REDD+ program. As such, it has brought together nongovernmental organizations (NGOs), university and research teams, and government ministries to make an inclusive and nationally-owned forest monitoring system. As Madagascar prepares to implement REDD+, its capacity for remote sensing and analysis is an exemplary story of growing national capacity and collaboration. Historically, nongovernmental entities had the main capacity to produce Land Use/Land Cover geospatial information and conducting natural resource assessments. Through the support of the FCPF, the country has established a geomatics laboratory and forest monitoring unit to create government-owned Land Use/Land Cover data and to complete nationally designed and implemented forest inventories. The lab and forest monitoring unit are a center of excellence to train and build capacity from agencies around the government with the support of the FCPF and international experts. The unit also builds robust national datasets to produce, for example, the baseline for the performance-based REDD+ program.

## Context — Drylands Focus

The Bank continues to support the African Resilient Landscape Initiative through country- and regional-level projects. It is mobilizing financial and technical resources from multiple sources to help design and implement country- and region-specific integrated landscape-level strategies. The Bank is supporting resilient landscapes in the Sahel, the Horn of Africa, and East and Southern Africa by combining geographical and socioeconomic approaches to managing land, water, and forest resources in support of food security and inclusive green growth. Connecting types of land uses (including woodlands, agro-silvo-pastoral lands, croplands, rangelands, and irrigated agricultural lands) promotes productivity, resilience, carbon sequestration, biodiversity, water regulation and quality, national security, and regional stability. Progress has been made in several areas, as summarized in table 3.2.

**Table 3.2:** Progress of World Bank Support for Climate-Resilient Landscapes, FY16–FY18

Activity	Progress
<p>Preparation and implementation:</p> <ul style="list-style-type: none"> <li>• Resilient Landscapes for Development Program in Eastern Africa and the Horn of Africa (Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda)</li> <li>• Sustainable Agricultural Land Program in Madagascar</li> <li>• Agriculture and Natural Resources Landscape Management Program in Mozambique</li> <li>• Resilient Natural Resource Management for Growth Program in Tanzania</li> <li>• Transforming Landscapes for Resilience and Development in Zambia</li> </ul>	<p>Overall, the portfolio has made good progress and is on track in key landscapes through on-the-ground landscape management as well as institutional, policy, and targeted capacity building.</p> <hr/> <p>In the <b>Ethiopia</b> Sustainable Landscape Management Program, the land areas with sustainable landscape management practices are 807,300 ha and 8.8 million incremental carbon dioxide equivalent accumulated; more than 400,000 households involved.</p> <hr/> <p>In <b>Sudan</b>, more than 100,000 ha of land are under sustainable landscape management practices; and more than 15,000 hectares are brought under enhanced biodiversity protection.</p> <hr/> <p>The WBG has recently approved additional bilateral operations with Burundi, Ethiopia, and Sudan. In <b>Ethiopia</b>, a project to improve livelihoods, climate resilience, carbon storage, and land productivity in vulnerable rural major watersheds, is funded by US\$100 million from IDA and other sources. In <b>Burundi</b>, the US\$30 million project will support landscape restoration and resilience in two provinces (IDA). In <b>Sudan</b>, a US\$7.31 million proposal has been approved by the GEF.</p> <hr/> <p>Targeted institutions have benefited from training and capacity building activities to address risks and response to climate variability.</p> <hr/> <p>Carbon accumulation rates in biomass and soil increased by 20 million tCO<sub>2</sub>e over baseline: in 2018 around 8.8 million incremental carbon dioxide equivalent was accumulated.</p> <hr/> <p>Intervention on institutional, policy, information took place in Burundi, Congo, Dem. Rep., Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Mozambique, Somalia, South Sudan, Sudan, and Uganda.</p>
<b>Forward Look</b>	

In addition to addressing climate change and biodiversity loss, restoration of drylands generates positive socioeconomic impacts. Resource mobilization is key, coupled with scale-up and extending the geographic reach. Changes in vegetation cover will affect 100 million hectares by 2030, of which 100,000 hectares will be restored in Burundi through the Burundi Landscape Restoration and Resilient Project (P160613). Robust pipeline focusing on refugee issues (Kenya, Northern Uganda).

Table 3.2: Progress of World Bank Support for Climate-Resilient Landscapes, FY16–FY18 (continued)

### Resource Mobilization

- IDA target for Climate-Resilient Landscapes (Forests) have exceeded set goals.
- Need for continued resource mobilization for pipeline.
- Current pipeline:
  - » A US\$12.8 million project in Ghana, funded by the Global Environment Facility (GEF), is under implementation, with a potential for further scale-up.
  - » A project in Madagascar is under implementation, funded by US\$78.6 million from IDA and the GEF and €25 million in joint co-financing from the African Development Bank (AfDB).
  - » A US\$40 million project in Mozambique is under implementation, funded by IDA (see box 3.2).
  - » A US\$150 million project in Tanzania is under implementation, funded by IDA.
  - » A US\$33 million integrated forest landscape project for Zambia has started implementation, funded by IDA and the GEF.

### Future Opportunities

Several new operations should be ready for approval in 2019. The landscape restoration project in Burundi could obtain additional financing from the GEF and hence cover additional landscapes. In Malawi an operation for transforming the Shire Valley (building on an earlier operation in the Shire Basin) is at advanced preparation stage. Operations under preparation include projects in Burkina Faso, The Gambia, Guinea Bissau, Nigeria, and Senegal. Similar opportunities are likely to emerge from bilateral exchanges in the upcoming months.

Several broader opportunities are at the exploratory stage. The first is to respond to the Declaration made by African Ministers for the Environment participating in a forum in Niamey, Niger, in March 2018: they have called for the preparation of a large-scale program for resilient landscapes in Africa, building on public funding sources—including the Green Climate Fund (GCF), IDA, and GEF—as well as private sector financing. Other opportunities may include the scale-up of the Sahel and West Africa Program (SAWAP) in support of the Great Green Wall Initiative, which is at the advanced implementation stage in 12 countries. Another is crafting investment plans by countries based on their commitments under the Africa Forest Landscape Initiative (AFR100), the Bonn Challenge, and the Land Degradation Neutrality target setting process.



### Box 3.2 Supporting Integrated Landscapes in Mozambique

Mozambique's Integrated Landscape Management Portfolio (ILM) brings together several projects (P160033, P149620, P161241, P131965, P164524) to improve livelihoods and management of renewable natural resources by some of the country's most vulnerable rural communities. The central focus of engagement with the Government of Mozambique is sustainable rural development, embodying the programmatic approach and responding to a topic central to the national agenda. The Bank's support is integrated with the government's strategic priorities, and investments are mainstreamed into their programs. This portfolio maximizes finance for development through mobilizing commercial resources for agriculture and forest value chains, leveraging private equity for protected area management, and promoting partnerships between the private sector and communities. Client orientation is at the heart of the portfolio's approach, resulting in strong relationships with the government.

A best practice is creating linkages in activities between the private sector and local communities. Engaging with the private sector can reduce the dependence of community initiatives on donor finance and embed rural populations in systems that can be sustained over the long term. The project therefore promotes these partnerships, which would allow local communities to capture the project's economic opportunities. These entrepreneurial programs include the planted forest grant scheme, agroforestry systems with some market orientation, community forest concessions, and smallholder charcoal production.

Another good practice is engaging in a real-time policy dialogue at the national level. Through MozFIP, the World Bank has closely accompanied and supported reforms in the forest sector, engaging in policy dialogue, including just-in-time technical advice on measures.

For additional information, see the World Bank website, <http://www.worldbank.org/en/programs/mozambiques-integrated-forest-and-landscape-management-portfolio>.

## Reflections and Future Opportunities

Sustainable management of dryland landscapes is critically important and requires sustained financing, targeted technical assistance (TA) support, and regional scale to generate impacts. Combining sources of financing (TA, investment project financing [IPF], results-based finance) enables cross-sectoral coordination, strengthens national capacity, and delivers results extending far beyond the immediate projects. More financing is needed to continue implementing the agenda:

- Increase access to rural finance to small and medium landholders to adopt new land use practices, including conservation agriculture, agroforestry, and commercial plantations.
- Provide additional financing to law enforcement to address illegal logging and poaching.
- Test additional innovative mechanisms to crowd-in private investment, particularly to link medium-sized businesses to international venture capital (equity or loans), and to promote outgrower schemes.
- Ensure financial sustainability of protected areas.

With TA, policies and technology, the following is needed:

- Technical assistance to countries, both at national and decentralized levels.
- Support to geographic information system (GIS)-based solutions for landscape planning and monitoring.
- Work on strengthening rights of local communities to land and natural resources.
- New technologies for tree planting

To expand geographic reach, the following is needed:

- Regional program around the Zambezi watershed.
- Southern Africa landscape restoration, including addressing water stress (Great Green Wall).

## 4. Promoting Integrated Watershed Management

### Context

An emphasis on landscapes and integrated watershed management is critical for building resilience across the Africa Region. Water is the primary channel through which the impacts of climate change are experienced. Managing climate vulnerabilities along the hydrologic cycle and hydrographic boundaries is a logical approach to building resilience, and it can help avoid maladaptation. This point is highlighted through “Climate Resilience in Africa: The Role of Cooperation around Transboundary Waters” (World Bank 2017b).

The Africa Climate Business Plan (ACBP) has laid out ambitious investment goals for strategic river basins across the Africa Region (Niger River Basin, Lake Victoria, Lake Chad, and Zambezi River Basin). However, the original focus on these water bodies and river basins is missing the broad range of ways in which water is critical to advancing the climate change agenda throughout the region. Taking our FY18 Water GP portfolio as an example, there are hundreds of millions of dollars tagged as “climate co-benefits” that do not have an obvious way of being accounted for in the ACBP. This includes projects in the water supply and sanitation sector, dams, and water resources management projects that oftentimes fall outside of the basins already captured in the ACBP.

Still, the thinking continues to evolve on how best the clients on this agenda can be supported, and as such, there have been innovative approaches piloted this past year that seek to deepen or broaden our engagement on the climate agenda in Africa, such as new strategic planning and analytical approaches, methodologies and tools, and lending instruments. Efforts to increase resilience in Africa through improved groundwater management, agricultural water stewardship, and integrated urban water management, which when combined, can help connect water resources management, utilities, and irrigation to these and other river basins throughout the region.

**Strategic planning to systematically frame lending focused on climate resilience** to push institutional thinking on investment planning at the river-basin scale. In addition to the Niger Climate Resilience Investment Plan (CRIP) process initiated around the launch of the ACBP this year similar work using a climate resilient lens has been initiated in Tanzania, that will frame investment options to identify a suite of climate-resilient investments that cut across the portfolio. This effort in Tanzania could be a model for how business is conducted in other countries across the region. Several strategic pieces on groundwater were completed, including work in Somalia and the Horn of Africa (the Sahel Irrigation Initiative Support Project [SIIP]) and the Africa Groundwater Initiative. Analysis concludes that groundwater presents tremendous potential for countries in hedging against increasing water scarcity and prolonged drought. These impacts are increasing as climate change accelerates. Client countries can mitigate these risks through lending developed through climate-resilience channels. However, risks of overexploitation are high and could lead to disastrous consequences,

so better knowledge is required. Strategic work on augmenting water supply through expanded reservoir storage is paramount in the face of increasing water security risks.

**Analytical work and decision support tools.** New methodologies are being integrated into existing economic analyses, such as decision making under uncertainty, to develop a more robust project design process. This complements the work being done under the Decision Tree Approach, which was applied to the Mwachi Dam in Kenya. This work can be scaled up to make a difference in how projects are designed to be resilient to climate and other risks.

**Experimentation with lending instruments.** The first World Bank investment project coming out of the Niger Basin CRIP is being designed as a Series of Projects, while other teams are considering a Multi-Phased Programmatic Approach as an instrument for any investment lending that might follow the river basin investment planning processes. These multistaged approaches are critical for doing the more longer-term, iterative, and flexible lending that is aligned with the concept of resilience building. Drought preparedness planning is key to mitigating climate change risk, but few countries have a structured way of doing this at the national or subnational level. Development Policy Operations (DPOs) could be an effective instrument for developing national drought policies that foster a more proactive approach to drought and climate change management.

Although no specific targets or new commitments related to the above “new areas” have been developed as yet, this work has potential to enhance cross-sectoral synergies and cross-GP collaboration. In particular, integrated watershed management, groundwater productivity, and drought preparedness planning and management require close collaboration among the Environment, Agriculture, and Global Practice for Social, Urban and Rural Development, and Resilience (GSURR) Practices. Activities include guiding governments in crafting policy and investing in infrastructure (including nature-based infrastructure) that is proactively addressing climate change risks.

## Niger River Basin

The Niger Basin is one of the most important transboundary basins in Africa. Its active hydrographic basin is 1.3 million square kilometers, spanning the territory of nine countries (Benin, Burkina Faso, Cameroon, Chad, Côte d’Ivoire, Guinea, Mali, Niger, and Nigeria). Its rapidly growing population of 130 million is expected to reach 180 million by 2025. Mali, Niger, and Nigeria account for almost 90 percent of the basin’s population and 70 percent of its territory. Although the area is urbanizing, 55 percent of the population in the basin is rural, except in Cameroon and Nigeria. The basin includes the capitals of Mali, Niger, and Nigeria. Poverty and inequalities are widespread in the Niger Basin, and some areas are prone to violence.

The Niger River system contributes to water, food, energy, job security, transport, and biodiversity, and it is a lifeline in the arid and semi-arid Sahel region. In the Niger basin countries, agriculture contributes 20 percent to 50 percent of gross domestic product (GDP),

and roughly two-thirds of people depend on farming for their livelihoods. The mostly family fishing and agropastoral systems are labor intensive and generate significant indirect employment as well.

The navigation role of the river system is important in Nigeria, but has decreased in the rest of the basin. The river is important for the energy security of the region, with an installed, partially integrated, hydropower capacity of 2,000 megawatts. Finally, the Niger hydrosystem sustains some of the most significant biodiversity areas in the world, notably the Inner and Maritime deltas in Mali and Nigeria.

Many of the vulnerabilities to climate- and water-related shocks and stresses are transboundary and include (i) competing water demands; (ii) high weather and hydrological variability; and (iii) sediment and contamination loads, resulting mostly from increased population pressures on land and vegetation cover.

Climate change is expected to compound these challenges. Climate and hydrological variabilities are expected to continue and may become more pronounced, increasing the frequency and intensity of floods and droughts. These natural disasters are already occurring in some countries, such as Zambia. Temperatures are likely to rise by at least 2°C, leading to greater demand for water. Most models agree that climate change will impact water resources by changing average annual precipitation in unpredictable ways.<sup>11</sup> Recent historical trends have shown an increased variability in the on-set and length of the rainy season. Changes in rainfall patterns will seriously modify the dynamics of the river and impact water-dependent sectors, such as agriculture and hydropower. Existing coping mechanisms may be insufficient, and livelihood strategies will need to adapt.

Climate change pressure increases the chance of political instability and local conflict emerging from heightened competition over scarcer natural resources. Migration of pastoralists, for example, will change as the climate changes, exacerbating fragility and conflict in the region.

Building climate resilience is integral to securing livelihoods and advancing development goals. Recognizing the benefits of a coordinated approach, the Niger Basin countries—led by the NBA and supported by the Cooperation for International Waters in Africa (CIWA) program, the World Bank, and the Africa Development Bank (AfDB)—joined forces in 2015 to develop a CRIP. The Plan consists of 246 resilience-building investments, with an estimated cost of US\$3.1 billion. Prioritized within existing regional and national development plans, the investments include climate insurance for farmers, gender policies to free up more productive time, anti-erosion and anti-silting measures to protect lands, rehabilitation of water storage structures to preserve supplies, and improved flood protection. These transboundary, national, and community interventions will help the region improve its ability to reduce risks and develop amid a changing climate. Progress was made in several areas, as summarized in table 4.1.

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11 The newer CMIP5 projections indicate average annual precipitation ranging from +30 percent to -10 percent.

**Table 4.1:** Progress of World Bank Support for the Niger River Basin, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>Engagement in a consultative process to prepare a CRIP</li> </ul>	<p>The WBG and nine country counterparts identified a priority set of interventions based on the CRIP for the Niger Basin presented at COP21. The bottom-up exercise identified 123 projects, at an estimated cost of US\$1.9 billion.</p>
<ul style="list-style-type: none"> <li>Hosting of donor roundtables</li> </ul>	<p>The WBG is finalizing preparation for lending operations that will implement important aspects of the CRIP, including the Sahel Irrigation Initiative Support Project, which was approved in December 2017, and the Economic and Environmental Rehabilitation of the Niger River (Mali) project, focusing on the Inner Delta.</p>
<ul style="list-style-type: none"> <li>Technical activities related to investment preparation</li> </ul>	<p>The WBG is working closely with the clients to prepare the Regional Niger Basin Resilience Program (a SOP) to address some of the needs identified in the investment plan, with a notional US\$500 million funding envelope, expected to be funded through IDA credits. The first project focuses on strengthening NBA's capacity for coordinated water resources management, implementing key measures proposed in the on-going CIWA-financed NBA institutional assessment and financing selected CRIP investments in Niger. Subsequent SOP projects will finance CRIP investments in the basin's other member states and may include further support to NBA. The AfDB is leading the preparation of a parallel project that will finance approximately US\$250 million of CRIP investments, the Integrated Development and Climate Change Adaptation Program in the Niger Basin: PIDACC.</p>
	<p>The WBG is supervising the implementation of the Sahel Irrigation Initiative project.</p>

### Forward Look

The Bank will finalize the preparation of Project 1 of the Building Climate Resilience in the Niger Basin Program and continue the preparation of the following projects of the Series of Projects (SOP). Preparation will be finalized for the AfDB Integrated Development and Climate Change Adaptation Program in the Niger Basin (PIDACC). Projects include increased use of remote sensing to improve monitoring of the basin; introducing climate change impacts and consideration of resilience into planning efforts; and pushing for better knowledge and management of groundwater sources, because they are key for hedging against climate scarcity and prolonged drought, but vulnerable to overexploitation.

### Resource Mobilization

In 2017 the NBA worked with projects and proposals to package investments targeted at specific funding sources, including the private sector. These priority projects include rehabilitation of hydraulic infrastructure, improvement of monitoring and early warning systems, restoration of watersheds, development of agroforestry, and institutional support.

#### Future Opportunities

The World Bank will continue supervising the implementation of SIIP, finalize the preparation of Project 1 of the Building Climate Resilience in the Niger Basin Program, and continue the preparation of the SOP. The PIDACC preparation will be finalized.

## Lake Victoria Basin

Lake Victoria Basin is a densely populated region, where livelihoods are largely dependent on natural resources. More than 80 percent of the basin's population rely on agricultural and livestock activities for their livelihoods, and more than 60 percent of the population depends on rainfed agriculture. More than 200,000 fishermen and their families depend on daily fish catches for subsistence. Poverty is pervasive in the basin, which is home to around 45 million inhabitants, with an estimated population density of 300 persons per square kilometer, much



higher than Africa's average of 36 per square kilometer. The dense population and low levels of development drive the unsustainable use of natural resources negatively impacting the lake.

Lake Victoria and its watershed are transboundary assets and are economically important to the five basin countries. Climate change and environmental stresses are mutually reinforcing. Land degradation and the loss of natural habitats exacerbate the impacts of rainfall extremes both upstream (through reduced retention of soil moisture and nutrients) and downstream (through siltation, flooding, and gully formation). In addition, climate change will increase the rate of environmental degradation in the lake: increased temperatures will accelerate eutrophication. An increased frequency and severity of floods and droughts will further drive erosion and increase sediment loads in runoff. Climate change effects on fisheries are likely to exacerbate the impacts of overfishing and pollution through stresses on key nursery grounds and changes in the thermocline (thermal layers) and nutrient cycles. Inadequate urban waste management increases the risks of, and from, flooding through blockage of storm drainage channels and polluted floodwaters. The spread of disease vectors may negatively affect poverty reduction. See table 4.2 for summary of World Bank support and project progress in the region.

**Table 4.2:** Progress of World Bank Support for the Lake Victoria Basin, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Assessment of climate risk of the Lake Victoria Basin</li> <li>• Provision of support to sustainable land and water management, including CSA and sustainable rural energy systems</li> <li>• Protection of the ecological infrastructure, including riparian buffer zones, wetlands, forests, water towers, national parks, and fish nursery grounds, and monitoring of climate-related processes affecting the lake's ecology (water hyacinths and water quality)</li> <li>• Promotion of resource-efficient production systems and green and resilient livelihoods with the private sector</li> <li>• Improvement of hydromet services and strengthening of infrastructure resilience, including maritime safety, lake transport infrastructure, and urban storm water management</li> </ul>	<p>Assessment of climate risks: completed for the Mwanza region of Tanzania, highlighting risks to communities from agriculture, water, urban and fishing sectors, among others; it will inform the development of climate-resilient investments under the LVEMP3.</p> <hr/> <p>LVEMP2, completed by the end of 2017, protects ecological infrastructure (forests, riparian buffers, wetlands) and generates benefits of environmental rehabilitation and climate resilience: 28,118 ha of land affected by soil erosion under sustainable land management practices; 3,523 ha of degraded wetlands restored or rehabilitated by the project through over 630 CDD activities. More than 12,000 farmers have adopted soil and water conservation measures under CSA practices.</p> <hr/> <p>LVEMP2 provided new public sanitation facilities (toilets in schools and markets) serving around 150,000 people; made major improvements in wastewater management in seven towns through rehabilitation, extension of sewerage networks, etc. Water navigation in the lake has been improved through water hyacinth control (physical removal and biological control), which has revitalized hundreds of hectares, and installation of towers and buoys at 37 locations on eight routes, which has improved navigation safety.</p> <hr/> <p>Under LVEMP2 a technical assistance on RECP resulted in around US\$26 million of private sector investment in more environmentally friendly (and energy and resource-saving) industrial processes across more than 100 participating companies. A new €4 million NDF grant seeks to expand the successful RECP to engage the private sector for green growth, and leverage US\$20 million of private investment.</p> <hr/> <p>The first phase of the LVTP in Rwanda was approved in 2017. A subsequent phase in Tanzania is under preparation, although it was dropped in Uganda. The program will support maritime safety on the lake, climate-resilient port infrastructure, and access to ports and lakeside communities.</p>

The Lake Victoria Environmental Management Project–Phase 2 (LVEMP2) worked basinwide to reduce environmental pressures and improve the welfare of communities. Activities have been implemented across three main components: (a) strengthening institutional capacity for managing water and fishery resources, (b) reducing point source pollution control and prevention, and (c) improving watershed management.

### Future Opportunities

The transport project and the LVEMP are coordinating with and complementing each other to manage climate and environmental risks to and from transport development and to support resilient rural livelihood development through both sustainable natural resources management and improved market access. Funding from UKAID (via the Corridors for Growth Trust Fund, administered by the World Bank) will support and inform the preparation of the regional transport program. Some of the funds will be used to assess climate risks to the lake, including (i) the probability of rapid changes in lake levels (and their impacts on coastal infrastructure, navigation safety, and key aquatic ecosystems); (ii) the effect on water quality; (iii) the effect on fish trade infrastructure and value chains; (iv) additional climate impacts on aquatic ecosystems, including risks from invasive species; and (v) climate vulnerabilities within the basin more broadly, particularly impacts on rural livelihoods and flood risk.

The third phase of the Lake Victoria Environmental Management Project (LVEMP3)—for the five basin countries and a Global Environment Facility (GEF grant) (to be determined)—will scale up LVEMP2. The interventions will include:

- Expansion and development of more systematic programs of sustainable land and water management which further incorporate climate resilience.
- Protection of ecological infrastructure, including riparian buffer zones, wetlands, forests, water towers, national parks, and fish nursery grounds.
- Partnering with the private sector to promote green industries.
- Enhancing hydromet knowledge and monitoring and forecasting services for improved disaster response and infrastructure resilience (including flood risk management and navigation safety).

## Zambezi River Basin

The Zambezi River Basin is one of the most diverse and valuable natural resources in Africa. Its waters are critical to sustainable economic growth and poverty reduction in the region. In addition to meeting the basic needs of more than 30 million people in the basin and sustaining a rich and diverse natural environment, the river plays a central role in the economies of the eight riparian countries (Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia, and Zimbabwe) and South Africa. It provides important environmental goods and services to the region and is essential to regional food security and hydropower production. Characterized by strong climatic variability, the river and its tributaries are subject to strong seasonal variation in the hydrological regime, with a cycle of floods and droughts that can have devastating effects on the people and economies of the region, especially the poorest members of the population.

After more than 30 years with little investment in the Zambezi River Basin, the 2011 Zambezi Watercourse Commission (ZAMCOM Agreement) drove increasing recognition of the need among the riparian states to find cooperative solutions to the challenges of development within the basin, as identified in the 2008 Zambezi Integrated Water Resources Management Strategy (ZAMSTRAT). Recommendations are being updated through the Strategic Planning Process, led by ZAMCOM. Medium-term outcomes include:

- **Poverty reduced** through expanded development and improved, coordinated, and sustainable water resources management.
- **Energy security** enhanced through hydropower investments (US\$10.7 billion), resulting in an additional 35,300 gigawatt-hours per year of firm energy and an additional 60,000 gigawatt-hours per year of average energy.
- **Agricultural production** increased, enhancing regional food security through an additional 343,000 hectares and increasing irrigation to 775,000 hectares per year
- **Increased employment**, particularly in the agricultural sector, with more than 500,000 jobs created.
- **Economic resilience** increased, and growth benefits sustained, through reduced exposure to floods (greater than US\$1 billion avoided losses on average per year) and adaptive measures to climate change.
- **Regional transport** costs and travel times reduced through bridge investments and navigation.
- **Water supplies** secured for urban and industrial demands (greater than 1,000 cubic megameters per year to Botswana, Malawi, Zambia, and Zimbabwe).
- **Environmental restoration** of the Zambezi Delta and improved fishery production through systematic introduction of basinwide environmental flows.
- **Tourism and mining** contributions to GDP increased through integrated, sustainable development.
- **Fishery production** enhanced through improved management of water resources.

Limited investment in additional generation capacity over the decades has undermined economic growth prospects. The development of the Batoka Gorge Hydro Electricity Scheme (BHES) was delayed, and the cost of this delay is estimated to be in excess of US\$7 billion in direct revenues through electricity sales and more than US\$45 billion in relation to the cost of unserved electricity. Zambia and Zimbabwe reached an agreement in 2012, and work is underway through the World Bank, AfDB, the European Union (EU), and other partners to update feasibility studies.

The World Bank program in the Zambezi Basin is aligned with the ZAMSTRAT and the objectives of the MDTF for CIWA. The objective of ZAMSTRAT is “Equitable, sustainable utilisation of water for social and environmental justice, regional integration, and economic benefit for present and future generation.” The strategy has been constructed around these four challenges: (i) integrated and coordinated water resources development; (ii) environmental management and sustainable development; (iii) adaptation to climate variability and climate change; and (iv) basinwide cooperation and integration. Progress based on CIWA support was made in several areas, as summarized in table 4.3.



Mangroves provide essential support for coastal protection and management all around Africa. The ACBP has launched several mangrove rehabilitation initiatives. (World Bank)

**Table 4.3:** Progress of World Bank Support for the Zambezi River Basin, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Strategic planning. A common investment planning framework meant to attract financing planned for cooperative management and development of international waters</li> </ul>	<p>Development of the Strategic Plan for the Zambezi River Basin is at an advanced stage. The diagnostic phase, whose key outputs were the Situation Analysis and Strategic Direction reports, are complete. Basin development scenarios are under preparation, to be followed by benefit-sharing assessments.</p>
<ul style="list-style-type: none"> <li>• Data sharing and DSS development. Purpose is for basinwide planning</li> </ul>	<p>A data and information sharing platform for the riparian states is operational. Initial system design of the information system is complete with a knowledge portal, time series, and spatial database. The integration of a DSS is near completion. A LiDAR analysis feeding into a dam break model is being developed for the entire Zambezi cascade under the leadership of the JOTC.</p>
<ul style="list-style-type: none"> <li>• Legislation and policy equivalence analysis. To inform harmonization of legal frameworks for transboundary water management and development</li> </ul>	<p>Harmonization options have been proposed, supported, and informed by a database of national legislation, gap analysis, and comparative analysis, ZAMCOM Agreement Comparative Assessment, and International Comparative Assessment. Options and recommendations will be considered in future support initiatives.</p>
<ul style="list-style-type: none"> <li>• Batoka hydropower development preparation. Feasibility studies, environmental impact assessments, and financial transaction advisory studies</li> </ul>	<p>All studies are at an advanced stage and are supplemented by additional analyses, taking into account climate variability and macroeconomic viability.</p>
<p><b>Resource Mobilization</b></p>	
<p>Opportunities for resource mobilization have occurred through the Strategic Plan for the Zambezi River Basin.</p>	



The permanent ZAMCOM Secretariat was established in 2011, with support from World Bank and Danida (see box 4.1). It leads the development of a basin-level strategic plan to be informed on a continuous basis, by an improved Zambezi Water Resources Information System (ZAMWIS). ZAMWIS will facilitate timely and informed water management decisions in the short term through forecasting and early warning systems, and in the long term through application of integrated basin models and information management systems in the planning and management of the basin's water resources. The plan is monitored and decided upon by the riparian Council of Ministers. ZAMCOM will employ forecasting and analysis from ZAMWIS, informed by national data and development plans, in laying out its basinwide strategic plan for countries to cooperatively manage and develop shared water resources. The basin population is expected to grow from 40 million in 2010 to 70 million in 2040. For example, it is estimated that the BHES, which is part of ZAMSTRAT, is estimated to provide sufficient energy for more than 1.2 million households, substantially contributing to safeguarding development gains and supporting further economic growth.

#### **Box 4.1 Establishment of ZAMCOM and ZAMWIS**

Working with other development partners, such as Danida, the project has yielded positive results with the establishment and operationalization of ZAMCOM, based on annual contributions from the member states to cover the minimum functionality regarding its operations. In addition, a water resources information system (ZAMWIS) for the whole basin, which is linked to country systems, is now operational and serves as a data exchange platform complete with a knowledge portal, time series, and spatial database.

#### **Future Opportunities**

The Zambezi Basin is one of four priority river basins in Africa under the CIWA MDTF transboundary water program. The Zambezi program provides the foundations for a broader and more complex engagement of the World Bank with stakeholders, and supports the operationalization of ZAMCOM. This engagement can catalyze future financing opportunities in the basin through a pipeline of climate-proofed, investment projects that are being identified under the basin strategic planning process. Moreover, ongoing activities are using innovative technologies that will help identify further areas for support, such as Light Detection and Ranging (LiDAR) and modeling.



Artisanal fishers prepare to go out to sea in Guinea on boats called “pirogues.” (World Bank/Vincent Tremeau)

## 5. Fostering Climate-Smart Ocean Economies

### Context

More than 60 percent of the world’s economic output takes place near coastlines. The ocean economy in some African countries contributes as much as 27 percent of revenues and a third of export revenues. For example, an estimated US\$22 billion a year is derived from the coastal and marine resources of the Southwest Indian Ocean region. Coastal tourism is the largest contributor to gross domestic product (GDP) in Africa, at more than US\$11 billion a year.

In recognition of the oceans’ importance, in 2015, world leaders adopted the Sustainable Development Goal (SDG) 14 at the UN General Assembly (“Conserve and sustainably use the oceans, seas and marine resources”). Given the interconnectedness between climate change (SDG 13) and the blue economy, the proposal here seeks to foster climate-smart ocean economies in Africa. In 2014, African heads of state and governments pledged to embrace and develop the blue economy concept as a vital part of the future development to be outlined in the African Union’s Agenda 2063. In 2015, the Indian Ocean Rim Association adopted the Mauritius Blue Economy Declaration, which recognizes the interconnectivity of fisheries, infrastructure, energy, and seabed mining. The Bank supports ocean economies in Africa centers through provision of technical assistance and reimbursable advisory services; and investment project finance operations in support of pilot fisheries, and climate-resilient livelihood projects. Progress is summarized in table 5.1. See box 5.1 for a successful project in Liberia.

Regional commissions in charge of fisheries support regionally coordinated investment plans for climate-resilient fisheries and coastal livelihoods. In West Africa, the Sub-Regional Fisheries Commission adopted the regional dashboard to facilitate the exchange



**Table 5.1:** Progress of World Bank Support for Climate-Smart Ocean Economies, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Provision of technical assistance and reimbursable advisory services</li> <li>• Provision of investment project finance and funding program-for-results operations in support of pilot fisheries, and climate-resilient livelihood projects</li> </ul>	<p>The program has made good progress on key fronts of technical assistance, provision of investment project finance operations in support of sustainable fisheries management, blue economy development, climate-resilient livelihood projects, and knowledge exchange among practitioners.</p> <hr/> <p>The WBG made US\$17.1 million in direct investments in Climate-Smart Ocean Economies. Steady progress has been made against the target of US\$220 million (by 2020), increasing from 9 percent in FY16, to 42 percent in FY17, and 71 percent in FY18, through direct investments and program-for-results operations in support of pilot fisheries and climate-resilient livelihood projects.</p> <hr/> <p>The WBG mobilized US\$500 million from the NDF in support of this agenda.</p> <hr/> <p>The WBG provides technical assistance to inform national investment plans in such areas as helping regional commissions monitor fisheries and incorporate climate variations into the scientific evidence governing fishery management, and it is on schedule.</p> <hr/> <p>Support to key regional forums (e.g., “Financing Sustainable and Climate-Resilient Ocean Economies in Africa” held in Seychelles in 2018) and knowledge exchange continues between countries (e.g., Comoros, Madagascar, and Mozambique, and between São Tomé and Príncipe and Southwest Indian Ocean countries, as well as between West African countries).</p> <hr/> <p>In August 2018, the WBG priced a SKr 1 billion seven-year bond, the first in the series. The bond series aims to raise at least US\$3 billion, allowing investors to highlight their support for the SDGs that address water, sanitation, and marine protection by investing capital toward global public goods. Climate-Resilient Livelihoods and Ecosystems in the Coastal Zones of Tanzania are being implemented by investment projects.</p> <p><b>Highlights</b></p> <p>SWIOFish1 (P132123), SWIOFish2 (P153370), and SWIOFish3 (P155642) strengthen fisheries governance, such as compliance of SWIOFC States with the Indian Ocean Tuna Commission (IOTC) Conservation and Management Measures and support of shared growth in Comoros, Mozambique, Tanzania, Madagascar, and Seychelles.</p> <hr/> <p>The first Blue Bond, an innovative financing tool, has been issued by the Government of Seychelles in October 2018 with the support of the WBG. The Bond will be used to support the transition to a blue economy in Seychelles.</p> <hr/> <p>Drawing from lessons learned in other WBG fisheries projects, a new Advisory Services and Analytics (ASA) was developed to improve fisheries’ governance and increase economic benefits for member countries of the Gulf of Guinea Regional Fisheries Commission (COREP), and to lead to investment operations in COREP.</p> <hr/> <p>The Fisheries Transparency Initiative (FITI), designed to help institutionalize transparency in the fisheries sector, was successfully completed during the course of 2018.</p>

**Forward Look**

Client demand is growing quickly toward maritime spatial planning (MSP). The World Bank could increase technical assistance (TA), help identify opportunities, and carry out investments.

**Resource Mobilization**

- IDA target exceeded expectations threefold.
- Good pipeline.
- Continued need for resource mobilization.

of information and the monitoring of climate change on fisheries. In East Africa, a Working Party on Collaboration and Cooperation in Tuna Fisheries is managed by the Southwest Indian Ocean (SWIO) regional fisheries body.

Since 2010, the WARFP has invested US\$174 million in sustainable contributions of fisheries to wider economic growth in eight West African countries, with the proactive support of the Sub-Regional Fisheries Commission. The multiphased program’s achievements include

## Box 5.1 Launch of Improved Smoking Ovens in Liberia

In Liberia, the World Bank's West Africa Regional Fisheries Program (WARFP) piloted the construction and use of four improved smoking ovens at the Robertsport landing cluster. Such ovens are more fuel-efficient than the traditional stoves used in the region, contributing to lower fuel expenses up to 50 percent. The ovens also have faster smoking times and reduced smoke emissions, decreasing negative health impacts such as respiratory problems and eye irritations. The fish products have higher quality taste and appearance than fish smoked traditionally, leading to higher prices up to double for certain species.

The pilot attracted the interest of fish processors. Some women ride two hours by bus to get to Robertsport and buy the fish, rent the ovens for overnight use, and bring the fish products back to the market in Monrovia the next day. The Liberia Artisanal Fishermen Association brought several groups of fish processors to visit the pilot site in Robertsport. The successful piloting of such ovens in Liberia and the level of demand generated from fish processors led WARFP scale up the introduction of such improved smoking technology in other countries.

a drastic reduction in illegal fishing by foreigners, improved livelihoods at pilot community-led fisheries management sites, and a modernized governance framework. The program is preparing its second phase in Sierra Leone, Liberia, Cabo Verde, The Gambia, Guinea-Bissau, and Senegal. Phase II will fund (i) climate-resilient landing facilities; (ii) adoption of improved smoking ovens in fishing communities of selected countries; (iii) the pilot of different fishing methods and gears to improve sea safety; and (iv) education and awareness raising in fishing communities to understand the effects of climate change on fishing patterns.

The World Bank-funded Southwest Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish) has invested US\$220 million since its inception. It operates in 11 countries, in coordination with the Indian Ocean Commission, the West Indian Ocean Fisheries Commission, and the IOTC. The objective is to increase the economic, social, and environmental benefits of sustainable marine fisheries to countries in the region. The capacity of the Southwest Indian Ocean Commission (SWIOFC) continues to be strengthened through the SWIOFish1 project (P132123) and the compliance of SWIOFC States with the IOTC Conservation and Management Measures is increased through SWIOFish2 (P153370).

With support from SWIOFish1, the Government of Mozambique developed and approved several legal and policy instruments related to its blue economy that consider climate change adaptation and mitigation aspects, in particular the Policy and Strategy of the Sea. With support from the Artisanal Fisheries and Climate Change Project, six Mozambican coastal communities developed alternative livelihood initiatives to be implemented with local co-management plans, which will be finalized in 2018.

Kenya has declared its blue economy as a priority frontier, expected to help increase livelihood opportunities and levels of income, nutrition, and food security. The Kenya Marine Fisheries and Socio-Economic Development is a US\$100 million project under preparation that focuses on improving governance and management of fisheries, enabling sustainable investment in marine fisheries and aquaculture, and strengthening



Children in Saint-Louis, Senegal, play with the kite on the beach. In Saint-Louis, social protection and coastal protection and resilience go hand in hand. (World Bank/Vincent Tremeau)

coastal livelihoods. The project also supports short- and long-term climate change risk mitigation measures, including climate-smart infrastructure. The expected Board approval is expected in FY19 Q3, while consultancies are being procured to (i) identify potential impacts of climate change on Kenya's coastal communities and ecosystems, including marine fisheries; and (ii) develop a set of short- and long-term risk mitigation measures, including at the community level, to be implemented under the project.

The Bank and the Government of Mauritius launched the report *The Ocean Economy in Mauritius: Making it Happen, Making It Last* (Cervigni and Scandizzo 2017). The report assesses the potential of fisheries and aquaculture, marine information and communications technology, renewable energy, and ports. It outlines a three- to five-year action plan that identifies possible investment scenarios in priority sectors.

## Future Opportunities

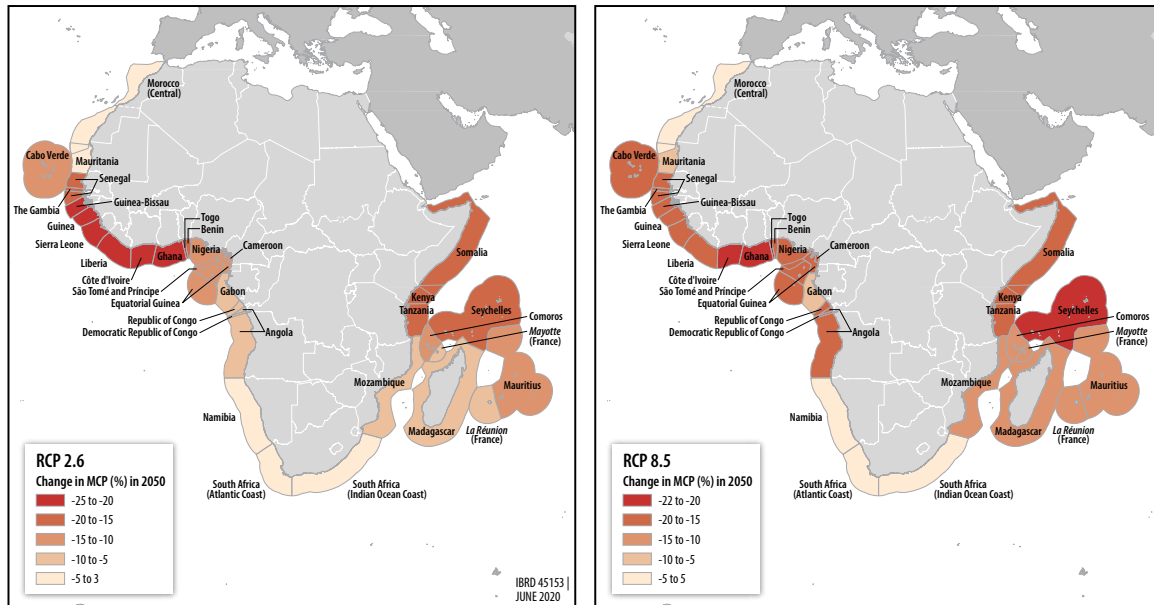
Substantial opportunities exist for further development in 2018. The body of evidence and our understanding of the impacts of climate change on fisheries are fast evolving, yet the effects are underquantified and confined to the academic and scientific domains. Policy makers, donors, and other stakeholders urgently need additional analysis, evidence-based information, and, above all, prioritized, cost-effective options for solutions to guide investments better in line with climate change adaptation and mitigation, thus maximizing prospects for development and poverty reduction. For such reasons, the Bank has put forth a two-phased report investigating the impact of climate change on fisheries to generate evidence-based analysis and a prioritized set of options to guide investments. Therefore, policies can be aligned with cost-effective climate change adaptation and mitigation strategies, while consequently maximizing the prospects for development and poverty alleviation. Map 5.1, panels a and b, show the projected impact per countries using one of the models (World Bank 2019).

The report launch in December 2019 will be accompanied by technical discussions with academia and scientists on the best way to leverage its results for the development of Part II,

**Map 5.1:** Change in Maximum Catch Potential (%) Under (a) Low and (b) High Greenhouse Gas Emission Scenarios by 2050 Using the Dynamic Bioclimate Envelope Model, 2019

a. Low GHG emissions

b. High GHG emissions



Source: World Bank, 2019b

Note: Panels show either low or high GHG emission scenarios in the 2050s (mid-term) using Mizer.

which will focus on developing a set of prioritized, cost-effective investment strategies (e.g., ranking options to maintain or enhance current fishery outcomes in the face of projected climate change, by cost) to better target development and poverty reduction goals.

The can inform the development of a regional program in the fisheries sector for the COREP area, responding to the COREP Council of Ministers' interests.

The successful piloting of four improved smoking ovens at the Robertsport landing cluster in Liberia and the level of demand generated within fish processors suggest scope for a scale-up in the other West Africa coastal countries that are part of WARFP.

In Mozambique, the First Artisanal Fisheries and Climate Change Project supported the development of sustainable income-generation projects, which are expected to improve the overall socioeconomic and environmental resilience of targeted communities, including resilience to climate change-related risks.

## 6. Developing Climate-Smart Cities

### Context

The World Bank is supporting climate- and disaster-resilient development in selected Sub-Saharan African cities through policy dialogue, technical assistance, and investment financing. Stronger capacity for integrated risk management is expected to benefit more than 100 cities, including multiple small- and medium-sized cities, reaching about 70 million people.

Efforts have moved beyond technical assistance toward dedicated financing in three areas: (i) capacity building; (ii) resilient infrastructure, buildings, and services; and (iii) partnerships and city networking for knowledge sharing. Current urban resilience efforts in Africa include raising awareness, resilience planning, better preparedness to disasters, and resilient infrastructure, as summarized in table 6.1. While resilience plans across several cities of Sub-Saharan Africa are being developed, additional funding will be needed most urgently to help support the implementation of these plans. Additionally, many other cities across the continent will need support to prepare and implement resilience plans.

**Table 6.1:** Progress of Support to Climate-Smart Cities, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Provision of US\$50 million in technical assistance for 30 cities</li> <li>• Investment of US\$2 billion to support climate- and disaster-resilient development in 30 cities</li> </ul>	<p>Efforts have moved beyond technical assistance toward dedicated financing in three areas: (i) capacity building; (ii) resilient infrastructure, buildings, and services; and (iii) partnerships and city networking for knowledge sharing.</p> <hr/> <p>Stronger capacity for integrated risk management is expected to benefit more than 100 cities and about 70 million people. Capacity building activities through technical assistance have ranged from diagnostic studies to deepen understanding of multisectoral linkages across the urban space, damage assessments from climate-related disasters to support resilient recovery, scaling up of nature-based solutions for flood protection, and open data for resilience initiatives to support evidence-based decision making.</p> <hr/> <p>The target of developing resilience plans in 20 African cities by 2022 has been well surpassed, with local resilience planning and capacity building activities completed or underway in more than 100 cities (across 10 countries). Activities are also planned for two large cities (Accra and Kinshasa) and one megacity (Dar es Salaam).</p> <hr/> <p>The WBG has committed a total of US\$2.27 billion to support investment operations for climate- and disaster-resilient development in urban areas across 12 countries. Approximately US\$624 million in investments is planned for FY19.</p> <hr/> <p>Of the target investment in resilience-building activities for nine cities, operations are ongoing across 12 countries. Seven of the operations directly target specific cities are ranging in size from medium (Saint Louis, Freetown) to large (Accra, Antananarivo, Dakar, Dar Es Salaam, Ibadan), while the remaining five operations have a larger geographic scope, covering several cities across the country. An additional seven investment operations are planned for the next fiscal year with large-scale investments targeted for the cities of Accra, Cotonou, Dar es Salaam, and Kinshasa.</p>

**Table 6.1:** Progress of Support to Climate-Smart Cities, June 2018 *(continued)*

Forward Look
Climate-Smart Cities is a crucial and large multisectoral business line. Policy changes to improve the form and functions of African cities; shift to climate-resilient buildings, infrastructure, services, efficient land-use and planning and building regulations; and enforcement capacity are key. There is a critical need to invest in upstream analysis on making a case for such investments, and knowledge exchange with other regions that have gone through such transitions.
Resource Mobilization
<ul style="list-style-type: none"> <li>• IDA and total targets have exceed expectations.</li> <li>• Need for continued resource mobilization.</li> </ul>

**Table 6.2:** Ongoing and Planned World Bank Investments in Climate-Smart Cities in Africa

City	Project name	Purpose	Size of investment (US\$, millions)
<b>Ongoing</b>			
Antananarivo, Madagascar	Integrated Urban Development and Resilience Project	Improve living conditions in low-income communities	75
Dakar, Senegal (with the cities of Diamniado and Saint Louis benefitting)	Storm Water Management and Climate Change Adaptation; co-financing from the GEF Sustainable Cities program	Flood prevention and preparedness and urban resilience planning	96.1
Freetown, Sierra Leone	Freetown Emergency Recovery Project	Rehabilitate critical infrastructure and strengthen capacity for managing disaster risk	10
Ibadan, Nigeria	Ibadan Urban Flood Mitigation	Flood risk mitigation preparedness	200
Saint Louis, Senegal	Saint Louis Emergency Recovery and Resilience Project	Planned relocation of populations living in the highest risk coastal zones and urban resilience planning	30
Seven cities in Cameroon	Cameroon Inclusive and Resilient Cities Development Project	Improve urban management, access to infrastructure and increase resilience to floods	160
Several (118) cities in Ethiopia	Urban Infrastructure and Institutional Development Project	Urban emergency response and disaster risk management planning	600
Seven cities in Togo	Togo Infrastructure and Urban Development Project	Improve access to infrastructure and strengthen capacity for urban planning and management	30
<b>Planned</b>			
Accra, Ghana	Greater Accra Resilient and Integrated Development Project	Climate-resilient flood mitigation measures, urban upgrading	100
Cotonou, Benin	Benin Urban Resilience and Storm Water Management Project	Flood prevention and preparedness and urban resilience planning	100
Dar es Salaam, Tanzania	Additional Financing to the Metropolitan Development Project	Planned relocation of populations at risk and integrated investments	120
Kinshasa, Congo, Dem. Rep.	Kinshasa Urban Development and Resilience Project	Risk sensitive urban planning and development	150
Mogadishu, Somalia	Somalia Urban Resilience Project		9



In terms of partnerships and city networking for knowledge sharing, the Bank is a part of the Medellín Collaboration on urban resilience and has been working closely with international partners, including the Cities Alliance, UN Habitat, the Global Facility for Disaster Reduction and Recovery (GFDRR), the Global Environment Facility (GEF), the Rockefeller Foundation and its 100 Resilient Cities initiative, the International Council for Local Environmental Initiatives (ICLEI), the C40 Cities Climate Leadership Group, German Corporation for International Cooperation (GIZ), and the French International Development Agency (AFD). See box 6.1 for an example of strengthening resilience in a coastal city.

### **Box 6.1 Strengthening Resilience in Coastal Cities: Saint Louis Emergency Recovery and Resilience Project**

The historical city of Saint-Louis (registered as a World Heritage Site by UNESCO in 2000) is on the northwest coast of Senegal at the mouth of the Senegal River. With a population of 232,000 (2017), the city has experienced rapid growth over the last 50 years. Languede Barbarie is a thin, sandy peninsula adjacent to the Atlantic Ocean, which plays an important role in the protection of the city. While its geophysical characteristics, including the wind and wave climate, render this shoreline susceptible to natural erosion processes, human activities such as unplanned settlement and climate change impacts have significantly exacerbated erosion. In recent years, coastal erosion along the Languede Barbarie has accelerated, with up to 5 meters to 6 meters of beach loss per year.

Devastating storm surges took place in August 2017 and February 2018, rendering more than 250 families homeless, with many living in very precarious conditions in the flood-prone Khar Yalla relief camp and inadequate access to basic services. Saint Louis has identified all households (approximately 10,000 people)—in addition to the families that have already lost their homes within a band of approximately 20 meters along the sea as being within the extremely high-risk zone. With the Languede Barbarie area experiencing two to three severe storm surges per year, it is expected that many of these families within the extremely high-risk zone will lose their homes within the next few years.

In response, the World Bank is financing the US\$30 million Senegal Saint Louis Emergency Recovery and Resilience Project (SERRP), which aims to reduce the vulnerability of populations to coastal hazards along the Languede Barbarie and strengthen urban and coastal resilience planning of Saint-Louis. The project can respond to immediate-, medium-, and longer-term needs associated with both the urgency of the disaster response, combined with longer-term planning to address the causes of vulnerability.

For the most immediate needs regarding the displaced population, the SERRP will support the Government of Senegal to provide temporary accommodation and essential services for affected households, and urgently improve their living conditions in line with global standard practices. The temporary shelter solution will accommodate disaster victims during the transitory phase until a permanent housing solution is available, for an estimated period of two to three years. For the medium-term, the project will support the planned relocation of vulnerable households affected by coastal erosion and living within the extremely high-risk zone along the Languede Barbarie. For longer-term resilience building, the SERRP will support activities such as reclamation or restoration of the vacated land along the Languede Barbarie, the design of a coastal risk management solution to protect its shoreline, and development of an urban resilience plan.



A street scene in Madagascar, where green, resilient cities can mean healthier populations. (World Bank/Arne Hoel)

## Reflections and Opportunities for Future Progress

With an ongoing and pipeline portfolio of US\$2.9 billion in investment operations, which already surpasses the target of US\$2 billion by FY23, the Climate-Smart Cities is a crucial and large business line under the Africa Climate Business Plan (ACBP). This multisectoral business line involves coordination and cooperation of various Global Practices (GPs), primarily Water, Transport, Environment, Energy, Social Protection, and Health. Policy changes aimed at improving form and functions of African cities as well as ensuring climate-resilient buildings, infrastructure, and services are fundamental for reducing cost, improving efficiency, reducing poverty, and increasing the Africa Region's climate resilience. African cities are sprawling and mostly monocentric, as well as unprepared to absorb phenomenal urban growth predicted in coming years.

To support Africa's urban transition, the key focus of the World Bank should be to support Development Policy Operations (DPOs) and other measures and incentives to improve implementation of efficient land use and planning regulations, building regulations, and ensuring that the national and subnational governments have sufficient implementation and enforcement capacity. There is a need to invest in upstream analysis on making a case for such investments by showing economic and social benefits, and knowledge exchange with other regions that have gone through such transitions. Coastal cities also require special attention and coordination with environment, energy, food, and water sectors due to the concentration of population and economic activities. Green buildings should be in the business line of Climate-Smart Cities. Additionally, the transport sector is developing climate-resilient design codes for resilient transport infrastructure, which are relevant and need to be part of the Climate-Smart Cities' agenda.



Rebuilding dunes in Mauritania protects communities from aggravated coastal erosion. (World Bank)

## 7. Strengthening the Climate Resilience of Coastal Zones in West Africa

### Context

The West Africa Coastal Areas Management Program (WACA) is a response to the increasing perils of coastal erosion and flooding, while better tapping the potential of the blue economy. The program uses a mix of technical assistance and investments to strengthen the resilience of coastal communities and their assets against climate and other natural hazards. It relies on engineering and nature-based solutions and will support the preservation and rehabilitation of natural coastal resources. See box 7.1 on ways of measuring progress toward coastal resilience.

The program cooperates with the West African Economic and Monetary Union (WAEMU), the Secretariat of the Abidjan Convention, the Ecological Monitoring Center (CSE), and the International Union for Conservation of Nature (IUCN).

Under the WACA Platform, outreach is ongoing with other development partners, including France, Spain, The Netherlands, the European Investment Bank, the Arab Bank for Economic Development in Africa, the OPEC Fund for International Development, the Islamic Development Bank, the African Development Bank (AfDB), the European Union (EU), the Global Environment Facility (GEF), the Korea-World Bank Partnership Facility, and the Green Climate Fund (GCF). Progress was made in several areas, as summarized in table 7.1.





**Table 7.1:** Progress of World Bank Support to Address Coastal Erosion in Western Africa, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Provision technical assistance for national and regional policy dialogues, stakeholder engagement, assessment of the cost of coastal degradation, generation of data and knowledge for adaptive coastal management, development of decision-making tools, and the preparation of climate-resilient coastal development and investment plans</li> <li>• Investment in hard and green infrastructure, including constructing of transportation networks, piers, artificial reefs, groins, and other erosion and flooding management infrastructure and transportation networks (hard infrastructure) and the preservation and expansion of green or natural infrastructure (mangroves, sand dunes, vegetation, coastal aggregates, coastal forest, lagoons and coastal swamps, water plants, and so forth) that provide services that manage coastal erosion and flooding (green infrastructure)</li> <li>• Scaling up engagement with other regions of Africa experiencing similar pressure in coastal zones</li> </ul>	<p>A coalition of client countries and development partners are advancing the WACA program to strengthen resilience of coastal communities and their assets against climate and other natural hazards. A total of US\$225 million of investment project financing (IPF) and about US\$10 million in technical assistance (TA) have been mobilized.</p> <p>The WBG Board approved in April 2018 US\$190 million of IDA and US\$20.25 million of GEF for the five-year WACA Resilience Investment Project (P162337, WACA ResIP) for six countries (Benin, Ivory Coast, Mauritania, São Tomé and Príncipe, Senegal, and Togo) and four regional institutions: WAEMU, the Secretariat of the Abidjan Convention, the CSE, and the IUCN. The program will address coastal erosion, flooding, and improved watershed management, and support pollution control. The project has already leveraged €12 million from the NDF, as well as US\$3 million worth of technical assistance from the European Space Agency.</p> <p>A WACA platform has mobilized an additional €5 million from the NDF and US\$1 million from the GFDRR. The main pillars include establishing a Knowledge Management System to channel expertise and solution to countries, a WACA Market Place to match available finance with countries' needs, a Regional Dialogue Mechanism to pursue decision and commitments from partners, and an International Expertise System.</p> <p>A dialogue has started with the ICC, which supports implementation of the regional strategy on safety and security within the Central and West African common maritime space.</p>
<b>Forward Look</b>	
<p>Recognizing the need for US\$2 billion of financing, the WACA Platform will seek to attract existing and new financing instruments.</p>	
<b>Resource Mobilization</b>	
<ul style="list-style-type: none"> <li>• IDA target has exceeded expectations.</li> <li>• Resource mobilization continues through the WACA Platform.</li> </ul>	

## Box 7.1 Measuring Progress toward Coastal Resilience

Resilience is applied to many contexts, including transport, agriculture, and social protection, but there is no common set of tools and approaches in assessing progress. Measuring coastal resilience is even more difficult because of the multiple sectors operating on the coast, and the environmental goods and services provided by the ecosystem and increasingly under threat from climate change. In WACA, coastal resilience is measured in terms of the ability to mitigate, adjust to, or to create a fundamentally new system so as to avoid negative impacts from threats and hazards—measuring the absorptive, adaptive, and transformative capacities of coastal communities.

The project activities are estimated to directly benefit approximately 200,000 people at project sites in the six beneficiary countries; they live along the coast and depend on it for their livelihoods. These people, including women and youth, and people living on marginal lands on barrier islands and near lagoons are at immediate risk from coastal erosion, flooding, and salinity intrusion. They also suffer from the negative impacts of both marine and coastal pollution. Their livelihoods are often highly dependent on natural resources or ecosystem services that are increasingly being degraded. Unlike other segments of society, poor people have few savings to draw on to respond to shocks and typically have very limited access to formal credit or recovery resources. Therefore, the focus in measurements of improved resilience is on households and the reduction in exposure to erosion, flooding, and pollution.

In addition, because of the transboundary nature of the risks, the project will measure progress made on collaborative agreements between regional institutions to ascertain that regional commitments are incorporated within national sectoral plans, that a mechanism is in place to monitor Coastal Erosion, Flooding, and Pollution (CEFP) reduction, and that the regional coastal observatory (MOLOA) is established and operational.

*Source:* World Bank website, <http://projects.worldbank.org/P162337?lang=en>.

## Future Opportunities

Recognizing the needs for financing—US\$2 billion—vastly surpass available funding, the Bank management committed in July 2018 to establishing the WACA Platform to attract existing and develop new financing instruments. Initially, the platform would be hosted by the Bank, to provide technical assistance and link donors to countries. Over time, when capacity is built, trust established, and a coordinating mechanism formalized among the WACA countries, this facility would be moved to a suitable institution in West Africa.

# 8. Promoting Climate-Resilient Transport

## Context

In the African context, transport operations are vulnerable to climate impacts. Across the continent, transport services and infrastructure are affected by higher frequency and intensity of extreme wind and storm events, increased precipitation intensity, extreme heat, and change in average precipitation patterns. In addition, transport infrastructure investments along coastal areas are exposed to sea level rise and storm surges. Consequently, roads are damaged more often, and are costlier to maintain. Major infrastructure assets such as ports, railway, or airports have a shorter life span and operational capacity than expected.

Moreover, although historically the Africa Region has the lowest greenhouse gas (GHG) emissions of any continent, this share is now growing rapidly, driven by the increase in fossil fuel use. Urban air pollution in African cities is on the rise, due to rapid economic and population growth and an increase in motorization.

Conscious of these challenges, the World Bank proposed a transport business plan, which was presented at Conference of Parties (COP22), in Marrakech. The plan complements the first Africa Climate Business Plan (ACBP) by developing a strategy and work program to mainstream the climate challenge into transport programs in Sub-Saharan Africa. Specifically, the proposed business plan focuses on two strategic objectives: (i) improving the resilience of African transport infrastructure to climate change; and (ii) improving the carbon efficiency of transport systems in Sub-Saharan Africa. Mainstream climate benefits into the Bank’s transport program for Sub-Saharan Africa are summarized in table 8.1.

**Table 8.1:** Expected Outcomes of World Bank Support for ACBP

Activity	Expected outcomes	
	Fast track (by 2023)	Longer term (by 2026)
Strategic Objective 1: Improving the climate resilience of African transport infrastructure <ul style="list-style-type: none"> <li>• Vulnerability assessments of selected transport infrastructure</li> <li>• Climate-resilient infrastructure design</li> <li>• Revision of design standards and specifications</li> </ul>	<ul style="list-style-type: none"> <li>• Vulnerability assessments of selected transport infrastructure done in at least three countries</li> <li>• Securing financing for road maintenance in at least three countries</li> <li>• Projects with climate-resilient infrastructure design in at least</li> </ul>	<ul style="list-style-type: none"> <li>• Vulnerability assessments of selected transport infrastructure done in at least six countries</li> <li>• Securing financing (through road funds) for road maintenance in at least six countries</li> <li>• Projects with climate-resilient infrastructure design in at least five countries</li> <li>• Improving resilience of coastal road infrastructure in five countries</li> </ul>



**Table 8.1:** Expected Outcomes of World Bank Support for ACBP (*continued*)

Activity	Expected outcomes	
	Fast track (by 2023)	Longer term (by 2026)
Strategic Objective 2: Improving the carbon efficiency of transport systems <ul style="list-style-type: none"> <li>• Climate-smart spatial planning</li> <li>• Modal shift to urban transport</li> <li>• Modal shift to railroad transit</li> <li>• Fleet management and scrappage</li> </ul>	<ul style="list-style-type: none"> <li>• Projects with climate-smart spatial planning in at least one country</li> <li>• Bus rapid transit projects in at least two countries</li> <li>• Truck fleet renewal projects in at least two countries</li> </ul>	<ul style="list-style-type: none"> <li>• Projects with climate-smart spatial planning in at least three countries</li> <li>• Bus rapid transit projects in at least five countries</li> <li>• Truck fleet renewal projects in at least two countries</li> <li>• Railway infrastructure rehabilitation project in at least one country</li> </ul>
Main partners	Cumulative resource mobilization <sup>a</sup>	
	Fast track (by 2020) (US\$, millions)	Longer term (additional funds by 2024) (US\$, millions)
Governments, multilateral and bilateral development partners (French Agency for Development, European Investment Bank, Ministry of Foreign Affairs Netherlands, Ministry of Dev. Cooperation Netherlands), private sector (foreign private commercial sources, Tanzania Public Private Partnership Support Program), GCF	300	900

*Note:* Based on FY15–18 average, Transport ACBP Commitment share, and the average assigned share of climate co-benefits financing, it is estimated that 45 percent of the total resource mobilization represents the assigned climate co-benefits financing.

Implementation of the transport component is underway. Progress was made on the analytic, strategic, and investment financing fronts, as summarized in table 8.2.

**Table 8.2:** Progress of World Bank Support for Climate-Resilient Transport, FY16–FY19

Activity	Progress
<ul style="list-style-type: none"> <li>• Provision of financial support</li> <li>• Provision of analytical support and strategic engagement</li> </ul>	<p>Over this period, efforts to embed climate resilience and low-carbon measures as part of the project design led to a progressively larger share of newly approved transport projects in Africa aligned with the transport objectives under the ACBP: (i) improve the resilience of African transport infrastructure to climate change; and (ii) improve the carbon efficiency of transport systems in Sub-Saharan Africa.</p> <p>This resulted in a commitment of US\$1.9 billion, of which 90 percent are IDA funds, for 15 climate-informed projects over that three-year period. The latest addition to the WBG portfolio consists of four climate informed transport projects and represents the entirety of the FY18 transport approvals for Africa, with a combined IDA financing commitment of US\$553 million.</p>

**Table 8.2:** Progress of World Bank Support for Climate-Resilient Transport, FY16–FY19 (*continued*)

### Forward Look

To move from a reactive to a proactive business model on climate-resilient and low-carbon transport in Africa, the Bank will continue to emphasize transformative core technical work on resilience and decarbonization of transport systems.

Core technical work on resilience includes: (i) working on logistics and freight, including better multimodal connections; (ii) country-level infrastructure vulnerability assessments by refining and scaling-up existing methodologies; (iii) increasing resilience of urban mobility systems by improving planning processes to avoid creating vulnerabilities; (iv) systematically integrating climate data and hydromet information into design of infrastructure and services; (v) a priori planning for disaster recovery in the transport sector; (vi) building client capacity to create, use, and communicate data products; (vii) better integration of road infrastructure design with watershed management to avoid creating future vulnerabilities in a front-of-pipe, proactive manner; and (viii) promoting research on techniques of decision making under uncertainty to help countries make flexible infrastructure investment decisions in the face of highly uncertain future conditions.

Core technical work on low-carbon transport includes: (i) growing the urban transit business line, investing in better upstream spatial planning in urban areas, emphasizing vehicle fleet management as a way of controlling emissions; (ii) improving the efficiency of the trucking fleet, which carries the largest share of African ton-kilometers of freight, as well as finding ways to better harness the efficiency improvements offered by better freight logistics; and (iii) working on improving the enabling environment in African countries, for example by changing subsidy regimes that are not conducive to climate resilience

### Resource Mobilization

- IDA target met with strong pipeline.
- Need for continued resource mobilization.

## Lessons Learned and Challenges Faced

The first line of defense for resilience in the roads sector is maintenance: it offers the best return on investment through protection from damage caused by climatic conditions. The Global Practice (GP) is pursuing community-based delivery of basic maintenance services, particularly in rural areas, and is investigating means of collecting user fees to pay for routine maintenance. This approach requires both upstream involvement at a policy level and iterative learning through constant feedback.

The GP is consolidating best practices for physical improvements that can be brought to rural roads, given the importance of the stock of unpaved rural road assets in Sub-Saharan Africa. Guidelines on technical design elements to improve resilience have been developed this year in the context of a feeder roads project in Mozambique, intended to reverse the traditionally perceived adversarial relationship between roads and water management (see box 8.1). Those principles are being mainstreamed in similar projects across the Africa Region (e.g., in Chad). Systematic mainstreaming can help achieve a resilient capital stock in rural transport.

In recent years, the GP has intervened on the policy level for road maintenance financing in African countries. Many countries finance road maintenance through second-generation road maintenance funds, which are inadequate in providing sufficient and consistent maintenance funding. Transport specialists have worked with other GPs, notably Governance, to integrate policy changes on maintenance funding into Development Policy Operations (DPOs). Cameroon is a notable example of a specific prior action on road maintenance in US\$150 million governance DPO approved in FY18, and the GP hopes to replicate this experience in other countries in Africa.



Tanzania boasts new, and greener public transport that cuts transportation costs and reduces traffic. (World Bank/Hendri Lombard)

Finally, the Transport GP is improving the collection and use of data in our projects in Africa. Top-down sources, such as remote sensing and in situ measurements, are seeing increased use in our projects, as will bottom-up data. It is hoped that in the medium term this will lead to better indicator design and outcome measurement, especially at the policy level.

### **Box 8.1 Mozambique Integrated Feeder Road Development Project**

The Mozambique Integrated Feeder Roads Development International Development Association (IDA) project of US\$150 million reflects the importance of climate mainstreaming to generate multiplier benefits to the economy and people. The project will enhance road access in the provinces of Zambezia and Nampula, where most of the country's rural poor households live; and where average farm income is three times lower than in the rest of the country due to poor rural access, among other factors.

About 6.5 million rural dwellers do not have access to a road in good or fair condition in Mozambique, and climate shocks and natural disasters exacerbate chronic low agricultural productivity. This project will target 10 districts in the Zambezia and Nampula provinces, which have high agricultural potential and a total population of around 2.2 million people, of which approximately 1.5 million live below the poverty line.

## 9. Social Development and Resilience

As the climate changes, millions of poor people throughout Africa will face greater challenges in terms of extreme events, health effects, food security, livelihood security, migration, water security, and cultural identity. Strengthening **social resilience**—the capacity for all members of society to thrive despite shocks, requires a strong focus on poverty reduction and addressing underlying causes of vulnerability. Governments will need to work at a scale greater than ever before and focus support for building resilience at the ground level where the effects are felt the most.

Key approaches that the Bank supports to strengthen social resilience include building adaptive social protection systems to protect the most vulnerable populations from climate shocks and changing trends, addressing the drivers and impacts of migration, and supporting community-led approaches that channel resources and decision-making power on risk management to communities.

### Context — Boosting Social Protection

Climate change and natural disasters disproportionately affect poor and vulnerable people who live in areas that are more exposed and vulnerable to shocks. Negative effects can be significant because poor households withdraw their children from school and sell productive assets. Social protection can increase the resilience of these households by helping them weather the negative effects of a shock and by extending a regular stream of support to improve the productivity of their economic activities or diversify their livelihoods.

The World Bank is supporting the expansion and strengthening of social protection systems to increase the resilience of poor and vulnerable groups to climate variability and change. It is also helping governments put in place mechanisms to scale up safety net programs to respond to climate-related shocks when they occur. It has allocated financing in response to shocks, particularly droughts, to allow governments to provide support to affected households through national safety net programs. Across Africa, the Bank is helping governments consolidate and strengthen the delivery of social protection systems, including by promoting adaptive social protection, which seeks to anticipate and respond to climate change. Adaptive social protection comprises flexible instruments that can protect poor households from climate and other shocks before they occur (through predictable transfers, community asset building, livelihood support, and other programs) and can scale up to respond to shocks and extreme events when they hit.

The expected outcome of this component of the Africa Climate Business Plan (ACBP) is an increase in the number of people covered by adaptive social protection programs across Sub-Saharan Africa. Progress was made in several areas, as summarized in table 9.1.

**Table 9.1:** Progress of World Bank Support for Social Protection Programs, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Support of activities that reduce sensitivity to climate-related shocks (soil conservation, watershed management, development of irrigation channels, water conservation, better cropping, enclosures, better food storage facilities, rainwater capture) Provision of analytical support and strategic engagement</li> <li>• Creation of registry systems to identify people at risk because of climate-related events</li> <li>• Establishment of early warning systems</li> <li>• Implementation of green public works, including soil conservation, watershed management, development of irrigation channels, water conservation, better cropping, enclosures, better food storage facilities, and rainwater capture</li> <li>• Provision of livelihood support, including by encouraging savings and disaster risk insurance, building household assets, preventing asset erosion as a result of drought through alternative sources of income, supplementing savings and income with grants to support investments in livelihoods, and reducing risk exposure</li> </ul>	<p>A total of 33 projects that directly contribute to the ACBP were approved or were in the process of being approved by the WBG Board. The value is estimated at more than US\$2 billion, financed by the IDA and trust fund resources, and greatly exceeded the targets set out in the ACBP, reflecting a growing demand for these services. The portfolio includes these and other adaptive elements:</p> <p>In Ethiopia, Kenya, Mauritania, Madagascar, Mozambique, Lesotho, Niger, Senegal, Uganda, and other countries, safety net programs have been scaled up to respond to shocks; these are based on early warning information ranging from the use of seasonal assessment and humanitarian appeals to the creation of new triggers based on data from satellites. The WBG works with humanitarian partners to harmonize approaches and build systems.</p> <p>In Madagascar, the Sahel, Tanzania, Ethiopia, Sierra Leone, and many other countries, the WBG supports livelihood activities to diversify, intensify, and expand productive activities that focus on climate adaptation.</p> <p>New registry systems (household registries) facilitate the quick identification and enrollment of households affected by climate change into safety net programs. In Senegal, a social registry is being developed to preregister the poorest and most vulnerable individuals.</p> <p>Public works programs (in Ethiopia, Niger, Madagascar, Tanzania, and elsewhere) focus on investments in landscape management (soil conservation, watershed management, reforestation, rehabilitation of eroded lands) through programs that plant trees, create soil bunds, terrace land, and create area enclosures, which have direct effects on climate mitigation.</p>
<b>Forward Look</b>	
<p>Africa recognizes the role of safety net programs in responding to shocks. During this reporting period, the Bank channeled funds from its Crisis Response Window through national safety net programs in Ethiopia, Kenya, Lesotho, Malawi, Madagascar, and Mozambique to respond to drought, delivering them through national safety net programs. See box 9.1 for an example. Ongoing technical assistance (TA) is helping governments identify and secure financing to scale-up safety nets. It includes work on macro-insurance, such as that offered to countries through the Africa Risk Capacity, contingency budgets, and instruments, including Development Policy Loans (DPLs) with Catastrophe-Deferred Drawdown Options (CAT-DDOs) and more traditional humanitarian financing.</p> <p>Efforts are underway in six countries in the Sahel to design, test, and pilot productive interventions that promote livelihood diversification. These are intended to raise household earnings and facilitate income-smoothing and resilience. See box 9.2 for a sample program in Ethiopia. A multicountry impact evaluation will generate rigorous results.</p>	
<b>Resource Mobilization</b>	
<ul style="list-style-type: none"> <li>• IDA target met with strong pipeline.</li> <li>• Need for continued resource mobilization.</li> </ul>	



## Box 9.1 Promoting Social Resilience through WACA

For vulnerable communities living along the coast of West Africa, the impacts of climate change are not only unavoidable but are already happening. Coastal erosion and flooding have affected the lives of about 13 million people in cities and villages in the coastal areas between Mauritania and Gabon in the past 17 years. During this period, 109 flood-related events in these countries killed more than 2,000 people. Millions have suffered detrimental impacts to their livelihoods. Hundreds of families are regularly forced to leave their homes due to coastal erosion and storm surges, and thousands more are facing the same fate.

The West Africa Coastal Areas (WACA) Platform and investment activities include a strong emphasis on engaging coastal communities in decision making to protect the rights of those affected by WACA activities and to partner with communities on sustainable solutions. In São Tomé and Príncipe, communities have asked for relocation assistance after recurrent storm surges washed away homes and assets and claimed lives. (See box 9.3.) WACA has supported planned relocation by working with four communities: identify those most at risk, identify safe land, and allocate plots in a safer area.

National and local leaders in other countries involved in WACA are asking for similar help. WACA Resilience Investment Project (ResIP) is supporting a process of community-led resilience planning, which, rather than provide prescriptive instructions, will walk stakeholders through the inputs needed to make decisions, the questions to consider regarding who needs to be involved, and how to assess and identify needed resources. From there, it will develop guidance around potential pathways. Where planned relocation is identified by communities as a viable option, WACA will support a participatory process for relocation planning and decision making. Past experiences have demonstrated the substantial challenges of moving people from vulnerable areas. It is a complex process fraught with social risk. There is much information to consider, and complex, deeply rooted issues related to people's livelihoods, culture, and identity. To have the best chance of success, communities and governments need to partner. WACA supports transparent processes and plans anchored in a long-term vision of inclusive, climate-resilience development. That way, communities are not relocating in a rushed, reactive manner after the trauma of loss of life, livelihoods, and assets.

In addition to citizen engagement, WACA promotes gender and social inclusion. The ongoing project activities are estimated to directly benefit approximately 200,000 people at project sites in six countries; they live along the coast and depend on it for their livelihoods. These people, including women, youth, elders, and other marginalized groups, are highly dependent on natural resources or ecosystem services that are increasingly being degraded. As a first step, the WACA ResIP program will develop a Gender Action Plan to ensure that women are both protected and empowered as resilience champions.

At the launch of the WACA Platform in November 2018 in Senegal, civil society and grassroots leaders, representing women, youth, elders, persons with disabilities, and other groups gathered to provide feedback on the platform. They suggested ways to engage civil society in decision making, awareness building of communities, and knowledge sharing. The WACA Platform will continue to work with civil society to design a platform that engages and responds to the needs of coastal communities.

## Box 9.2 Harnessing Mitigation Benefits through Social Protection

Ethiopia's Productive Safety Net Program (PSNP) integrates cash and food transfers in exchange for labor on public works to reduce short-term poverty as well as long-term dependence by investing in the productive capacity and resilience of communities. Using this approach, Ethiopia has embarked upon an ambitious national program of land restoration and sustainable land management since 2005. Although the intent was to reduce poverty, a recent analysis shows that an unintended co-benefit is the climate change mitigation from reduced greenhouse gas (GHG) emissions and increased landscape carbon stocks. The total reduction in net GHG emissions from PSNP's land management at the national scale is estimated at 3.4 million Mg CO<sub>2</sub>e y<sup>-1</sup>, or approximately 1.5 percent of the emissions reductions in Ethiopia's Nationally Determined Contribution (NDC) for the Paris Agreement. (Woolf, Solomon, and Lehmann 2018)



## Future Opportunities

Social protection can help to respond to climate-related shocks, particularly drought, both in terms of adaptation and mitigation. Further innovations in crafting mechanisms that can scale up these systems and develop innovative means of financing responses, beyond the current reliance on humanitarian funding, are necessary and expected.

Countries are concerned about marginalized people and their lack of access to economic inclusion. An increasing number of countries are promoting productive inclusion of safety net beneficiaries and beyond to build their resilience to climate change and long-term local development.

## Context — Addressing the Drivers and Impacts of Migration

Climate change is expected to affect all forms of mobility in Africa—internal and cross-border, short and long distance, temporary and permanent, voluntary and forced. Negative impacts could affect millions of poor people. Africa is home to more than 18 million forcibly displaced people—more than a quarter of the global total. Climate change is emerging as a potent driver of migration. Groundswell: Preparing for Internal Climate Migration (Rigaud et al. 2018) projects that, by 2050, without concrete climate and development action, just over 143 million people—or around 3 percent of the population across Sub-Saharan Africa, Latin America, and South Asia—could be forced to move within their own countries to escape the slow onset impacts of climate change.

In Sub-Saharan Africa, “internal climate migrants” could reach more than 85 million, representing up to 4 percent of the Africa Region’s total population, unless concrete climate and development actions are taken. Climate migration can have substantial development implications, and the stakes are high. Achieving a resilient society—in which people can either adapt in place and thrive or migrate with dignity toward areas of higher opportunity—is an important part of meeting national development goals.

The steady increase in conflicts that spill over borders and the intensifying impacts of climate extremes are increasing these numbers. The growing number of people on the move is straining current systems and will have long-term impacts on host countries. Influxes of migrants could undermine and reverse much of the development progress achieved in the past two decades.

The World Bank continues to work with partners to deliver key knowledge products, innovative joint operations, and knowledge exchanges to strengthen social and economic resilience in rural and urban spaces. A critical aspect of social resilience is understanding and addressing the multiple drivers of migration and their interactive effects with other sources of vulnerability. This includes developing a better understanding of the conditions that lead to migration, and how mobility can be a positive adaptation strategy. Progress has been made in several areas, as summarized in table 9.2.

**Table 9.2:** Progress of World Bank Support for Addressing Drivers of Migration, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Develop strategic operations or components in ongoing operations in the Lake Chad Basin and the Horn of Africa</li> <li>• Build the evidence base and establish a knowledge partnership</li> <li>• Pilot and promote innovation on mixed migration (complex population movements, including refugees, asylum seekers, economic migrants, and people displaced by natural disasters or climate change)</li> <li>• AFCC2/RI-GLR—Displaced Persons and Border Communities in Djibouti, Ethiopia, and Uganda (P152822) project, US\$20 million. Activities include social and economic services and infrastructure; sustainable environmental management; and a livelihoods program</li> <li>• Kenya Somalia-HOA: Support to FD Impacts, Eastern Africa (P161067). The project addresses the needs of forcibly displaced people from Somalia and other countries and the Kenyan host communities in Turkana, Wajir, and Garissa counties with the following components (more than 1 million beneficiaries): (i) social and economic infrastructure and services (education, primary and secondary health services, water supply, sanitation, and hygiene using community-driven development [CDD] approach); (ii) environmental and natural resource management by restoring the environment through tree planting, rainwater harvesting, waste management; improving access to energy in the form of environmentally friendly, alternative sources of household energy; and improving livelihood opportunities, such as crop and livestock and skills training; (iii) project management; and (iv) IGAD support</li> <li>• Central African Republic—Displacement Project (P161591). This project caters to displaced and host communities, about 190,000 beneficiaries in total, 50 percent of them women. Component 1 provides access to basic services and infrastructure; component 2 finances safety nets; and component 3 supports community mobilization, capacity building, and TA.</li> <li>• Zambia—GLR Displaced Persons Project (P163895) AF supports the following components to (i) improve access to livelihoods and socioeconomic infrastructure for displaced people and host communities in target areas of the territory of the Zambia; and (ii) support regional learning on development responses to forced displacement.</li> <li>• The pipeline Burundi Refugees: GLR-SOP BI Component (P164124) is expected to support socioeconomic infrastructure (e.g., schools, health clinics) and agropastoral production for refugees and host communities.</li> </ul>	<p>Several large operations, with financing of more than US\$300 million, were approved for Kenya, Uganda, the Great Lakes, and regional (DRDIP in Ethiopia, Uganda, Djibouti) projects to address the impacts of forced displacement and migration.</p> <hr/> <p>Additional Financing of US\$8.18 million for the Kenya DRDIP through an MDTF with Danish trust funds augments core investments. Additional financing of US\$150 million for Uganda includes investments across refugee hosting districts and with investments in natural resource management and a proposed Displacement Crisis Response Mechanism to ensure resilience of hosting communities impacted by an influx of refugees beyond a predefined threshold. Some have received additional financing to augment core investments.</p> <hr/> <p>Smaller targeted projects include a US\$3 million grant to the IGAD to set up the Regional Secretariat on Forced Displacement and Mixed Migration, targeting inclusive community resilience and gender-based violence (Somalia) as well as adaptation measures (São Tomé and Príncipe).</p>

### Forward Look

- Flows of forcibly displaced people continue to increase.
- The Horn of Africa, the Great Lakes region, the Lake Chad region, and the Sahel are areas that continue to experience high flows of displaced people; providing longer-term development solutions and transitioning from emergency assistance are having a transformative impact.

An additional long-term challenge is to address the need for mobility as an adaptation strategy. The Bank's Groundswell flagship report (Rigaud et al. 2018) underscores upward climate migration trends with targeted climate action and concrete social and economic development. In-depth analysis for Lake Victoria and West Africa will inform policy dialogue and action. Ongoing efforts on planned, voluntary relocation in São Tomé and Príncipe are providing critical lessons for other communities and countries, particularly WACA countries.

### Resource Mobilization

Targets are on track, but low, which may in part be due to overlaps with social protection delivery.

### Box 9.3 Anticipatory Planning and Relocation in Response to Climate Risks

In São Tomé and Príncipe, communities have asked for relocation assistance after recurrent storm surges washed away homes and assets and claimed lives. A pilot program for voluntary relocation is working with four communities and will be scaled up to include others. The pilots start with participatory risk and vulnerability mapping to identify who is most at risk and needs to move. Land has been identified, and plots are being allocated, with communities driving the process. To prevent people from returning to the vulnerable areas, and to ensure that the new, safer location attracts more people, the government is planning to invest in the new areas to make them growth poles for the future.

### Reflections and Future Opportunities

Djibouti and Uganda, as well as neighboring Ethiopia, will likely be affected by the near doubling of the population (Rigaud et al. 2018, 142). Providing longer-term development solutions and transitioning from emergency assistance is having a transformative impact. Experience has shown that when communities see that refugees have the opportunity to contribute to development, and when host communities are supported, there are long-term benefits for all. As Bank operations in this area grow, it will be important to monitor impacts and share learning.

A long-term challenge is to address mobility as an adaptation strategy. The Bank is analyzing migration trends due to climate change, which will inform dialogue with low-income countries (LICs) on how migration can be a positive adaptation mechanism and a contributor to social and economic development.

The ongoing efforts on planned, voluntary relocation in São Tomé and Príncipe are critical lessons, informing the development of a framework to guide the decision making and implementation process to support other communities facing voluntary relocation. The framework is part of the WACA ResIP, which covers Benin, Cameroon, Cape Verde, Côte d'Ivoire, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Nigeria, São Tomé and Príncipe, Senegal, Sierra Leone, and Togo.

The framework is being developed with WACA countries to ensure that relocation is a pro-poor, people-centered process in which communities drive the decision making. It promotes a clear understanding of the social risk involved, in addition to transparency and accountability to stakeholders. The complexity of this task cannot be understated. Relocation is an inherently disruptive experience, upending livelihoods, social networks, ways of life, and cultures. However, if planned carefully in advance, with the affected communities driving the decision making, it can be a potentially important opportunity for inclusive and resilient development planning.

## 10. Renewable Energy in Africa

The energy sector landscape in Sub-Saharan Africa is changing rapidly. Progress in modern energy service provision has become tangible for many households and businesses as accelerated energy infrastructure investment in recent years is bearing fruit. New technologies are transforming the way energy services are provided, with a larger role for renewable energy and private, sector-based service delivery. Governments are increasingly tapping into new sources of financing to fund energy infrastructure investment. However, despite these significant achievements, huge challenges remain.

The drastically reduced price of renewables, especially solar power, has accelerated the global sustainable energy transition. The region has abundant renewable energy resources, including hydropower, natural gas, solar, wind, and geothermal. With more than 1,000 gigawatts of potential, solar and wind energy represent one of the most promising drivers for green growth, followed by hydropower (283 gigawatts of potential) and geothermal energy (15 gigawatts of potential). Sharp declines in cost have accelerated investments in utility-scale renewable energy, and further advances in storage will facilitate its integration into power grids. Investments in gas-to-power have picked up over the past decade, pushing out more polluting resources. As a result, the continent is on track to avoid a lock-in into coal and other high-polluting energy resources. Renewable production has increased by 6,002 gigawatt-hours in the region during the most recent 10-year period.

The Bank has been instrumental in Africa's energy transition to renewable energy. It has provided direct financing and risk guarantees for solar, hydro, and geothermal power generation projects in Africa, putting the Bank on track to achieve renewable energy targets committed in the Africa Climate Business Plan (ACBP).

Africa's climate-smart development needs more than renewables. Governments need to effectively plan a generation mix to optimize cost and climate impacts, as well as to ensure that power utilities are financially viable to be a creditworthy off-taker for private renewable power generation. Regional power interconnections need to be strengthened to enable low-cost renewables. The Bank is supporting client governments in Africa to address these broader sector challenges.

Access to energy enhances Africa's resilience to climate change. It improves people's livelihoods and supports income generation through productive use of electricity. Under the framework of Sustainable Energy for All, the Bank is supporting client countries to achieve universal access to energy by 2030 through both on-grid and off-grid means. Energy access strengthens people's capacity to adapt to economic and climatic challenges, thereby enhancing people's resilience to climate change.

The Bank anticipates a growth in engagements with African governments, the private sector, and civil society to help significantly increase the integration of renewable energy into the

supply mix and reduce the need for countries to get locked-in into fossil fuel solutions for their electricity supply. In 2018, there has been the development of more flexible power systems, with the addition of different forms of electricity storage and grid management technology. In addition, market reforms optimized investments and expanded markets toward multiple solutions to address sustainable and reliable energy access in almost all African countries, supported, and often led by, the World Bank and other development partners.

## Increasing the Use of Solar Power

Africa is benefiting from the falling price of solar photovoltaics (PV) and associated storage equipment. Grid-connected solar is one of the lowest-cost generation options in many countries. There is also significant private investment flowing into off-grid solar energy. See table 10.1 for a summary of World Bank support for solar power. See box 10.1 for a case study.

**Table 10.1:** Progress of World Bank Support for Solar Power, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>Engagement in sector dialogue and policy support, including of regulation, taxation, and subsidies</li> </ul>	<p>The WBG is on track to achieve the short-term target of supporting 1 GW of grid-connected solar by 2023. Between FY16 and FY18, the WBG has approved lending for six grid-connected solar projects in five countries (Burkina Faso, The Gambia, Mali, Senegal, Zambia) and West African Power Pool (WAPP) in the amount of US\$80 million. The total solar generation capacity through these operations is 650 MW. With the existing portfolio and projects in the pipeline, the target is likely to be achieved ahead of 2023.</p>
<ul style="list-style-type: none"> <li>Provision of technical assistance, including for planning, solar resource mapping, transaction structuring, and electricity grid integration</li> </ul>	<p>In Zambia, the first 47.5 MW solar PV at the West Lunga site (approved by the WBG Board in FY17) was developed using the Scaling Solar Initiative, and construction has started. In Senegal, through the Scaling Solar Initiative, a tariff of US cents 4.9 per KWh has been achieved through transparent and competitive auction.</p> <p>Between FY16 and FY18, 10 projects approved by the WBG Board had significant solar off-grid (mini-grid and solar home systems) components.</p>
<ul style="list-style-type: none"> <li>Provision of guarantee packages and lending for public investment, public-private partnerships, and debt facilities</li> </ul>	<p>The WBG approved electricity access projects with significant off-grid components (including both mini-grids and solar home systems) in Ethiopia, Kenya, and Nigeria. The off-grid components in these operations, totaling US\$325 million, are expected to provide off-grid electricity services to an estimated number of 922,000 households in Africa. As the subsector matures, there is likely to be an increased investment.</p> <p>Outside the lending operations, WBG/ESMAP have launched the Global Solar Atlas, providing a public resource to guide solar development in Africa and elsewhere. The WBG has led Lighting Africa and Lighting Global programs that support the scale-up of solar home systems.</p>

### Forward Look

Due to the falling cost of solar PV and successful cases of solar auctions in Sub-Saharan Africa, there is increasing demand for the Bank to support grid-connected PV electricity expansion as a solution to reduce dependency on fossil-fuel thermal electricity generation. Preparation has started on at least eight grid-connected solar projects, in Burundi, the Central African Republic, Comoros, Ethiopia, The Gambia, Madagascar, Niger, and Togo; and there will be an expansion of battery storage tied to PV electricity generation.

There is also a strong momentum for scaling up off-grid electrification technologies, including solar home systems and mini-grids. Most of the electricity access projects recently approved by the Bank have integrated off-grid components. The Bank is preparing a regional project in West Africa to support an enabling environment for private solar off-grid solution in the region.

### Resource Mobilization

- International Development Association (IDA) target has exceeded expectations.
- Good pipeline and opportunities.
- Continued need for resource mobilization

## Box 10.1 Global Solar Atlas

The Global Solar Atlas provides quick and easy Internet access to solar resource data.<sup>a</sup> Data on all the key solar resource parameters are provided at 1-kilometer resolution, and users can download poster maps and Geographic Information Systems (GIS) data for free. Since its launch by the World Bank in January 2017 (with funding by ESMAP), the Global Solar Atlas has become a popular tool, with an average of 12,500 unique users a month as of November 2018, of which 32 percent are returning visitors.

The Global Solar Atlas shows the locations of ESMAP-funded solar measurement campaigns, including those carried out in Malawi, Tanzania, and Zambia. During FY18, ESMAP completed a pilot in West Africa and India to assess the potential for floating solar on existing hydropower sites; these data are now available. A new version of the Global Solar Atlas is in development to enhance the data and provide new functionality and tools.

The Global Solar Atlas was joined by the improved Global Wind Atlas<sup>b</sup> in late 2017 and is part of the World Bank–hosted collection of energy data and visualization tools.<sup>c</sup>

a. See the Global Solar Atlas website at <http://globalsolaratlas.info>.

b. See the Global Wind Atlas website at <https://globalwindatlas.info>.

c. See the World Bank website at <https://energydata.info>.

## Lessons Learned and Challenges Faced

The financial viability of the sector is crucial to attract reputable investors for grid-connected PV and achieve a low-cost solar tariff. As many countries in the region scale up their solar PV generation, strengthening and optimizing the grid operation to cope with the variability of solar will be important. Grid codes need to be adopted systematically in every country to absorb variable renewable electricity. Significant investment on dispatch infrastructure is needed to enable instantaneous adjustments.

Access to affordable working capital to off-grid solution providers is a key bottleneck. Many Bank-funded projects support the working capital provision through establishing credit facilities. For mini-grid solutions, the public sector cost buy-down is typically needed to maintain affordable tariffs to end users. Nonetheless, the private sector operates an increasing number of mini-grids. The Bank is supporting National Electrification Strategies based on GIS-powered geospatial planning to integrate solar off-grid technologies in the region.

## Increasing Hydropower Use

Hydropower is one of the largest sources of electricity in Sub-Saharan Africa. Many countries rely on it as the primary source of electricity. It also helps to stabilize the power system when other variable renewable energy is integrated into the grid. However, hydropower is subject to vulnerability arising from climate change and associated hydrological risks. Well-considered planning is needed to avoid power crises resulting from extreme climate events such as drought and floods.



The World Bank is seeking to help increase the share of hydropower in the region's electricity mix from 24 percent to 40 percent. It is focusing on developing midsize and large hydropower capacity and regulating water. The fast-track target of this initiative aims to raise US\$1,208 million by 2020. This resource mobilization is expected to implement of 420 megawatts of low-cost hydropower in West Africa by 2023. Nine projects to help increase the use of hydropower in the region were approved in FY16 and FY17, for a total US\$776 million of IDA resources. Progress was made in several areas, as summarized in table 10.2. See details on the Cameroon Nachtigal Hydropower Project in box 10.2.

**Table 10.2:** Progress of World Bank Support for Hydropower, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Providing guarantee packages for large-scale hydropower projects</li> <li>• Financing governments to construct small hydroelectric plants</li> <li>• Supporting upstream activities to identify, prepare, and design hydropower projects</li> </ul>	<p>The WBG approved 10 projects, which included support for hydropower development at a total scale of 460 MW. The largest project was the Nachtigal Hydropower Project in Cameroon, with a capacity of 420 MW. The remaining 60 MW are from small hydro projects at various stages of development.</p> <hr/> <p>With pipeline projects in Malawi and Sierra Leone totaling 448 MW, the WBG should be meet the target of supporting 1 GW by 2026.</p>
Forward Look	
<p>Considering increasing development of variable renewable energy, complementary services provided by hydropower should be further analyzed and enhanced in upcoming projects. Ancillary services and flexibility brought by hydropower are crucial to stability of energy systems. On that basis, support to the development of the energy market and remuneration for ancillary services could be further enhanced in coming initiatives. During planning and least-cost exercises, the energy sector may not want to compare levelized costs of energy between energy alternatives, since this simplistic method may hinder ancillary services provided by hydropower.</p>	
Resource Mobilization	
<ul style="list-style-type: none"> <li>• IDA target has exceeded expectations.</li> <li>• International Bank for Reconstruction and Development (IBRD) has been leveraged.</li> <li>• Continued need for resource mobilization.</li> </ul>	

### Box 10.2 Cameroon Nachtigal Hydropower

The Bank, the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency supported the private sector-led Nachtigal Hydropower Project (P157734) in Cameroon. By linking reforms, investment, mobilization, and catalytic action, the project promotes the judicious use of scarce public and concessional resources, crowds in commercial capital, and minimizes the public debt burden. This hydropower project is a good demonstration of the principles for Maximizing Finance for Development (MFD): it is not only crowding in private capital and reducing public debt but also lowering the overall costs of service for electricity and enabling the country to meet its energy demand and ambitious targets. This represents one of the few public-private partnerships in hydropower in Sub-Saharan Africa and sets the standard for other similar investments in the country and elsewhere.

## Future Opportunities

The Bank will implement several ongoing hydropower initiatives and identify new schemes in the coming year. Opportunities include projects that (i) support regional power integration; (ii) reform water regulation to ensure year-round production which can catalyze the deployment of hydropower; (iii) increase private sector access to working capital for hydropower project developers; (iv) investigate the complementary development of hydropower with solar to maximize the synergies between the two technologies (because hydropower provides flexible regulation and ancillary services needed to increase the use of solar power); (v) explore complementarity with other water uses and purposes (flood protection, water supply, irrigation) to integrate the development of dams and hydropower; and (vi) look for ways to enhance agile practices and programmatic and risk-based approaches in the sector.

## Lessons Learned and Challenges Faced

- A key lesson from the preparation of Nachtigal Hydropower Project in Cameroon is that a hydropower project needs a long-term prior involvement and commitment with the country energy sector.
- One of the key challenges to hydropower development requires addressing negative publicity, misconceptions, and fear around hydropower and dams' development. Environmental and social aspects of projects are a key pillar to be carefully managed and implemented, as per good international practices. A sophisticated communications strategy enhancing social and economic benefits of hydropower project can support these objectives.
- Decision makers need to be supported to develop an understanding of key leverage and factors that will pave the way to successful preparation and implementation of projects.
- Mobilization of transactions, with technical and financial advisors to governments and utilities, should be enhanced, in particular in the event of unsolicited proposals and direct agreements with developers.
- As per solar sector, auctions for hydropower should also be supported in order to foster transparency and competitive power purchase agreements.

## Increasing Geothermal Power Use

Geothermal energy is one of the few renewables that can function as the baseload without significant output variation (e.g., as with solar and wind energy). Kenya and Ethiopia have the largest geothermal resource endowments in the region, but other countries are exploring geothermal development, too. A key challenge is the significant resource uncertainty, which requires costly test drilling to confirm the economic viability. The Bank's support has focused on sharing the risk of such upstream exploration.

The World Bank seeks to help deploy thermal power in Sub-Saharan Africa by reinforcing the upstream development of geothermal sites to attract private investment in downstream development. These efforts will help scale up the sector in East Africa, in which just 1.5 percent (209 megawatts) of the estimated 14,000 megawatts of geothermal potential is being harnessed. The fast-track target of this initiative aims at raising US\$950 million by 2020, US\$500 million of it from IDA. This resource mobilization is expected to enable

implementation of 150 megawatts of geothermal generation capacity. Progress was made in several areas, as summarized in table 10.3.

**Table 10.3:** Progress of World Bank Support for Geothermal Energy, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Provision of technical assistance</li> <li>• Provision of lending for public investment in exploration and development and public-private partnerships for downstream development</li> </ul>	<p>In 2016, the WBG approved a project that included US\$53.2 million to support the cost overrun of geothermal plants in Kenya (Olkaria I and IV, which totaled 280 MW). This constitutes important progress toward the target of supporting 500 MW by 2026.</p> <p>In Ethiopia, geothermal drilling at the Aluto Langano site was delayed but is now progressing. The WBG is supporting Ethiopia to develop its internal capacity for geothermal development through south-south knowledge sharing.</p> <p>Technical assistance work for geothermal development, such as surface exploration, is ongoing in Malawi, Tanzania, and Uganda.</p> <p>There was no new geothermal project in FY18.</p>
<b>Forward Look</b>	
<p>Several countries in East Africa are in the reconnaissance and early exploration phase with no investment projects identified in the near term. The Bank's support has focused on sharing the risk of such upstream exploration.</p>	
<b>Resource Mobilization</b>	
<ul style="list-style-type: none"> <li>• Slow progress.</li> <li>• Reconnaissance and exploration work continues.</li> </ul>	

### Lessons Learned and Challenges Faced

Due to uneven geothermal resource endowments in Africa, building a pipeline for geothermal projects has been a challenge. Geothermal resources suitable for power production, using conventional technology, have currently not been confirmed outside of Kenya and Ethiopia. Other countries in East Africa are in the reconnaissance and early exploration phase with no investment projects identified in the near term. Kenya generates a substantial share of its power by geothermal energy, with a number of new generation projects in the pipeline. Kenya may not have much need for additional geothermal baseload electricity generation capacity in the medium term. In Ethiopia, the geothermal sector has developed more recently than in Kenya; domestic technical capacity for geothermal development will need to expand to enable an acceleration of investment projects.



Thirty-two million Africans have access to electricity due in part to World Bank initiatives. (World Bank/Arne Hoel)

# 11. Strengthening Africa’s Hydrometeorological Program

## Context

The World Bank is supporting the enhancement of climate- and disaster-resilience capacity in Sub-Saharan Africa by strengthening countries’ weather, water, and climate (hydromet) services, including early warning, knowledge, and advisory services, and linking national systems with regional and global counterparts. Its program aims to strengthen national meteorological and hydrological services by providing the infrastructure, technical assistance, and capacity-building operations needed for integrated modernization. It facilitates horizontal integration of national hydromet services with users and vertical integration of national hydromet services with regional climate centers and global centers of excellence in a manner compliant with the Global Framework of Climate Services and the Cascading Forecasting Process.

Phase I of the Africa hydromet program will benefit more than 100 million people in 15 countries in Sub-Saharan Africa and four regional organizations. It is building the technical, human, and financial capacity to provide forecasts, warnings, and value added climate information services and products. It will enhance resilience to climate and disaster risks and augment the capacity to adapt to climate variability and change. Major climate-resilience benefits include reduction of climate and disaster risks and impacts, improved disaster preparedness, and enhanced resilience of social and productive infrastructure. Progress was made in several areas, as summarized in table 11.1.

**Table 11.1:** Progress of World Bank Support for the Hydromet Program, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>Strengthening of NMHS, by improving its ability to deliver services, building capacity, and supporting policy and institutional reforms</li> </ul>	<p>By the end of FY18, the WBG’s active commitments in the Africa hydromet program stood at US\$230.1 million, a US\$33.5 million increase over the previous year, with support from the IDA, GCF, GFDRR, GEF, and CREWS. Investment and technical assistance operations were being implemented in 19 countries (Botswana, Burkina Faso, Chad, Congo, Dem. Rep., Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Niger, Nigeria, Rwanda, Senegal, Tanzania, Togo, Uganda, and Zambia).</p>
<ul style="list-style-type: none"> <li>Modernizing regional NMHS centers, including through the fostering of cooperation with national institutions</li> </ul>	<p>GFDRR grants to support coordination of the Africa hydromet program partnership convened by the Bank were used to organize deep dive meetings of program partners (WBG, WMO, AfDB, UNDP, ADF, and WFP) in Tokyo in September 2016; in Washington, DC, in December 2016; in Saly, Senegal, in May 2017; and in convening the Africa Hydromet Forum in Addis Ababa, co-hosted by the African Union Commission and the Government of Ethiopia in September 2017.</p>
<ul style="list-style-type: none"> <li>Integrating national, regional, and global systems and knowledge and advisory services</li> </ul>	

**Table 11.1:** Progress of World Bank Support for the Hydromet Program, June 2018 *(continued)*

Phase I of the hydromet program will be presented for the consideration of the Green Climate Fund (GCF) on a country-by-country basis in addition to leveraging International Development Association (IDA) financing both from national and regional windows, and from the Climate Risk Early Warning System (CREWS). The program will seek funding for regional climate centers. The portfolio at present has more than 10 countries from Sub-Saharan Africa, and a score of other countries and regional entities have expressed serious intent to join. However, the limits of IDA financing, which would act as the catalyst in crowding in other financing from GCF, CREWS, and other sources, have defined the constraints on optimum outcomes from the portfolio. In addition, certain country operations have been integrated into a regional operation for West Africa, leading to a reorientation of project preparation and causing some time overruns. The synergy and complementarity of national and regional actions for holistic modernization of hydromet services and systems have led to the amalgamation of some country operations into the larger regional operation.

The lessons learned from these recent trends are that (i) a special consideration for hydromet modernization may remove the natural disadvantage of climate adaptation operations due to the relatively smaller size of the operation; (ii) greater ownership from country management units may be achieved through higher sensitization of the units; and (iii) the project preparation cycle of hydromet modernization projects is technically complex and involves multiple agencies in country and across the regions. This may be acknowledged upfront in country and regional operations, rather than an attempted oversimplification of project designs, to achieve limited results under the projects approach. Another lesson is that it is alluring to select the low-hanging fruits of hydromet value chain in hydrology, agrometeorology, or earth observation. But partial or selective treatment of some aspects of hydromet modernization has never been sustainable and should be avoided. The temptation of preferring quick-and-dirty and cheap substitutes that are unreliable or unviable alternatives to holistic modernization of national systems and services should be strongly countered. Planners should avoid the tendency to include simple and quick components of the hydromet value chain, while conveniently ignoring the complex and interdependent value chain of hydromet and early warning services.

The program expects to receive funding from the GCF for the regional hydromet operation in West Africa; appraise and bring projects for West Africa to the World Bank Board; seek funding for regional organizations in the Sahel; and prepare feasibility studies for developing investment operations in other countries that have expressed strong demand. The Burkina Faso hydromet project is expected to be submitted for the Board's consideration in September 2018. The US\$31 million project, co-financed by the GCF (US\$22.5 million) and the IDA (US\$8.5 million), will support key producers and users of hydromet services, including the meteorological service, the National Directorate for Water Resources, the food security early warning system, and the Directorate General for Civil Protection. The West Africa Hydromet Modernization Project is expected to be presented to the Bank Board in FY19.

#### Resource Mobilization

- Progress underway toward target.
- Good pipeline.

IDA funding is leveraging contributions from GCF, the GEF Least Developed Countries' Fund (GEF LDCF), the Global Facility for Disaster Reduction and Recovery Africa Caribbean Pacific–European Union Natural Disaster Reduction (GFDRR ACP-EU NDRR) Program, the Climate Investment Fund Pilot Program for Climate Resilience (CIF PPCR), and the Climate Risks Early Warning Systems Initiative (CREWS).

GFDRR<sup>12</sup> grants support coordination of the Africa hydromet program partnership convened by the Bank. They have helped to organize deep dive meetings of program partners (the World Bank, the World Meteorological Organization (WMO), the African Development Bank (AfDB), the United Nations Development Programme (UNDP), the French Development Agency (ADF), and the World Food Programme) in Tokyo in September 2016; in Washington, DC, in December 2016; and in Saly, Senegal, in May 2017. Grants have helped organizers convene the Africa Hydromet Forum in Addis Ababa, co-hosted by the African Union Commission and the Federal

12 See the Prevention Web website, GFDRR web page, <https://www.preventionweb.net/organizations/3388>.





A critical hydropower plant brings energy to Mali. (Sarah Farhat)

Government of Ethiopia, in September 2017. Subregional Hydromet Forums have met at the Economic Community of West African States (ECOWAS) level (September 2018) and the Economic Community of Central African States (ECCAS) (November 2018). The Southern African Development Community (SADC) and the Intergovernmental Authority on Development (IGAD) convened their respective hydromet forums in the fiscal year. The Second Africa Hydromet Forum at the continental level is being planned for October 2019 at the African Union Commission headquarters in Addis Ababa.

The CREWS Initiative allocated US\$2.5 million to the Democratic Republic of Congo, US\$2.75 million to Mali, and US\$2.5 million to Niger for technical assistance. The resources are to be used to guide the countries in optimally using GEF, GCF, and IDA resources during implementation; developing cross-cutting decision support tools based on hydromet information; and making decisions about food security, agrometeorology, civil protection and early warning, and institutional strengthening.

In Burkina Faso, a funding proposal was approved by the GCF in March 2018. The US\$31 million project will be co-financed by the GCF (US\$22.5 million) and IDA (US\$8.5 million). It will support key producers and users of hydromet services, including the meteorological service, the hydrological service, the food security early warning system, the Directorate General for Civil Protection, and the national disaster risk reduction institution.

The Bank prepared a similar feasibility study for hydromet and early warning services modernization for Chad and Togo. Chad, Togo, and Mali operations are under preparation under the regional operation for hydromet modernization in West Africa.



# 12. Establishing an Africa Climate Resilient Investment Facility

## Context

Climate change and climate shocks are expected to hit hardest in Africa. The Africa Climate Resilient Investment Facility (AFRI-RES) was established to strengthen the capacity of institutions (including national governments, river basin organizations, regional economic communities, and power pools) to plan, design, and implement investments in selected sectors to increase their resilience to climate change. The facility is a collaborative effort between the World Bank, the African Union Commission, the United Nations Economic Commission for Africa (UNECA), and other partners in Africa.

Expected outcomes include the development and application of robust technical guidelines for investment planning and design under climate uncertainty, establishment of an open data and knowledge platform for use in climate-resilient project design, strengthened capacity of project developers in the use of methodologies for managing climate risks in the planning and design of projects in key sectors, and delivery of technical advisory services to project developers at critical junctures in the project design process. Progress is summarized in table 12.1.

AFRI-RES will support development of approaches that help understand climate risks, including the use of credible information and appropriate modeling tools to prepare Africa

**Table 12.1:** Progress of World Bank Support for AFRI-RES, June 2018

Activity	Progress
<ul style="list-style-type: none"> <li>• Creation of an open data and knowledge platform</li> <li>• Development of guidelines for climate-resilient investment planning</li> <li>• Compilation of good practices in the operation of climate-vulnerable infrastructure</li> <li>• Planning and implementation of awareness-raising activities</li> <li>• Provision of on-demand advisory services to project developers</li> </ul>	<p>ACRIS III was held in Morocco in February 2018 with more than 250 public and private sector participants.</p> <p>The annual work program was developed and endorsed during the First Leadership Group meeting.</p> <p>TA support was provided, totaling US\$1.05 million, to 14 projects from seven GPs for the integration of climate risks into project design; and knowledge generation for broader outreach and dissemination.</p>
<b>Forward Look</b>	
<p>Develop good practice and guidelines for resilient planning for specific sectors and themes. Support knowledge forums and dissemination. Support ACRIS. Increase resource mobilization to close the funding gap (US\$50 million target by 2020).</p>	
<b>Resource Mobilization</b>	
<ul style="list-style-type: none"> <li>• Work commenced with partners.</li> <li>• Resource mobilization continues.</li> </ul>	



Women sell pineapple on the roadside in Kindia, Guinea. (World Bank/Vincent Tremeau)

for the impacts of climate change and disaster risk reduction. Climate risk management informs the planning and design across different sectors and stages of decision making (e.g., from policy-level to sector-level planning to individual project design). Delivery includes project-level TA; outreach, dissemination, and training; development of guidelines, standards, and good practice notes for climate-resilient infrastructure investment; and the launching of an online climate knowledge and data portal.

## 13. Promoting Climate-Smart Healthcare

### Context

Climate change is the greatest global health threat of the 21<sup>st</sup> century with far-reaching consequences for human capital accumulation, labor productivity, and development (IPCC 2018). Through direct (e.g., floods) and indirect (e.g., social determinants) pathways, climate change significantly contributes to the number of people suffering from injuries, undernutrition, vector-, food-, and waterborne diseases (e.g., malaria, dengue, diarrhea, schistosomiasis), heat stress, and premature death.

Sub-Saharan Africa is vulnerable to climate change health impacts because of three key challenges: (i) location and environmental characteristics; (ii) existing development challenges (e.g., highly variable food security, substandard water supply and sanitation infrastructure, fragile health systems, and wide-ranging socioeconomic and governance challenges (USAID 2017), which compound predicted impacts of climate change; (iii) lack of community-level capacity to respond or adapt to impacts of climate change, including low access to essential health services. Under these conditions, the region is projected to see an exponential rise in its already high health burden, particularly those related to undernutrition, infectious and chronic diseases, disaster risks, and pandemic threats. Moreover, catastrophic costs due to climate-related health shocks could push millions of Africans into further poverty.

Table 13.1 summarizes the World Bank's strategy to support African countries in mitigating the health impacts of climate change by moving toward the achievement of low-carbon and climate-resilient health systems (i.e., climate-smart healthcare) by 2030. This strategy will be achieved through the attainment of three objectives defined by the Health, Nutrition, and Population (HNP) Global Practice (GP). Support will be directed toward 20 high priority (HPC), 19 moderate priority (MPC), and five low priority (LPC) African "hotspot" countries<sup>13</sup> (table 13.1). This plan will be adjusted as countries and financing agencies learn how to best approach these challenges together. World Bank plans to contribute to that learning through its Advisory Services and Analytics (ASA) program and its operational experience, including ongoing World Bank-financed projects to refine tools and techniques to meet the climate and health challenges in the region.

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13 Hotspot countries are African countries that already experience or are likely to experience a change in the burden of disease due to the impacts of climate change.



**Table 13.1:** Support to HNP Programs

**HNP Climate and Health Strategic Objectives**

- Strengthen regional, national, and local institutional capacity for climate change adaptation and mitigation.
- Implement climate adaptation and mitigation action.
- Scale up investments to address climate change.

Anticipated outcomes include the following

- Understand country-specific health and health system risks associated with climate change.
- Plan using evidence-based policy for health sector adaptation and mitigation to climate change.
- Strengthen adaptive and resilience capacity at the regional, national, and local levels to enable African governments to prepare for, and effectively respond to, climate change threats to human health.
- Expand advocacy and deepen partnerships at a regional level, and strengthen intersectoral governance and collaboration at the national level.
- Implement and successfully scale-up climate-sensitive public health and environmental interventions by regional bodies and relevant national governments, building upon already existing public health and environmental programs, and promoting active involvement of local communities.
- Increase investments in, and implementation of, low-carbon strategies at a regional and national level.

**Table B13.1.1 Expected Outcomes of World Bank Support for Climate-Smart Health Programs**

Activity	Expected outcomes		
	Fast track (by 2023)	Long term (by 2026)	Longer term (by 2030)
• All IDA/IBRD countries conduct comprehensive climate change and health diagnostics, including an assessment of the climate resilience of the health system	• Complete climate change and health diagnostics and resilience assessments of the 20 HPCs.	• Complete climate change and health diagnostics and resilience assessments of the 19 MPCs.	• Complete climate change and health diagnostics and resilience assessments of the six LPCs.
• Support IDA/IBRD countries to increase core capacities on the sound management of public health risks related to climate change, and on mainstreaming of climate-sensitive diseases in health operations	<ul style="list-style-type: none"> <li>• Prepare climate-resilient strategies in all HPC based on diagnostics.</li> <li>• 50% HPCs with active WBG operations develop a capacity building plan specific to climate change and health adaptation</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare climate-resilient strategies in all MPCs based on diagnostics.</li> <li>• 75% of HPCs and 50% of MPCs with active WBG operations develop a capacity building plan specific to climate change and health adaptation.</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare climate-resilient strategies in all LPCs based on diagnostics.</li> <li>• 100% of HPCs, 75% of MPCs and 50% of LPCs with active WBG operations develop a capacity building plan specific to climate change and health adaptation.</li> </ul>
• Strengthen governance, policy, and cross-sectoral collaboration	<ul style="list-style-type: none"> <li>• All HPCs with active WBG operations designate a focal point in the ministry of health.</li> <li>• Provide TA on multisectoral governance and policy actions to all HPCs with active WBG operations.</li> </ul>	<ul style="list-style-type: none"> <li>• 50% of HPC with active WBG operations implement capacity building plan.</li> <li>• All MPCs with active WBG operations designate a focal point in the ministry of health.</li> <li>• Provide TA on multisectoral governance and policy actions to all MPCs with active WBG operations.</li> </ul>	<ul style="list-style-type: none"> <li>• 100% of HPCs, 75% of MPCs and 50% of LPCs with active WBG operations develop a capacity building plan specific to climate change and health adaptation.</li> <li>• All LPCs with active WBG operations designate a focal point in the ministry of health.</li> <li>• Provide TA on multisectoral governance and policy actions to all LPCs with active WBG operations</li> </ul>

Table 13.1: Support to HNP Programs (continued)

Activity	Expected outcomes		
	Fast track (by 2023)	Long term (by 2026)	Longer term (by 2030)
<ul style="list-style-type: none"> <li>Strengthen governance, policy, and cross-sectoral collaboration</li> <li>Ensure that HNP operations address climate change (adaptation and mitigation), where appropriate</li> </ul>	<ul style="list-style-type: none"> <li>50% of HNP operations include climate-smart health interventions.</li> </ul>	<ul style="list-style-type: none"> <li>10 HPCs with HNP engagements effectively (per established criteria) implement climate-resilient strategies.</li> <li>55% of HNP operations include climate-smart health interventions.</li> </ul>	<ul style="list-style-type: none"> <li>15 HPCs and 8 MPCs with HNP engagements effectively (per established criteria) implement climate-resilient strategies.</li> <li>65% of HNP operations include climate-smart health interventions.</li> </ul>
<ul style="list-style-type: none"> <li>Increase investments to address climate change</li> </ul>	<ul style="list-style-type: none"> <li>IBRD/IDA average (FY19–23) financing: 10% of total commitments include climate co-benefits.</li> </ul>	<ul style="list-style-type: none"> <li>IBRD/IDA average (FY19–25) financing: 15% of total commitments include climate co-benefits.</li> </ul>	<ul style="list-style-type: none"> <li>IBRD/IDA average (FY19–30) financing: 18% of total commitments include climate co-benefits.</li> </ul>

### Country prioritization

The WBG compared the Health and Human habitat vulnerability subindexes of the ND-GAIN country index for 2014 to identify African countries that are already experiencing, or are likely to experience, a change in the burden of disease due to the impacts of climate change (i.e., hotspot countries) (World Bank 2017c).

Based on this assessment, countries were prioritized as follows:

- High priority country (HPC)**, if they are highly vulnerable to health and habitat impacts of climate change: Benin, Burkina Faso, Burundi, the Central African Republic, Chad, the Democratic Republic of Congo, Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Niger, the Republic of Congo, Rwanda, São Tomé and Príncipe, Sierra Leone, Togo, Zambia.
- Moderate priority country (MPC)**, if they are highly vulnerable to health risks: Comoros, Côte d'Ivoire, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nigeria, Senegal, South Sudan, Tanzania, Uganda, Zimbabwe) or habitat risk (Angola, Cameroon, Equatorial Guinea, Gabon).
- Low priority country (LPC)**, if they exhibit a lower vulnerability to health or habitat risks: South Africa, Namibia, Algeria, Cabo Verde, Botswana, Swaziland.

Main partners	Resource mobilization	Funding
National and subnational governments led by Ministries of Health, Environment, Water, Finance, Agriculture, Urban planning, WHO Africa Regional Office, Africa CDC, African Union, University of Notre Dame, Institute for Health Metrics and Evaluation, WMO, and UNEP-WHO health and environment strategic alliance, local NGOs, other development partners, e.g., UNICEF, UNHCR, WFP, USAID, and the Bill & Melinda Gates Foundation.	Source	Amount (US\$, millions)
	Domestic sources	0
	IDA <sup>a</sup>	1,000
	Climate finance trust funds	15
	Other development finance (bilaterals, multilaterals)	200
	Private sector	n.a.
	To be determined	n.a.
	Total fast track (resources raised by 2025)	1,215
Longer term (additional resources raised by 2030)	2,430	

a. Financing subject to country prioritization from IDA allocations.

## Sectoral Background and Development Challenges

While much progress has been made, health systems across the region remain under pressure. Sub-Saharan Africa is still grappling with the unfinished business of the Millennium Development Goals, particularly the goals of reducing maternal and child mortality, malnutrition, and infectious diseases such as tuberculosis, malaria, and HIV/AIDS. As African countries become more prosperous and embrace urbanization and the subsequent health and lifestyle adjustments, chronic diseases facing donor countries are more prevalent, such as diabetes and heart disease, which are now claiming more African lives than ever before.

In addition, pandemics and outbreaks have become more frequent, further weakening already weak health systems, with serious health, social, and economic consequences. The 2013 Ebola outbreak in West Africa was perhaps the most striking test to the resilience and sustainability of national health systems. With an understaffed and underpaid health workforce, limited financing, and weak infrastructure, health systems in the region are hugely unprepared for large-scale abrupt shocks. They require support to deliver accessible, affordable, and high-quality health services.

Climate change is presenting new health threats, which may reverse decades of progress in improving health outcomes. Climate variability and change is expected to adversely affect health through direct pathways. Extreme weather events, such as storms and floods, cause injuries, deaths, and outbreaks of food-, vector-, and waterborne diseases (e.g., diarrhea). An increase in the number of very hot days in large cities, along with forest fires and dust storms, adversely impact air quality and exacerbate the occurrence and intensity of diseases associated with elevated temperatures (e.g., heat exhaustion and heat strokes) and respiratory diseases (e.g., asthma attacks) (Serdeczny et al. 2015). For example, in Ghana high ambient temperatures have been associated with an increase in mortality, particularly in young children and the elderly (Azongo et al. 2012) while flooding in Kenya in 2018 claimed the lives of 170 people, displaced 300,000 and saw more than 700 people admitted to health facilities with cholera (MSF 2018).

Indirect health impacts of climate change occur through effects on ecosystems. Drought conditions affect the availability and quality of water, which has been linked to illnesses such as diarrhea and tropical diseases. Agricultural losses have an impact on the availability and affordability of nutritious food, leading to undernutrition and micronutrient deficiencies. In addition to the reduction in crop productivity, the impact of climate change on other drivers of stunting (e.g., water quality and quantity, labor productivity of women, and disease distribution) will increase its prevalence (World Bank 2015b). For example, in Niger, children aged two or less born during a drought are 72 percent more likely to be stunted (Kristin et al. 2010). And despite the already high prevalence of stunting in Western (31.4 percent), Central (32.5 percent) and Eastern Africa (36.7 percent), climate change is predicted to contribute an additional 7.5 million stunted children by 2030 (WHO 2014b). The rates of severe stunting, a condition associated with a slightly more than fourfold increased risk of death in children under five, is projected to increase in Eastern and Southern Africa by 55 percent, and Central Africa by 23 percent (Lloyd, Kovats, and Chalabi 2011). Seasonal variations in rainfall distribution and temperature and habitat degradation are predicted to cause a resurgence



of older diseases (e.g., Rift Valley fever) and change patterns of more prevalent diseases like malaria, dengue, and Ebola (IPCC 2018).<sup>14</sup> The rates of Malaria are projected to increase for Eastern, Central and Southern Africa. For East Africa, estimates of additional people vulnerable to Malaria due to climate change range from 40 million to 80 million under 2° warming and 70 million to 170 million under 4° warming (Caminade et al. (2014). Other indirect health impacts occur due to disruptions in social processes (e.g., leading to population displacement and conflict); and economies (e.g., impact on national economies and infrastructure limit the provision of health and other services).

Communities and populations of all incomes are vulnerable to climate-related health risks, with the most at-risk groups being women, young children, the elderly, people with preexisting health conditions or disabilities and poor or marginalized households (IPCC 2018). These climate-related health impacts will exacerbate existing poor health outcomes, adding excess burdens to already weak health systems. While research capacity for monitoring and projecting the health impacts of climate change is limited, the World Health Organization (WHO 2014b) estimates that there will be approximately 241,000 additional climate change-related deaths in the year 2030, with the greatest share coming from Sub-Saharan Africa (approximately 157,000).

## Human Capital and Economic Costs of Climate Change

Human capital refers to an aggregated level of education, skills, resilience, and health that people accumulate over their lives, which enable them to contribute to the economic productivity of a country (World Bank 2018). Human capital is a principle driver of growth and is attributed with cross-country differences to account for 10 percent to 30 percent of per capita gross domestic product (GDP).

The World Bank's Human Capital Project (HCP) has reignited discussions around the critical need to invest in human capital to promote economic growth. The HCP seeks to determine how much human capital a child born today can expect to attain by the end of secondary school, given the risks of poor health and education that prevail in the country where she or he is born. One of the ways that this can be quantified is through an international metric called the Human Capital Index (HCI), which measures the amount of human capital that the average child in each country, born in 2018, expects to achieve.

A precursor to human capital accumulation is good health; people learn more effectively and are more productive when they are healthy. Climate change is projected to increase the prevalence of stunting in Sub-Saharan Africa, and the burden of disease, including malaria, diarrhea, and respiratory infection in children under five years old (Paynter et al. 2010). Sick children spend less time in school than healthy ones, and stunted children

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14 This includes changes in the geographic range of the disease, seasonality, and intensity of transmission.

have delayed cognitive development, which reduces their capacity to learn. Moreover, the projected increase in climate-related morbidity and premature deaths in adults could have a catastrophic impact on labor productivity.

Natural disasters damage and destroy schools, thereby impeding access to education, while heat stress reduces cognitive performance and disrupts learning. These effects are expected to be more profound in Africa, which is both a warmer region and has limited climate-controlled buildings. Failure to implement adaptation and resilience mechanisms to mitigate the impacts of climate change on health and education outcomes could lead to a significant reduction in the number of skilled and productive workers entering and remaining in the workforce in the future.

The economic costs of climate-related health impacts are projected to be enormous. WHO estimates that the direct damage cost to health could reach US\$2 billion to US\$4 billion per year by 2030 (WHO 2018). Moreover, millions of people could be pushed into poverty as a result of health expenditures, lost labor income due to illness or injury and long-term impact on productivity due to disability (Hallegatte et al. 2016). One study projects that the additional costs associated with the excess disease burden related to climate-sensitive diseases (malaria, diarrheal illnesses, and malnutrition) could be between US\$4 billion to US\$12 billion in 2030 under a 750 parts per million scenario (Ebi 2016). At the household level, climate-sensitive diseases impose an immense financial burden, particularly for the poorest households. For example, under climate change conditions, the burden of diarrhea is projected to increase by up to 10 percent, and each episode can cost as much as US\$2 to US\$4 for treatment, coupled with the loss of three to seven days of work each for the sick individual and caregiver. Moreover, in Malawi, malaria treatment represents 2 percent of monthly income for the average household, but 28 percent for poor households (Hallegatte et al. 2016).

### Health Sector Contribution to Climate Change

The health sector contributes to climate change because it emits carbon for its operations. While there is no estimate yet as to the carbon footprint of the African health sector, extrapolations project the health sector may contribute between 3 percent to 5 percent to the regions' greenhouse gas (GHG) emissions based on figures from South Africa and other low-income countries (LICs). Ironically, hospitals in Sub-Saharan Africa, while emitting carbon, also experience energy starvation. One study reveals that among 11 African countries assessed, only 28 percent had reliable electricity, which therefore leads many hospitals to use generators and other fossil fuel intensive sources (Adair-Rohani et al. 2013).

Energy is critical in the provision of healthcare; therefore this situation can leapfrog healthcare systems to adopt clean renewable energy, such as solar and wind, to protect the climate, promote health, and advance multiple Sustainable Development Goals (SDGs). Hospitals should develop resilience strategies to implement sustainable policies on waste management, procurement, and transportation that will withstand extreme weather events and other climate change impacts.

## Initiatives to Address the Challenges and Enhance Resilience

African governments have demonstrated a strong political commitment to curbing the impact of climate change on health outcomes. Through the adoption of the Libreville Declaration (2008), and the Luanda commitments (2010), 51 African countries committed to implementing an essential public health package to enhance the climate resilience of the health sector. Furthermore, at least 15 Sub-Saharan African countries include health as a priority in their National Adaptation Programmes of Actions (NAPAs). However, implementation has been hampered by institutional barriers, resource constraints, insufficient technical capacity, and other challenges (WHO Africa 2014).

The World Bank supports the ambitious goals of its clients. Moreover, its engagement on climate change and health aligns with its commitment to support client countries accelerate investments in human capital. World Development Report (WDR) 2019: *The Changing Nature of Work* (World Bank 2019) demonstrates that to sustain current economic growth trajectories and remain competitive in the global economy, African countries will need a workforce prepared for the highly skilled jobs of the future. This can happen if the impacts of climate change on human capital are moderated through critical investments.

The World Bank supports African governments' commitments toward universal health coverage (UHC). Synergies between UHC and climate health are defined in *Climate Change and Health Approach and Action Plan* (World Bank 2017c). The integration of low-carbon and climate-resilient healthcare into countries' UHC strategies (i.e., climate-smart UHC) will allow African countries to (i) establish systems for fair, efficient, and sustainable financing of Health, Nutrition, and Population (HNP) services that are adaptable (i.e., flexible and scalable); (ii) ensure equitable access to affordable and resilient quality HNP services; and (iii) leverage climate-smart interventions in other sectors to strengthen HNP results and generate public goods.

At a strategic level, the World Bank Group has stimulated climate-smart healthcare action by raising awareness on the health effects of climate change in global discussions and through generating knowledge on the relationship between climate change and health (World Bank 2014; World Bank 2015c). It has highlighted opportunities for investing in low-carbon solutions and has supported greater climate resilience across the health sector.



When communities gain access to running water, sanitation and hygiene are immediately improved. (Shutterstock/Ricardo Mayer)

With partners, the World Bank Group has developed tools and approaches to help guide countries on climate-smart healthcare investments that mitigate climate change impacts. These include strategies to provide reliable, low-carbon sources of energy (WHO/World Bank 2014); regional assessments on geographic hotspots, methodological guidance on vulnerability and risk assessments at a national and subnational level, and an operational framework on how to strengthen human, animal, and environmental public health systems.

The World Bank has encouraged all HNP projects to become more climate smart, including articulating expected climate co-benefits in their designs. The new Environmental and Social Framework also addresses climate and health risks. Since 2017, all projects supported by the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) (including those in HNP) require screening to determine the degree that climate change will impact project outcome and success. For example, an in-depth evaluation of climate change and health vulnerability in Madagascar led to an investment of US\$2.6 million in climate-sensitive health interventions.

The HNP Africa Climate and Health Strategy (2018–30) builds on the analytical and operational experience gained over the years to support Sub-Saharan African countries reduce the impact of climate change on all aspects of health, strengthen the climate resilience of their health systems, and contribute toward climate change mitigation (box 13.1).

### **Box 13.1 Strengthening the Climate Resilience of Health Systems in West Africa**

The World Bank's Regional Disease Surveillance Systems Enhancement Series of Projects (REDISSE), launched in 2016, enhances disease surveillance in the Economic Community of West African States (ECOWAS). These projects aim to strengthen surveillance and early warning systems for climate-sensitive diseases. The program stems from the World Bank's mobilization of more than US\$1.6 billion in financing associated with the West African Ebola outbreak. It builds upon the Ebola response and recovery efforts to establish core country and regional capacities to help build a resilient, broad-based disease surveillance and response system, based on intercountry collaboration and collective action. The projects' designs reflect a paradigm shift from a program grounded in crisis response to one that embraces a health disaster risk reduction approach and better risk management to rapidly detect and respond to biological hazards of national and international concern. This reduces the burden of diseases, and it aids in mitigating the public health and economic risks posed by infectious diseases in humans and animals. The program helps to improve disease surveillance infrastructure, information sharing, and collaboration across the health, agriculture, and environmental sectors in West Africa. It is part of health synergies in a region experiencing rapid population growth, increasing climate instability, changing agricultural production systems, widespread deforestation, natural resource depletion, and environmental pollution and degradation.



A young girl attends school in Dar es Salaam, Tanzania (Shutterstock/Anca Miloshev)

## 14. Promoting Climate-Smart Education

### Context

Education is a critical part of long-term efforts to mitigate and adapt to climate change: it is the vehicle by which greater awareness and behavior change can occur. As such, increased resources to support climate-smart initiatives in the sector are important across Africa. Efforts should target climate-smart education infrastructure (e.g., construction and rehabilitation of schools, teacher dorms, facilities, and equipment); integration of relevant climate change topics into the curriculum; introduction of climate change issues into teacher training (preservice or in-service); technical and vocational training to develop skills in fields important for addressing climate change (e.g., renewable energy); strengthened research in climate change innovation and higher education policies (e.g., hydrometeorological risk analysis, agroclimatology). Table 14.1 summarizes how the Education component will help to reduce the climate change impact and support knowledge generation and capacity building in climate change.

### Sectoral Background and Development Challenges

Climate change is increasingly impeding children's access to education and their learning environment, leaving those in poorest communities with serious long-term consequences.



**Table 14.1:** Expected Outcomes of World Bank Support for Climate-Smart Education

Activities	Baseline (FY19) <sup>a</sup>	Expected outcomes (share of projects approved in previous FY)			
		Fast track (by 2023) (%)	Long term (by 2026) (%)	Longer term (by 2030) (%)	
<b>Climate-smart infrastructure<sup>b</sup></b> Construct and rehabilitate schools, teacher dorms, facilities, equipment	2/10 (20%)	40 <sup>c</sup>	60	80	
<b>Curriculum development and reform</b> Integrate relevant climate change topics into curriculum	1/10 (10%)	30 <sup>d</sup>	50	70	
<b>Pre- and in-service teacher training</b> Introduce climate change issues	3/11 (27%)	50 <sup>e</sup>	70	90	
<b>Technical and vocational training skills acquisition</b> Develop skills in fields important for addressing climate change (e.g., renewable energy)	0/2 (0%)	20 <sup>f</sup>	40	60	
<b>Technical expertise (tertiary)</b> Strengthen research in climate change innovation and policy in higher education (e.g., hydrometeorological risk analysis, agroclimatology)	0/2 (0%)	20 <sup>g</sup>	40	60	
<b>Main partners</b>		<b>Resource mobilization</b>	<b>Funding</b>		
WBG client countries; EU; DFID; AFD; UNICEF; GIZ; WFP; Danida; JICA; ECOWAS		<b>Target increase (%)</b>	<b>2</b>	<b>3</b>	<b>4</b>
		<b>FY19</b>	<b>2023</b>	<b>2026</b>	<b>2030</b>
		<b>IDA</b> 1,026	20.52	30.78	41.04
		<b>Trust funds</b> 59	1.18	1.77	2.36
		<b>Target amounts</b>	<b>21.7</b>	<b>32.55</b>	<b>43.4</b>

- a. Denominator is total number of projects approved in FY18.
- b. Climate-smart education infrastructure may include the following construction guidelines for schools to review and update standards for safe and sustainable buildings in areas prone to droughts and natural disasters and to improve the learning environment by constructing new buildings that incorporate good practices to improve resilience to climate hazards. It may include mitigation activities such as constructing or retrofitting education facilities to be substantially more energy efficient than the prevalent standard in the area (e.g., conducting energy audits, installing solar panels, using energy efficient water harvesting and recycling for facilities in arid climates, drainage improvement and terracing for flood control, using roofing material that can sustain strong winds and rains).
- c. Denominator is total number of projects approved in FY18 with theme “access” in standard reports.
- d. Denominator is total number of projects approved in FY18 with theme “standards, curriculum, and textbooks” in standard reports.
- e. Denominator is total number of projects approved in FY18 with theme “teachers” in standard reports.
- f. Denominator is total number of projects approved in FY18 with sector “Workforce Development and Vocational Education” in standard reports.
- g. Denominator is total number of projects approved in FY18 with sector “Tertiary Education” in standard reports.

Natural disasters (e.g., the floods in Sierra Leone in August of 2017) damage and destroy schools, thereby eliminating access and the presence of a safe school environment. In addition, reduced agricultural productivity, due to droughts and temperature shocks, make it difficult for parents to send their children to school in light of competing demands for limited financial resources.

The issue is particularly challenging in rural Sub-Saharan Africa (Randell and Gray 2016). Household survey results show that early life climatic conditions—milder temperatures during all seasons and increased summer rainfall—are associated with



an increased likelihood of children completing their education. Further, greater summer rainfall during both early life and school ages is associated with completing various levels of schooling as well as with attending school at the time of the survey. These findings suggest that future climate change may reduce children's school participation in rural areas, and thereby slowing progress toward human development goals and poverty alleviation.

Climate change impacts some vulnerable groups more than others. Females are more vulnerable, which poses additional challenges to their education and therefore their long-term prosperity. During adverse weather conditions, such as rainfall-driven floods or droughts, girls are often the first to be withdrawn from school or attend less frequently due to perceived safety hazards (reduced transportation options in heavy rains) and increased demand on their time for household responsibilities, such as fetching water (Kwauk and Braga 2017).

In recent years, and especially during FY18, the World Bank's Education sector has introduced measures to help client countries build systems with greater resilience to climate risks. Examples include school infrastructure projects that use climate-adaptable designs, solar power that can be essential during grid failures, water recycling and harvesting, and other green building technologies. These measures are part of school construction design standards. For example, the Tanzania Education Program for Results (P162479) employs a climate-smart design so construction and retrofitting of education facilities are substantially more energy efficient than the prevalent standard in the area (e.g., energy audits, solar panels, and energy efficient appliances and equipment).

Education offers an important vehicle for short- and long-term responses to climate change. Investing in climate-resilient and adaptable infrastructure enables continued education during times of extreme conditions. Reforming curriculums to incorporate education on effects of climate change at primary, secondary, and tertiary levels give students the knowledge and skills to make informed decisions about how to adapt their lives and ecological, social, or economic systems in a changing environment. Building this awareness among future generations is the most sustainable mechanism in instilling long-term changes in attitudes and behavior.

Through revision of learning curriculums and teacher training, the sector has incorporated climate mitigation and adaptation into its primary and secondary education curricula. The Cameroon Education Reform Support Project (P160926) integrates climate change mitigation and adaptation into teacher training materials. The project also supports teacher training on how to prepare and carry out evacuations at the onset of climate-induced emergencies, such as cyclones and floods.

At a regional level, the sector has helped to develop long-term solutions. The Eastern and Southern Africa Higher Education Centers of Excellence (P151847) have dedicated research grants for technologies, processes, and policies contributing to climate change mitigation (e.g., agroforestry, carbon sequestration) and adaptation (e.g., hydrometeorological risk analysis, agroclimatology). The Africa Regional Scholarship and Innovation Fund for Applied Sciences, Engineering and Technology Project (P165581) supports stronger research in areas contributing to climate change innovation and adaptation (box 14.1).

In the technical and vocational subsector, the Bank has supported the shift from traditional skills acquisition to more modern ones, including trainings that focus on renewable energy, energy efficiency, and environmental preservation. These skills are not only beneficial for building resilience but are drivers for economic growth in the target countries as they replace outdated markets. For example, the Niger Skills Development for Growth Project AF (P163467) supports technical and vocational training for skills in high demand areas.

### **Box 14.1 Africa Regional Scholarship and Innovation Fund for Applied Sciences, Engineering and Technology**

The Africa Regional Scholarship and Innovation Fund (RSIF) for Applied Sciences, Engineering and Technology project (P165581) provides support to strengthen the institutional capacity for quality and sustainable doctoral training, research, and innovation in transformative technologies in Sub-Saharan Africa. Host institutions will develop technical and institutional capacity for research and innovation in climate-related fields. For instance, the RSIF PhD program at the center for Climate Change, Biodiversity, and Sustainable Agriculture at the University Félix Houphouët-Boigny (Côte d'Ivoire) focuses on biodiversity, food security, and energy. The center offers programs on climate change, including (i) climate change risk analysis, evaluation, and management (climatic data, air pollution, water, soil, pesticides), (ii) agroclimatology, (iii) modeling, (iv) mitigation strategies for climate change (carbon sequestration), (v) agrobiodiversity and agroforestry systems, (vi) dissemination of agricultural technical innovations using information and communication techniques accessible to farmers, and (vii) adaptation of crop calendars to climate variability. The regional coordination unit will build a knowledge base on climate change through development of cross-cutting courses on climate change for PhD scholars and faculty. In addition, the IT vendors for the project will submit disaster and risk mitigation plans and provide training on emergencies on climate change and disaster risks to system operators.

Increased efforts to address climate change in the education sector are highlighted through corporate-level climate co-benefits. In FY18, the Africa Education Portfolio saw a fivefold increase in its commitments with direct climate co-benefits (from US\$1 million in FY17 to US\$5 million in FY18).

In internal efforts, the Human Development VPU organized a climate change working group across its three Global Practices (Education; Health, Nutrition, and Population [HNP]; and Social Protection and Jobs [SPJ]) to coordinate efforts on climate change. A key output from this group was the preparation of an Human Development guidance note with practical case examples for task teams. Moving forward, the objective is to further build the partnership with the Climate Change Group and establish a focal point to provide technical support and assistance to education operational teams and provide customized training on the methodology of incorporating climate considerations into project design.

# 15. Green Financial Systems, Financial Protection Instruments, and Green Competitiveness

## Context

The Paris Climate Accord of 2015 sets an ambitious objective to keep the temperature increase well below 2°C. The IPCC Special Report (2018) underscores the need to keep warming to below 1.5°C to reduce the scale of climate impacts. Low-income countries (LICs) and upper-middle-income countries (UMICs) must transition to low-carbon and climate resilience to meet this goal and to brace for intensified climate impacts. Failing to keep temperatures below 2°C, or at 1.5°C, as indicated by the IPCC Special Report (2018), will cause negative social and economic externalities that will have spillover effects on the financial sector's deepening and stability.

Given the burden of fiscal pressure on countries, mobilizing private capital and financial institutions is essential to support the investment needed for the transition. For emerging markets only, the investment needs to be financed by 2030 are US\$23 trillion! Therefore, financial institutions and the financial system can mobilize capital for long-term investments while taking social responsibility through environmentally sustainable development. In addition, client countries have more appetite for socially responsible investment, which contributes to financial institutions' engagement.

The financial sector needs to meet these steep challenges in connecting the supply of finance (e.g., long-term resource and adequate products and services) with the demand for both individuals and firms, because those industries are projected to be responsible for 26 percent of the increase in greenhouse gas (GHG) emissions from 2005 to 2030 (World Bank 2015e). Firms need to increase competitiveness by adopting of climate-efficient solutions and clean technology, particularly in agriculture and tourism sectors, which are most affected by climate change.

The World Bank supports climate engagement and solutions in the financial system through priority activities that seek to mainstream climate risks into policies and regulations, standards, and frameworks governing the financial sector; improve financial protection against climate-related risks; and promote firm green competitiveness. Activities and outcomes for this new Africa Climate Business Plan (ACBP) component are summarized in table 15.1. Action will be prioritized on three fronts.

**Table 15.1:** Expected Outcomes of World Bank Support for Green Financial Systems, Financial Protection Instruments, and Green Competitiveness

Activity	Expected outcomes		
	Fast track (by 2023)	Long term (by 2026)	Longer term (by 2030)
<ul style="list-style-type: none"> <li>Build a better understanding of links between climate and related environmental factors with local financial sectors in Africa through research, data collection, and dissemination workshops</li> <li>Conduct climate risk in financial sector assessment and develop projects that promote and integrate green elements (including green policies, regulations, investment, and risk management practices, data sources or financial instruments) into banking, capital markets, and pension funds to promote green financial systems nationally</li> </ul>	<ul style="list-style-type: none"> <li>A report on the impact of climate change on financial sectors in Sub-Saharan Africa.</li> <li>Conduct climate risk assessment in financial sector in two countries and one country program that integrates green elements into local banking, capital markets, and pension funds.</li> </ul> <p>Development outcomes (similar for each period):</p> <ul style="list-style-type: none"> <li>Transfer knowledge on green financial systems, raising awareness on climate-related financial risks and opportunities among financial policy makers, regulators, and market participants.</li> <li>Align financial sector policies, regulations, and strategies with NDCs and climate adaptation strategies.</li> <li>Increase climate share of investments in a client country, contributing to climate mitigation and adaptation targets.</li> <li>Increase capacity to manage and reduce climate- and carbon-related financial risks by supervisors and financial institutions, thus contributing to improve national financial stability in the context of climate events and policy changes.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct two more climate risk assessments in financial sector and develop two more country programs that integrate green elements into local banking, capital markets, and pension funds.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct five climate risk assessments in financial sector and develop four country programs that integrate green elements into banking, capital markets, and pension funds.</li> </ul>
<ul style="list-style-type: none"> <li>Cover more countries with new or improved financial protection instruments, including insurance, risk pools, and contingent finance (baseline 2018: 23)</li> </ul>	<ul style="list-style-type: none"> <li>Cover three more countries with new or improved financial protection instruments, including insurance, risk pools, and contingent finance.</li> </ul> <p>Development outcomes (similar for each period)</p> <ul style="list-style-type: none"> <li>Strengthen institutional capacity to integrate financial protection in fiscal and budget planning through policy measures, investment decisions, and the development of a broader menu of financial solutions.</li> <li>Strengthen technical capacity to design and implement appropriate financial instruments through technical assistance and the development of tools to inform decision making.</li> <li>Increase financial capacity to respond to climate shocks through the design and implementation of an appropriate financial protection strategy, which includes an efficient combination of financial instruments to optimize the timing and minimize the cost of response.</li> <li>Integrate risk financing and insurance solutions within preparedness, response, and recovery plans anchored in country systems.</li> </ul>	<ul style="list-style-type: none"> <li>Cover six more countries with new or improved financial protection instruments, including insurance, risk pools, and contingent finance</li> </ul>	<ul style="list-style-type: none"> <li>Cover 10 more countries with new or improved financial protection instruments, including insurance, risk pools, and contingent finance.</li> </ul>

Kenyan Farmers create cooperatives and build capacity and credit for climate smart agriculture. (World Bank)



**Table 15.1:** Expected Outcomes of World Bank Support for Green Financial Systems, Financial Protection Instruments, and Green Competitiveness (*continued*)

Activity	Expected outcomes		
	Fast track (by 2023)	Long term (by 2026)	Longer term (by 2030)
<ul style="list-style-type: none"> <li>Increase green competitiveness and innovation in climate-related advancements and protection against climate impacts</li> </ul>	<ul style="list-style-type: none"> <li>Release report on climate resilience of industries and industrial infrastructure.</li> <li>Develop five country programs that integrate green competitiveness into their growth strategies.</li> </ul> <p>Development outcomes (similar for each period)</p> <ul style="list-style-type: none"> <li>Increase capacity of industries to contribute to climate solutions in tourism, agribusiness, and manufacturing.</li> <li>Ensure that industries and their supporting infrastructure are resilient to climate disasters.</li> </ul>	<ul style="list-style-type: none"> <li>Develop 10 country programs that integrate green competitiveness into their growth strategies.</li> </ul>	<ul style="list-style-type: none"> <li>Develop 20 country programs that integrate green competitiveness into their growth strategies.</li> </ul>
<b>Main partners</b>		<b>Resource mobilization</b>	<b>Funding</b>
<p>Sustainable Banking Network, IFC, WRI, GIZ, Global Program on Sustainability, Network for Greening the Financial Sector, WBG countries, IMF</p> <p>GFDRR, ACP-EU NDRR, SIDA, USAID, DFID, Netherlands Ministry of Foreign Affairs</p> <p>UNIDO, GIZ, JICA, Government of Korea, WEF, IFC clients</p>		<p>Estimated budget needs for TA activities: US\$1 million by 2023, US\$1.7 million by 2026, US\$3.1 million by 2030.</p> <p>Estimated budget for TA activities from bilateral and multilateral development finance sources: US\$9 million by 2023, US\$14.8 million by 2026, US\$22 million by 2030.</p> <p>Estimated budget for lending: US\$210 million by 2030 from country IDA allocations.</p> <p>Estimated budget needs TA activities: US\$25 million; lending: US\$200 million.</p>	



**Develop country programs and projects that promote and integrate green elements into banking, capital markets, and pension funds.** The financial sector in many African countries lacks capacity, yet this represents an opportunity to integrate climate considerations at an early stage and to align their financial sector with long-term climate goals. The World Bank Group is committed to assist African countries in alignment efforts and in designing country programs that will promote and integrate green elements—including green policies, regulations, investment and risk management practices, data sources, and financial instruments—into banking, capital markets, and pension funds. Initial steps can support countries with research and assessments of climate-related financial risks and opportunities. These analytics can raise awareness among financial policy makers, regulators, and market participants on how their financial sector interacts with climate change and help guide them with how to respond. Based on better analytics, the World Bank intends to offer technical assistance for implementing green finance solutions and instruments at the country level. This could include supporting regulators to incorporate climate risks in their supervisory frameworks, issuing green bonds at the country level, supporting the setup of dedicated green investment funds, and supporting pension funds and sovereign wealth funds in incorporating environment, social, and governance performance standards in their investments.

Over the past few years, African countries have incorporated green elements in their financial system (e.g., Kenya, Nigeria) (box 15.1). There is an opportunity to leapfrog African countries into green economies, especially those whose markets and financial systems are nascent or nonexistent. As such, the objective is to develop four country programs that integrate green elements into banking, capital markets, and pension funds by 2030.

### **Box 15.1 Green Elements in Banking and Capital Markets in Sub-Saharan Africa**

African central banks, regulators, and banking associations are active participants in global discussions and knowledge exchange platforms on green and sustainable finance. For example, the Sustainable Banking Network, a World Bank-supported knowledge exchange platform, includes four representations from Sub-Saharan African countries: Nigeria, Kenya, Ghana, and South Africa. Nigeria was the first African country to issue a sovereign green bond in December 2017. The proceeds of the five-year US\$30 million sovereign bond are to be used for environmental purposes only. Kenya's Bankers Association introduced Sustainable Finance Guiding Principles in 2015. Nairobi Securities Exchange and development partners launched a Green Bond program in 2017.

**Cover more countries with new or improved financial protection instruments, including insurance, risk pools, and contingent finance.** Through the Africa Disaster Risk Financing Initiative (ADRF), the World Bank supports the development of multirisk financing strategies to help African countries make informed decisions and to mitigate the socioeconomic, fiscal, and financial impacts of disasters, thereby increasing climate resilience.

ADRF works in Benin, Cabo Verde, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Seychelles, South Africa, Swaziland,



## Box 15.2 Contingency Financing in the Northern Uganda Social Action Fund

The World Bank–financed Northern Uganda Social Action Fund (NUSAF) III project has a US\$12 million disaster risk finance component. It provides additional postdisaster support to vulnerable households by automatically scaling up the NUSAF III's Labor Intensive Public Works' activities during crises to build resilience of beneficiary households. The 2016 El Niño caused widespread drought in the Karamoja region. The parametric index developed under the NUSAF project captured the drought and triggered a scaling up of the Labor Intensive Public Works. As a result, US\$4.1 million was disbursed to finance disaster assistance to approximately 30,000 households, or 150,000 people, in Karamoja. It is estimated that the disaster risk finance component of NUSAF III will finance the cost of scaling up to aid 80,000 additional households (400,000 people) over the lifetime of the operation.

## Box 15.3 Cat-DDO Approved for Kenya

Extreme climatic events have long threatened development progress in Kenya, where 84 percent of the land is classified as arid or semi-arid, and where droughts and floods are estimated to cost the economy over 2 percent of gross domestic product (GDP) each year, on average.

In June 2018, the World Bank approved a US\$200 million Development Policy Loan (DPL) with a Catastrophe-Deferred Drawdown Option (Cat-DDO) for Kenya. This innovative contingent line of credit provides immediate liquidity in the aftermath of a disaster resulting from an adverse natural event. The Cat-DDO is the first World Bank development policy operation in Kenya in the last 10 years and will be a foundation for policy dialogue and support the Government of Kenya's proactive efforts to manage disaster and climate risks with a comprehensive program of reforms.

Preparing this instrument involved discussing prior actions between the ADRF team and the government to strengthen the country's institutional, technical, and financial capacity to manage the impact of natural hazards, and to improve the country's fiscal resilience. As one prior action, the government approved the National Disaster Risk Financing Strategy. This marks the first DRF strategy to be implemented in Sub-Saharan Africa, and the project received 100 percent climate co-benefits. This milestone paves the way for other countries to develop similar instruments and develop risk financing strategies.

Uganda, Zambia, and Zimbabwe. The team is looking to deepen its engagement in countries where it has operations and expand where demand exists. Box 15.2 and box 15.3 highlight successful examples of these initiatives.

The World Bank **Global Index Insurance Facility** (GIIF) provides access to finance to smallholder farmers, microentrepreneurs, and microfinance institutions through the development and growth of local markets for indexed and catastrophic insurance. Its goal is to foster sustainable development in the agricultural sector in LICs. GIIF has trained practitioners from Benin, Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Gabon, Ghana, Kenya, Mali, Mozambique, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Togo, Uganda, and Zambia (box 15.4). The program has also extended capacity building grants to six insurers in Zambia, Cameroon, Côte d'Ivoire, Mozambique, and an insurance intermediary in Kenya. The region will seek to advance this work through expanded protection coverage in 10 more countries.

## Box 15.4 Impact of GIIIF-Facilitated Training in Nigeria and Zambia

Nigeria's insurance industry had been trying for years, unsuccessfully, to secure licenses to offer index insurance products. After participating in a GIIIF training session in Ghana in May 2017, the Nigerian insurance regulator—equipped with the necessary skills to evaluate such products—issued licenses to five companies in August 2017. Four of the five companies issued policies to 15,000 farmers in the July through October season, helping them manage their risk and giving them access to bank loans and guarantees. Following another training for insurance professionals, held in Lagos in February 2018, the regulator announced its intention to issue licenses for weather-based index insurance to 15 additional companies by the end of 2018, with the aim of promoting competitiveness and insuring millions of households in the next two to three years. This process will unlock access to finance and protecting farmers against the effects of climate-related shocks.

In Zambia, Mayfair Insurance has been a GIIIF performance-based grantee since March 2016, with the objective of reaching about 100,000 farmers by 2019. After participating in a GIIIF-facilitated training session in Ghana, Mayfair and the Zambia insurance regulator convinced the government to bundle index insurance to the farmer input subsidy program. As a result, an insurance policy was issued, covering 900,000 farmers by February 2018. This is the first time a GIIIF program has been able to cover more than 500,000 farmers in one season. It testifies to the need for public-private partnerships and that trainings should target both insurers and regulators.

**Increase green competitiveness and innovation through climate-related investments while protecting industries against climate impacts.** To remain competitive, industries and markets need to engage in sustainable practices and solutions, and the World Bank should help. In Sub-Saharan Africa, the need for economic growth is putting pressure on scarce resources, such as water. In Ethiopia, the World Bank is investigating how the textile industry can retain competitiveness while growing sustainably. This can also help Ethiopia enter European markets, which require higher standards on environmental compliance. In Mauritania, a cross-World Bank team is exploring ways to improve fish stock in Western Africa, while diminishing fish waste further down the value chain.

Industries are at risk from the increased frequency of natural disasters, which directly affects their competitiveness and global value chains. Globally, economies are losing around US\$330 billion annually due to climate disasters. In Africa, where industries are emerging, these impacts could be exacerbated in sectors such as tourism and agribusiness. Concrete measures can ensure that industry practices are changed and adapted. In Senegal, the World Bank is supporting a coastal reclamation project to secure the tourism industry. The World Bank has also launched a global study on identifying better methods of resilience in industries.

Public and private sectors are leveraging entrepreneurship to grow climate technology markets, and entrepreneurs have deployed innovative climate technology solutions in LICs. The World Bank supports the deployment of climate innovation centers and climate venture funds in Africa to provide the technical and financial resources that entrepreneurs need to start and grow their businesses. By 2030, the objective is to develop 20 country programs that integrate green competitiveness into their growth strategies.

## 16. Strategic and Systemic Engagement for NDCs

**The landmark 2015 Paris Agreement set the course for a global effort to combat climate change and adapt to its effects.** It outlines enhanced support to assist low-income countries (LICs) achieve their Nationally Determined Contributions (NDCs). NDCs embody efforts by each country to reduce national emissions, adapt to climate change impacts, and meet its SDGs. Each Party is committed to prepare, communicate, and maintain successive NDCs that it intends to achieve. It is not, however, guaranteed that these national commitments will add up to the global targets.

The IPCC 1.5°C Special Report (2018) states that the ambition level in NDCs falls short of countries keeping under 1.5°C. The intensification of the pace and scale of climate impacts, which could be felt as early as 2030, will be particularly challenging in the context of Sub-Saharan Africa, where many countries have low capacities, yielding them especially vulnerable.

Enhanced support for climate action is critical, because resilience to climate variability and change is vital to the region's ability, among others,<sup>15</sup> to reduce poverty and protect hard-earned development progress. Forty-eight countries have communicated their post-2020 climate commitments and priority areas through their NDCs, including mitigation and adaptation actions. Countries are further expected to resubmit their NDCs in 2019 as part of a five-year cyclical, procedural (and legally binding) review in 2020.

Countries must raise their level of ambition on NDCs, transform priorities and plans from paper to action, and shift to low-carbon, climate-resilient pathways. Governments need to embed and institutionalize climate considerations at national, regional, and local levels and across all sectors into planning and delivery mechanisms. They must address critical policy reforms and incentives to accelerate toward green economies.

The new Africa Climate Business Plan (ACBP) component Strategic Support for NDCs seeks to mainstream climate change by expediting institutionalization of climate action for transformation at scale: across a country's sectors and regions. This focus on the implementation of NDCs and country climate policies through direct client engagement will complement the Bank's tactical upstream engagement; it is consistent and responsive to the Bank's Corporate Post-2020 and Adaptation Action Plan, which calls to enhance mainstreaming and implementation of NDCs. Key action areas and outcomes are summarized in table 16.1.

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15 Examples include improving project quality, a reduction in corruption (as reflected in the Corruption Perception Indices of Transparency International), and a removal of business distortions as measured by the World Bank Doing Business Indicator database.

Table 16.1: Strategic and Investment Engagement in NDCs

Activities	Expected outcomes		
	Fast track (by 2023)	Longer term (by 2026)	Cost (US\$)
<ul style="list-style-type: none"> <li>Integrate NDCs in SCDs and upstream analytics.</li> </ul>	<ul style="list-style-type: none"> <li>100%</li> </ul>	<ul style="list-style-type: none"> <li>100%</li> </ul>	<ul style="list-style-type: none"> <li>100,000 per SCD</li> </ul>
<ul style="list-style-type: none"> <li>Deepen integration of NDCs and climate actions into CPFs through assessments.</li> </ul>	<ul style="list-style-type: none"> <li>20% CPFs with NDC goals in results framework</li> </ul>	<ul style="list-style-type: none"> <li>40% CPFs with NDC goals in results framework</li> </ul>	<ul style="list-style-type: none"> <li>30,000 per CPF</li> </ul>
<ul style="list-style-type: none"> <li>Develop project pipelines corresponding to needs and priorities in the CPF supporting NDC implementation.</li> </ul>	<ul style="list-style-type: none"> <li>15% projects with direct linkages to NDC implementation goals</li> </ul>	<ul style="list-style-type: none"> <li>30% projects with direct linkages to NDC implementation goals</li> </ul>	<ul style="list-style-type: none"> <li>200,000 per investment</li> </ul>
<ul style="list-style-type: none"> <li>Mainstream and institutionalize country-level NDC engagement with ministries of finance and planning to mainstream and institutionalize climate change based on country demand.</li> </ul>	<ul style="list-style-type: none"> <li>Five countries where the WBG is engaged in country NDC strategic dialogue and TA</li> </ul>	<ul style="list-style-type: none"> <li>10 countries where the WBG is engaged in country NDC strategic dialogue and TA</li> </ul>	<ul style="list-style-type: none"> <li>1 million to 5 million per country engagement and TA</li> </ul>
<ul style="list-style-type: none"> <li>Conduct sectoral and strategic assessments and TA support based on country demand.</li> </ul>	<ul style="list-style-type: none"> <li>Five countries where the WBG is supporting assessment and TA</li> </ul>	<ul style="list-style-type: none"> <li>10 countries where the WBG is supporting assessment and TA</li> </ul>	<ul style="list-style-type: none"> <li>300,000 to 500,000 per country</li> </ul>
<p><b>Partners</b></p> <p>Ministries of finance, planning, environment, and line agencies, NDC Support Facility, NDC Partnership, bilateral aid agencies</p>	<p><b>Resource mobilization</b></p> <p>US\$8 million to US\$10 million per year for fast track; US\$15 million to US\$20 million per year for longer-term track.</p> <p>Sources: NDC Support Facility; others: bilateral funds, PPIAF, other trust funds.</p>		

The African region is making important strides on linkages with NDCs at multiple levels, with broad geographical coverage. One route is through Systematic Country Diagnostics (SCDs) and Country Partnership Frameworks (CPFs). Projects are supporting the implementation of countries' NDCs through linkages at strategic, project, or results framework levels. There is also client engagement through policy dialogue and linkages with investments.

**The ongoing process of NDC reviews offers further opportunities for support, revision of current ambitions of country targets, and enhanced quality of implementation roadmaps.** By 2020, countries will need to report on their NDC progress and raise the ambition of their commitments, if needed, to meet the goal of a 2°C world under the Paris Accord. As we transition closer to this deadline, the World Bank needs a better reflection on how its projects are linked and contribute to NDCs. A revised reporting will allow countries to assess gaps and opportunities to support prioritization of the World Bank's pipeline. In addition to engagement through project planning and design processes, there is considerable scope for assisting African countries to establish key "soft component" activities needed for the implementation of their NDCs, including the establishment of robust institutional frameworks and coordination mechanisms; development of measuring, reporting, and verification (MRV) systems for emission reductions targets; development of NDC implementation and investment plans; and mobilization of climate finance, including the private sector, for adaptation and mitigation actions.

The Bank's engagement with at least eight countries in the region is addressing these issues (table 16.2). Ongoing work in Uganda—the first African country to have an NDC Partnership Plan to mainstream climate-budget tagging and climate-risk screening into national processes—has the potential to transform and institutionalize climate action at scale.<sup>16</sup>

**As an implementing partner of the NDC Partnership,<sup>17</sup> the World Bank supports countries' access technical assistance (TA) and financial support for climate-related commitments set out in their NDCs.** The World Bank has established the NDC Support Facility and Climate Action Peer Exchange<sup>18</sup> to support NDC implementation (box 16.1). In addition, the World Bank is part of the Invest4Climate platform, which aims to accelerate transformative climate action.<sup>19</sup>

### Box 16.1 World Bank Support to Initiatives Supporting NDCs

The World Bank Nationally Determined Contribution (NDC) Support Facility was established as a trust fund in 2016, with an initial contribution from the German government in the amount of €23 million. The trust fund supports TA, capacity development, and coordination in support of NDC implementation. The NDC Support Facility has allowed the Bank to promote rapid progress to build NDC implementation momentum in NDCP member client countries, and to support improved cooperation with development partners.

The Climate Action Peer Exchange (CAPE) initiative is a forum for peer-to-peer learning, knowledge sharing, and mutual advisory support. The CAPE initiative will facilitate the efforts of finance ministries to design effective climate change adaptation and mitigation strategies consistent with the achievement of the NDCs. Its focus areas include, but are not limited to, fiscal instruments for low-carbon growth, macroeconomic modeling, fiscal risk assessments, public investment planning, and climate budgeting.

a. See the CAPE website, <https://www.cape4finance ministry.org>.

16 The project is working under the leadership of the Ministry of Finance, the National Planning Authority, and the Climate Change Department.

17 The NDC Partnership is a coalition of countries and institutions working to mobilize support and achieve ambitious climate goals while enhancing sustainable development. More information at the NDC Partnership website, <http://ndcpartnership.org>.

18 See the Climate Action Peer Exchange website, <https://www.cape4finance ministry.org>.













19 See the "About Invest4Climate" web page at <https://www.worldbank.org/en/topic/climatechange/brief/mobilizing-finance-for-climate-action-through-the-invest4climate-platform>.

**Table 16.2:** Ongoing Client Engagement on NDCs

<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 20%;"> <p> Adaptation</p> <p> Mitigation</p> <p> Cross-cutting</p> </div> <div style="width: 15%;"> <p> Agriculture</p> <p> Energy</p> </div> <div style="width: 15%;"> <p> Environment</p> <p> Social &amp; Urban Development</p> </div> <div style="width: 15%;"> <p> Macroeconomics, Trade &amp; Investment</p> <p> Transport</p> </div> <div style="width: 15%;"> <p> Water</p> <p> Forestry</p> </div> </div>		
Country	Value added of WBG engagement (strategic: supports SCDs/CFPs, policy dialogue, investments, other)	Sectors
Rwanda	Policy dialogue, Investments across forests/landscapes, climate resilient agriculture, sustainable energy	
Côte d'Ivoire West Africa Coastal Areas Resilience Investment Project (US\$250,000) Achieve the 42% Renewable Energy Target (US\$250,000)	Policy dialogue, private sector convening, technology specific advisory experts, link to investments  The WBG, through the WACA program, is supporting the Ministry of Environment and Sustainable Development to respond to the NDC priority on coastal resilience. The WBG has supported multisectoral consultations, regional dialogue with countries that face similar coastal threats, and investment preparation to build coastal resilience.	IFC
Mali	Supporting Ministries of Agriculture and Livestock, and the Environment and Sustainable Development Agency with the preparation of a CSAIP, and multisectoral consultations and regional dialogue; benefiting from support and in-kind contribution from the CGIAR CCAFS program in CSAIP design.	
Namibia	To inform ongoing SCD development, forthcoming CPF, and NDP; to mainstream integrated landscape management (including natural resources, agriculture, and water) for increased resilience, production, and ecosystem services (biodiversity, erosion control, water quality, and quantity).	
STP Targeted Support toward Building Climate Resilience (US\$300,000)	The WBG is a key player supporting the work of the NDC partnership, building on the experience gained during of the Multi-Sector Investment Plan for coastal resilience and the current implementation of the project financed by the NDC SF. The Web-GIS platform under preparation will make available flood maps for current and future climate, land use evolution, and other georeferenced information, including the project portfolio for climate resilience in STP. This tool will allow national institutions and development partners to plan for risk-informed investments in a more coordinated manner. In addition, the WBG is creating a more dynamic cooperation among international development partners (e.g., coordination and collaboration between EU-funded project and the WBG).	



Table 16.2: Ongoing Client Engagement on NDCs (continued)

		
Country	Value added of WBG engagement (strategic: supports SCDs/CFPs, policy dialogue, investments, other)	Sectors
Uganda (US\$500,000)	Mainstreaming of climate through customization, training, and institutional roll out of climate risk screening and climate change budget tagging and expenditure tracking tools (national budget system) in support of NDP (II) and forthcoming NDP III and the budget systems; and support to high priority bankable projects (including Albertine Land Management).	  
Mozambique (Adaptation Investment Framework and Improving MRV for NDC) (US\$400,000)	Policy dialogue and improved coordination and communication with partners and between sectors to inform the government's next five-year plan with streamlined resilient and low-carbon financable policies. Linking land use planning processes and an ILFM approach to sustainable and resilient use of land and natural resources. Supporting the government through the National Disaster Management Institute to identify risk areas, develop resilient infrastructures, and develop a more appropriate legal framework and a supporting Disaster Risk Management national fund. Working in close collaboration with SIDA and KFW (added agriculture, water and social and urban development).	 
Zimbabwe	Policy dialogue investment planning for CSA and forestry.	  
Kenya	Upstream dialogue. To inform forthcoming SCD/CPF and NDC; links with investments (marine fisheries), and county devolution climate change mainstreaming TA.	  

# 17. Harnessing Satellite Technology for Climate Resilience

## Value Added of Earth Observation Data and Services

Climate observations and risk screening are the basis for scientific understanding, detection of anomalies and hot spots, validation of models, and prediction of climate impacts. Therefore, they are one of the key foundations for managing risks. Decision makers require accurate, consistent, and timely information about the state of our changing environment and its evolution to form and inform adaptation and mitigation strategies. Earth observation (EO) from space supports this endeavor because satellites can deliver the comprehensive, global, and consistent datasets needed for climate observation, research, and services.

EO is the technique for gathering of information about Earth's physical, chemical, and biological systems. It involves monitoring and assessing the status of, and changes in, the natural and humanmade environment. EO data are best suited for climate resilience decision making because they:

- Offer manifold possibilities for monitoring climate-induced environmental changes.
- Complement existing climate data or substitute for nonexistent data;
- Are useful for gathering homogenous, high-resolution, long-term, time-regular global information, including on regions not easily accessible or with safety concerns.
- Provide the basis for establishing sectoral baselines (agriculture production areas, water availability, energy production, infrastructure).
- Provide invaluable information about hazards, but also the exposure and vulnerability of humans and their assets.
- Feature higher resolutions with regard to model data, which are spatially uniform compared to sparse ground measurements.
- Are capable of providing near-real time observations.

Accurate quantification of climate change–induced natural hazards' intensity, vulnerability, and exposure of populations and assets is a necessary element of climate resilience. Recent Intergovernmental Panel on Climate Change (IPCC) reports advocate for a science-based, evidence-based risk approach for informed decision making under uncertainties, to design robust early warning systems, and to define an optimal safety net to transfer risks away from climate-sensitive sectors. By increasing access to geospatial information and data, EO services can support decision makers in addressing the recurrent challenges they face in risk assessment, medium- and long-term planning, climate monitoring and forecasting, and assessing development priorities.

## Harnessing EO Technology for Africa

Using EO data from satellites in building resilience to climate change and climate variability is of particular interest for Africa due to the scarcity of quality data to assess the climate risks and potential impacts on the ground. Measures of vulnerability, hazards, and exposure rely on ground-based measurements or modelled data, which is not sufficient. Ground-based measurements provide the most direct way of measuring climate indicators at the surface. Ground-based observation networks report inadequate coverage in Africa both spatially (i.e., the density of stations) and temporally (i.e., intermittent, erratic recordings). Meanwhile, modelled datasets do not adequately resolve local conditions to allow local analyses and are often representative only for large-scale phenomena.

**Table 17.1:** Expected Outcomes of World Bank Support to Harnessing Satellite Technology for Climate Resilience

Activities	Expected outcomes		
	Fast track (by 2023)	Longer term (by 2026)	Cost (US\$)
<ul style="list-style-type: none"> <li>Conduct capacity building, raise awareness about climate resilience goals, learn about user requirements within Africa, and train hosted trainees on use of EO-based climate service platform.</li> <li>Conduct demonstrations of the value added services of the proposed solution with cases developed with stakeholders (e.g., International Financial Institutions, national hydrological and meteorological [hydromet] agencies) and innovators (e.g., citizens, entrepreneurs) to derive high-level data products supporting the monitoring and management of climate change risks.</li> <li>Increase access to geospatial information and data to support decision makers in challenges facing risk assessment, medium- and long-term planning, climate monitoring and forecasting, and assessing their development priorities.</li> </ul>	Deliver five workshops, online trainings.	Deliver 10 workshops, online trainings.	Deliver 15 workshops, online trainings.
	Conduct three demos, with potential for scale-up.	Conduct 10 demos, with potential for scale-up.	Conduct 20 demos, with potential for scale-up.
	Provide access to 10 countries, institutions, agencies to geospatial information.	Provide access to 15 countries, institutions, agencies to geospatial information.	Provide access to 20 countries, institutions, agencies to geospatial information.
<b>Main partners</b>	<b>Resource mobilization</b>		
ESA EO4SD, IGAD ICPAC	See table 17.2 Resources to be mobilized (initial target US\$2 million to US\$3 million)		

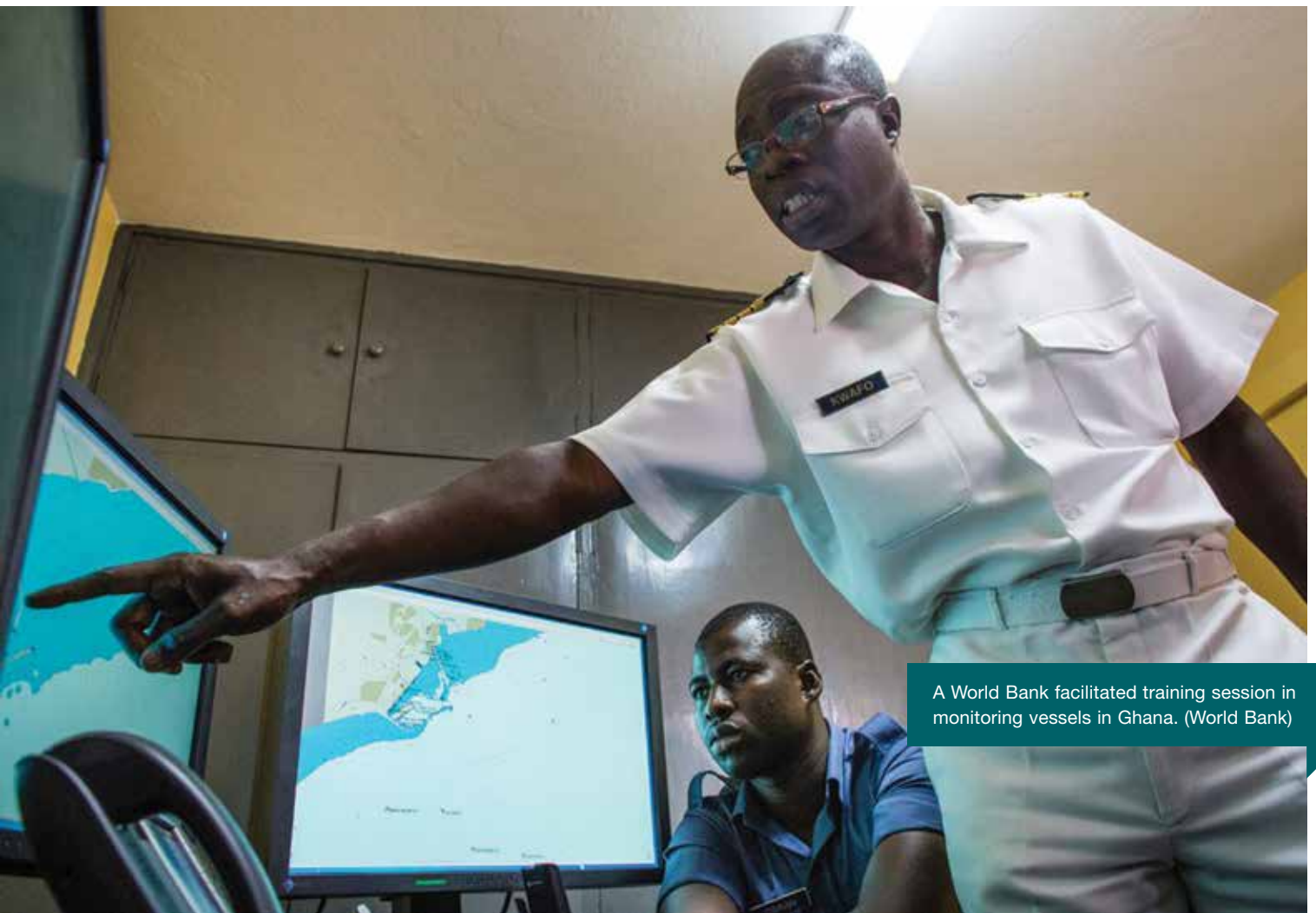
EO applications, which are now available through open and free access data, can be used for monitoring and implementing climate change adaptation solutions in Africa, integrated with already existing data sources, provided investments are made in enhancing critical capacities. Table 17.1 highlights priority activities and outcomes, through capacity building and applications, to integrate EO-based, socioeconomic, and other relevant data to achieve a holistic view of climate-related risks.

In several African countries, including in the Horn, safety net programs have been scaled up to respond to shocks, based on early warning information ranging from the use of seasonal assessment and humanitarian appeals to the creation of new triggers based on data from satellites (box 17.1).

### **Box 17.1 Mobilization of Safety Nets through Use of Satellite Data Saves Lives**

In the Northern Uganda Social Action Fund (NUSAF) III program, the World Bank collaborated with the Government of Uganda to access financial resources from the IDA, totaling US\$130 million, with US\$12 million specifically dedicated to the Disaster Risk Financing Component. An index of satellite-based observations of ground vegetation was used as an indicator of drought conditions and triggered a scale-up.

The data source used to trigger a response must be independent and objective, because they are part of a transparent, rules-based approach to when, and how extensively, a safety net program expands. An objective indicator is needed for the impact of a crisis on household welfare, with a predefined threshold to trigger response. There should be agreement in advance on how many households will benefit from support, in what regions, and for how long. This avoids politicization of response, which can lead to costly delays.



A World Bank facilitated training session in monitoring vessels in Ghana. (World Bank)

Earth Observation for Sustainable Development (EO4SD) Marine and Coastal Resources Management cluster (table 17.2) focuses on coastal and marine issues to develop and demonstrate a portfolio of EO-based information services. These can be embedded into investment projects funded by the World Bank and other financial institutions. EO climate services will focus on coastal dynamics such as bathymetry, coastal erosion, and sedimentation; coastal environment such as water quality and pollution detection; marine and coastal surveillance, and support to the blue economy development (aquaculture, tourism, transport, energy).

**Table 17.2:** World Bank Support to Marine and Coastal Resources Management

Activities	Expected outcomes		
	Fast track (by 2023)	Longer term (by 2026)	Cost (US\$)
<ul style="list-style-type: none"> <li>• Map coastal bathymetry. Produce freely available Sentinel-2 imagery (10 m resolution). It can cover relatively large areas with consistent methodology and at the required frequency.</li> <li>• Increase access to geospatial information and data for sediment/erosion control, coastal changes mapping, water quality data, coastal land cover, and land use.</li> <li>• MSP support. Provide information on ecosystem status, physical parameters, and the interests of economic actors.</li> <li>• Increase access to geospatial information and data for multihazard risk assessment to support decision makers in medium- and long-term planning, forecasting, and assessing development priorities.</li> <li>• Establish ground-based observations networks to manage spatial- and ground-based data.</li> <li>• Train national and regional entities on the use of EO-based information, technical aspects of data processing, analysis, mapping, and results interpretation.</li> </ul>	Provide access to five to 10 countries, regional institutions, and agencies to bathymetry information at 10 m resolution.	Higher-resolution bathymetry dataset available for regional and national agencies.	10+ countries have regular access and capacity to analyze EO-based data.
	Provide access to five to 10 countries to data and information.	Five to 10 countries are producing analysis, key information, and recommendations on coastal environment status.	Establish self-sustaining regional and national ground-based observation networks.
	Hold one to two workshops per year in the region.	Three to six countries have capacity generation on MSP.	Regional and national experts and trainees transfer knowledge.
	Provide access to information to land and environmental planners.	Four to six countries develop information and analysis for coastal zone management with ground information.	
	Countries support training and data acquisition for regular coastal observation and monitoring techniques.	Generate capacity in six to 10 countries to generate analysis and reports on state of coastal and marine zones using ground and spatial data.	
	Support three to six countries' networks for collection, processing, and production data and information.	National and regional experts provide training and lead workshops in using EO-based information.	
	One to two workshops per year.		
	One to three national and academic personnel trained on EO monitoring techniques and analysis per country.		

## **Box 17.2 Regional and collaborative action through West Africa Coastal Observatory**

Since 2011, the West African coastal countries have been developing the West Africa Coastal Observatory. The West Africa Coastal Areas (WACA) program has financed its establishment and operation. The project was coordinated by the Centre de Suivi Ecologique, CSE, in Dakar, with assistance of the West African Monetary and Economic Union and the International Union for the Conservation of Nature (IUCN), and built around the West African Coastal masterplan (Schéma Directeur du Littoral d'Afrique de l'Ouest-SDLAO), updated in 2016.

There has been multicountry and multipartner support for the WACA program, following its launch in November 2018. The WACA preparation phase mobilized technical and financial partners to ensure scaling up and reinforcement. The WACA program intends to link national coastal observation initiatives and international technical expertise as decision supporting tools for coastal resilience.

A November 2018 event organized by the Ecological Monitoring Center (CSE) brought together WACA countries and international specialized institutions, including the European Space Agency and French technical institutions (Centre d'Études et d'Expertise sur les Risques, l'Environnement, la Mobilité et l'Aménagement [Center for Studies and Expertise on Risks, the Environment, Mobility and Development], Bureau de Recherches Géologiques et Minières [French Geological Survey], Institut national de l'information géographique et forestière [National Geographic Institute], and Service hydrographique et océanographique de la Marine [Naval Hydrographic and Oceanographic Service]). Experts presented their achievements in coastal observation and outlined activities under the WACA program to improve the efficiency of coastal observation in West Africa. Participants agreed to establish a regional coastal observatory mechanism in West Africa and to set up a mechanism for monitoring its development involving the CSE, the international technical assistance, countries involved in the WACA Resilience Investment Project (ResIP), and other West African coastal countries.



Cashews are a highly valued crop in West Africa; current projects are funding the processing industry in West Africa, particularly in Côte d'Ivoire. (World Bank/Arne Hoel)



# Part III:

# Forward Look

## 18. ACBP Raising the Level of Ambition

### Unified Climate and Development Agendas in Sub-Saharan Africa

**Development and climate change in Sub-Saharan Africa (SSA) are inextricably linked, more so than in any other part of the world.** Climate action cannot be divorced from the development agenda, especially in Africa. This has been the driving force of the Africa Climate Business Plan (ACBP), the Bank's platform for climate engagement on the continent.

**In light of the analysis in the IPCC 1.5°C Special Report (2018), the race to resilience for Sub-Saharan Africa is that much harder.** If the global community cannot keep warming to below 1.5°C, there are fewer than 12 years to ramp up on resilience. The stakes are high. Harnessing the returns on resilience planning and achieving transformation at scale continues to be challenged by limitations in resources and competing investments. The good news is that the region is not starting from zero; the bad news is that the current pace of climate action is far from sufficient.

**This section sets out action lines for scaled-up and transformational climate action in Sub-Saharan Africa to act with urgency in the face of escalating risks from climate impacts** and limited progress in reducing greenhouse gas (GHG) emissions asset out in the Paris Agreement. The climate challenges—and the unfolding of other megatrends, including urbanization and demographic increases—amplify the call for concerted climate and development action to secure and sustain development gains. This broader context, coupled with the progress to date and emerging lessons from the ACBP portfolio, have helped shape this section and the new levels of ambition moving forward. This Forward Look is strongly aligned with the World Bank's 2025 Targets to Step Up Climate Action and the World Bank Adaptation and Resilience Action Plan.

#### Current Climate Context

**The warming over the last 50 years and the increase of global mean temperatures of 1°C has challenged economies and communities in Sub-Saharan Africa.** Climate-related impacts acting, for instance, through drought, water stress, agricultural productivity losses, and health issues, affect every fabric of society, but especially poor populations,

which continue to rely on rainfed cropping and pasture-based livestock systems in much of the region. Meanwhile, coastal areas of eastern and western Africa have some of the highest rates of population growth and urbanization, and they will experience even higher degrees of exposure to coastal hazards (Neumann et al. 2015). Although the region is blessed with a huge, untapped potential for renewable energy from low carbon sources, including hydroelectric, solar, and geothermal power, two out of three people in Africa, or about 600 million, still lack access to electricity. This dearth of energy access, coupled with rampant power shortages, further exacerbates the vulnerability and livelihood security of millions of people, as well as economic progress at large.

**Climate drivers are involved in most of the shocks that keep or push African households into poverty.** Between 1990 and 2013, almost 43 percent of the drought events recorded in the EM-DAT<sup>21</sup> database occurred in Sub-Saharan Africa. Climate projections suggest that rainfall variability is likely to increase over the coming decades, impacting food security, mobility, and infrastructure. Extreme weather and climate events, interacting with exposed and vulnerable human, natural, and infrastructure systems, can lead to disasters and disruptions in critical services. Natural hazards and disasters triggered significant displacement in Sub-Saharan Africa in 2017, forcing almost 2.6 million people to flee their homes (IDMC 2018). Drought triggered most of the 434,000 displacements recorded in Ethiopia; Cyclone Enawo displaced 247,000 people in Madagascar; floods displaced 189,000 in Niger; and Cyclone Dineo, most of the 170,000 in Mozambique. Other countries affected by disasters were Nigeria (122,000), Uganda (95,000), and Malawi (84,000). There were also 5.5 million new displacements associated with conflict and violence in 2017, double the figure for the previous year. If unaddressed, poverty, vulnerability, conflict, and climate change could put more people at risk, especially in the face of high population growth and increasing urbanization rates, which are predicted to continue to increase dramatically in the coming decades.

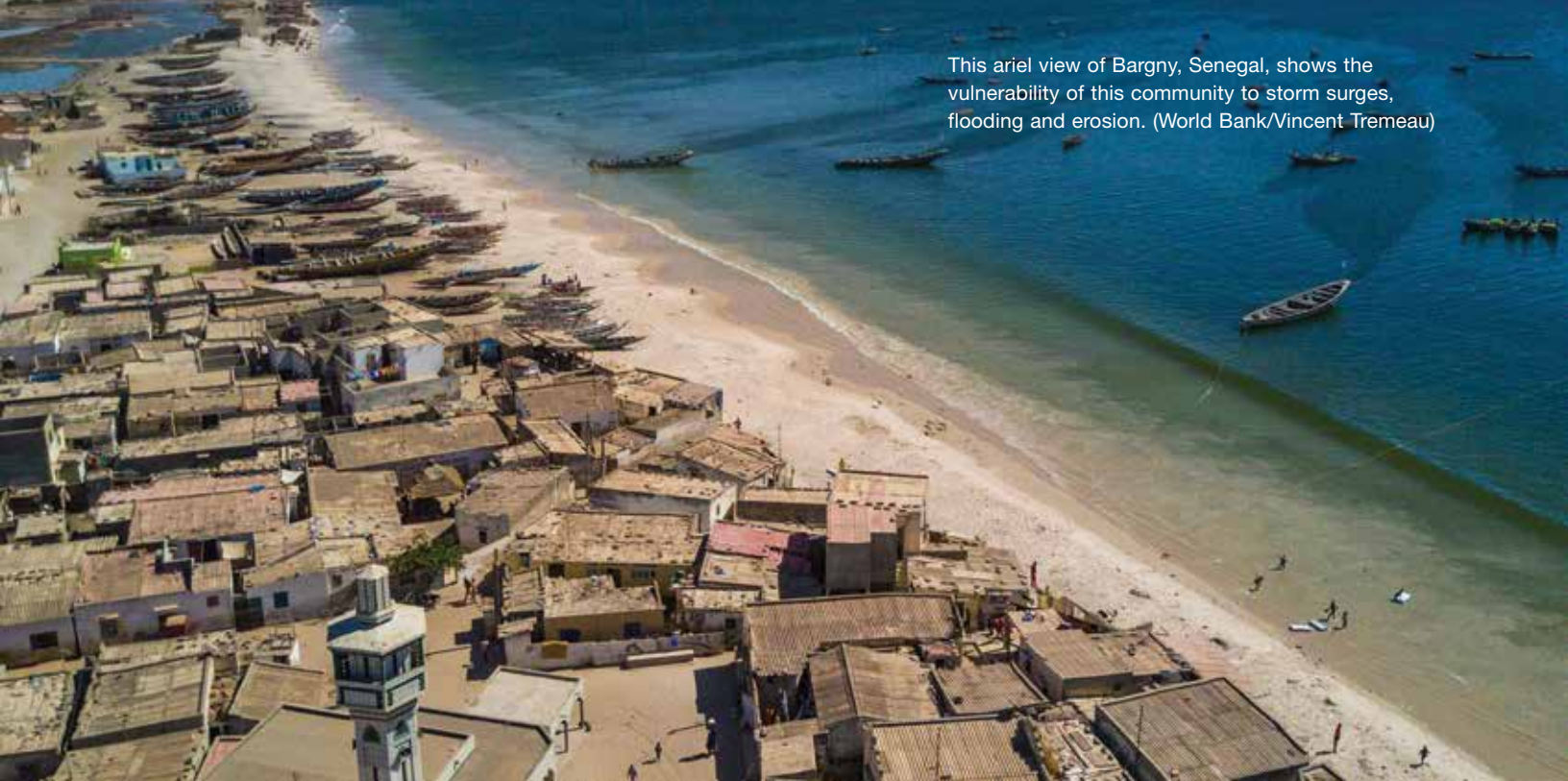
### Predictions of Intensified Climate Impacts in the Next Few Decades

**The IPCC Special Report (2018) issues a dire warning on the widespread nature of climate impacts that will unfold in the coming two decades. It underscores the urgency for climate action to reduce the global emissions and get on a pathway to limit warming. The report, underpinned by scientific research and analysis,** states with high confidence that human activities are estimated to have caused approximately 1.0°C of global warming above preindustrial levels (likely range of 0.8°C to 1.2°C), and that this warming is likely to reach 1.5°C between 2030 and 2052 if human activities increase at the current rate (IPCC 2018) (figure 18.1). Global net emissions of carbon dioxide would need to fall by 45 percent from 2010 levels by 2030 and reach net zero around 2050 to keep the warming around 1.5°C. Unfortunately, current emission pathways are on track to deliver warming closer to 3°C. Scientists suggest, with high confidence, that climate-related risks for natural and human systems are higher for global warming of 1.5°C than at present, but lower than at 2°C.

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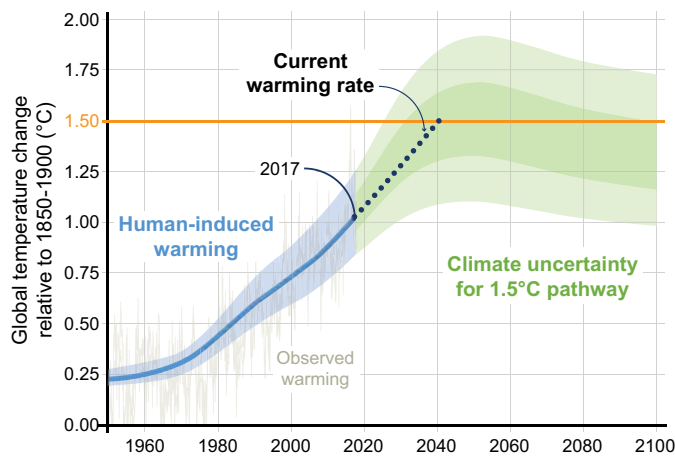
21. See the Centre for Research on the Epidemiology of Disasters database, available at [www.emdat.be/database](http://www.emdat.be/database).





This aerial view of Bargny, Senegal, shows the vulnerability of this community to storm surges, flooding and erosion. (World Bank/Vincent Tremeau)

Figure 18.1: Human-Induced Warming Rates to Projected 1.5°C Increase



Source: IPCC 2018.

Note: Human-induced warming reached approximately 1°C above preindustrial levels in 2017. At the present rate, global temperatures would reach 1.5°C around 2040. The stylized 1.5°C pathway shown here involves emission reductions beginning immediately, and CO<sub>2</sub> emissions reaching zero by 2055.

**There is mounting concern that current global action on mitigation may not be adequate to meet the central tenet of the Paris Agreement:** to keep the global temperature rise of this century to well below 2°C above preindustrial levels (and limit the temperature increase even further to 1.5°C). The stark warning of the IPCC Special Report (2018)—that warming beyond 2°C would significantly increase the risks and impacts of climate change compared to 1.5°C warming, and of some irreversible consequences being set in motion—cannot be ignored. Key messages are highlighted in box 18.1.

### Box 18.1 Key Messages from the IPCC Special Report, Global Warming of 1.5°C

- **There is high confidence that climate-related risks for natural and human systems are far greater at global warming of 2°C than for 1.5°C.** At current levels of warming, the world would reach human-induced global warming of 1.5°C between 2030 and 2052. Impacts on terrestrial, freshwater, coastal, marine (and fisheries) ecosystems, and biodiversity, and in some regions, including drylands, and low-income countries (LICs), will be lower at 1.5°C compared to 2°C.
- **Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.** Extra warming on top of the approximately 1°C we have seen so far would amplify the risks and associated impacts, particularly for poor households, and possibly increase the total number of people living in poverty. Vulnerable populations and communities dependent on agricultural or coastal livelihoods are disproportionately at risk at warming of 1.5°C and beyond.
- **In model pathways to keep within a 1.5°C warming, global net anthropogenic CO2 emissions would need to decline by about 45 percent from 2010 levels by 2030, reaching net zero around 2050.** There is no definitive way to limit global temperature rise to 1.5°C.
- **Countries' current pledges to reduce their emissions**, as set out in the national determined contributions (NDCs), are not in line with limiting global warming to 1.5°C; they are closer to 3°C.
- **The potential for climate-resilient development pathways differs among regions and nations, due to different development contexts and systemic vulnerabilities.** Enhanced efforts should involve strengthened and timely actions across the board. The avoided climate change impacts on sustainable development, eradication of poverty, and reducing inequalities would be greater if global warming were limited to 1.5°C rather than 2°C, and if mitigation and adaptation synergies were maximized and trade-offs minimized.

According to *The Changing Wealth of Nations*, some LICs—especially in Sub-Saharan Africa—saw a decline in per capita forest and agricultural land wealth (Lange, Wodon, and Carey 2018). **Although the growth of wealth from 1995 to 2014 in many Sub-Saharan African countries matched that of other regions, rapid population growth outpaced investment. This degradation of natural resources and the mounting evidence of impacts of climate change on water, drylands, cities, agriculture, and migration will have grave consequences on Africa's development.**

**Uncharted Waters discusses how the impacts of water scarcity and drought may be even greater, causing long-term harm in ways that are poorly understood and inadequately documented (Damania et al. 2017).** The study shows that in rural Africa, women born during severe droughts bear the marks throughout their lives, growing up physically shorter, receiving less education, and ultimately becoming less wealthy. And these impacts can lead to harmful intergenerational consequences for their offspring: their children are more likely to suffer from malnutrition, which leads to additional health challenges.

**Meanwhile, vulnerability in drylands is rising and will jeopardize livelihoods of millions is a key message of *Confronting Drought in Africa's Drylands* (Cervigni and Morris 2016). In the absence of significant outmigration, by 2030, the population living in rural areas**

**of the dryland countries is projected to grow by 15 percent to 100 percent (depending on the country). The number of farming-dependent households in the Sahel and the Horn of Africa that are poor and vulnerable to droughts and other shocks** is projected to increase by around 60 percent. The study underscores that sustainable management of drylands through resilience enhancement of inhabitants is key. Improved crop production technologies can deliver sizeable resilience benefits by boosting productivity in rainfed agriculture, and the number of drought-affected poor households could be reduced by 10 percent to 80 percent compared to a business as usual (BAU) scenario, depending on the country and aridity zone as well as the effectiveness of agricultural development.

**While interventions are needed to help communities adapt in place through concrete climate and development action, the Bank's flagship report *Groundswell: Preparing for Internal Climate Migration* (Rigaud et al. 2018) projects that, by 2050, the number of climate migrants in Sub-Saharan Africa could reach up to 86 million** under the pessimistic reference scenario. West Africa, projected to reach more than 50 million climate migrants, will be most affected, followed by East Africa (10 million). The numbers of climate migrants will ramp up between 2020 and 2050, and the region will see an emergence of hotspots of climate in- and outmigration as a consequence of lower water availability and crop productivity and from areas affected by rising sea level and storm surges. Early and concrete inclusive development undertaken at local and national levels, coupled with global action to reduce GHG emissions, could reduce the number of climate migrants significantly in Sub-Saharan Africa, perhaps by almost 80 percent.

## Connections between African Megatrends and Climate Action

**By 2050, Africa will account for the highest population growth, with an additional 1.3 billion people, representing just over half of the added global population (UN 2017). The economic growth is driven by a surging population, increasing levels of education, and technology absorption.** Whether Africa's demographic transition is a dividend or disaster depends on how it harnesses key factors, including the youth bulge and the higher labor force participation of women. Sectors such as agriculture, which have traditionally absorbed the working population, will be increasingly challenged in the face of climate change.

**Investments in human capital—as an aggregation of education, skills, and health accumulated over lifetimes—can support countries to achieve their full potential of the economic productivity.** However, these investments must be made in the context of climate impacts, which can undermine the gains across generations. With the right training and education skills, robust adaptive capacities in strong economies are a better place to plan for, implement, and address climate impacts across sectors and geographies. Poor people's adaptive capacity is often undermined by lower education levels; limited access to resources and alternative livelihood options; discriminatory social norms that affect individuals' access to labor markets and decent work; and a lack of long-term institutional planning, policy, and programmatic support for resilience strengthening activities (ISDR 2009). Family



coping strategies, such as withdrawing children from school or marrying off daughters to reduce the number of mouths to feed (or to bring new assets into the household), jeopardize the well-being of children (World Bank 2014) with intergenerational consequences.

**If the negative consequences (e.g., increased rates of malnutrition, lost educational opportunities) become more common, climate change could lead to an increase in intergenerational poverty cycles (Harper, Marcus, and Moore 2003), thus compounding** vulnerability to climate change. In Africa, the proportion of undernourished children and those suffering from moderate and severe stunting is projected to decrease without climate change, but will increase with climate change, with the most significant increase of 31 percent to 55 percent for severe stunting (World Bank 2013). Loss of human development opportunities in childhood can have lifetime consequences. Evidence from Zimbabwe, for example, indicates that children affected by drought and food insecurity in infancy never catch up on lost growth (Hoddinott and Kinsey 2001).

**The Program for Infrastructure Development in Africa (PIDA) 2012 called for a major scale-up of infrastructure capacity and improved maintenance across the continent's major river basins.** It is estimated that power demand will increase to more than 3,100 terawatt hours by 2040; corresponding transport volumes will increase six to eight times, with a particularly strong increase of up to 14 times for some landlocked countries. Water needs will push some river basins—including the Nile, Niger, Orange, and Volta basins—to the ecological brink. Information and communications technology (ICT) demand will swell by a factor of 20 before 2020 as Africa catches up with broadband. Hydropower capacity is planned to increase by a factor of six, and the irrigated area by 60 percent, but up to 700 percent in some basins (AUC, AfDB, and UNECA 2012). Ensuring that long-lived infrastructure is designed to standards that can withstand climate impacts and ensure delivery of services is critical for securing and sustaining resilience for the economies and communities at large.

**Urban populations in Africa will double over the next 25 years, from the current 472 million, as more rural migrants are pushed or drawn to cities (Lall, Henderson, and Venables 2017). The largest cities grow as fast as 4 percent annually. By 2050, 60 percent of the population in Sub-Saharan Africa will live in urban areas, compared to 40 percent today (UN DESA, 2014). Therefore, municipalities and their partners must address urban resilience (Carmin, Nadkarni, and Rhie 2012). There is a real opportunity for planning and infrastructure development to be climate-informed, since more than 60 percent of the land projected to become urban by 2030 has yet to be developed (World Bank 2015f).** Increased rural urban migration (including climate-induced migration) and increasing urbanization could, if managed well, be engines of transformation.

**Technology is an area of growth and opportunity.** While still below the global average of 65 percent, mobile subscriber penetration in Sub-Saharan Africa stood at 44 percent (444 million) by the end of 2017 and is expected to rise to 52 percent by 2050 (World Bank 2012). Smaller-scale applications, such as ICT-enabled services combined with mobile phone applications, can support knowledge sharing among people and communities to diversify livelihoods, reduce vulnerability, and build the capacity to respond quickly to changing

circumstances. Large-scale deployment of ICTs can include meteorological stations, sensor networks, and satellites, which can monitor and measure climate impacts. Satellite-based earth observation (EO) data can help to build resilience to climate change and climate variability; it is of particular interest for Africa due to the scarcity of quality data to assess the climate risks and potential impacts on the ground. If investments are made in enhancing critical capacities, these applications, which are available through open and free access data, can help to monitor and implement climate change adaptation solutions in Africa.

**ACBP climate actions should provide low-carbon and climate-resilient strategies to meet the challenges and opportunities in this larger context.** These strategies should help to support Sub-Saharan countries in meeting their Sustainable Development Goals (SDGs). This synergistic approach will guard against maladaptation or a lock-in to inappropriate adaptation options, while ensuring that adoption of low-carbon pathways can help countries to leapfrog into sustainable pathways across time scales and geographies.

## World Bank Group Post-2020 Climate Action and Targets

**In 2016, the Bank set a goal that 28 percent of its portfolio financing will be climate-related by 2020.** This led to concerted action across the institution to increase climate co-benefits through investments. Under this commitment, the Africa Region had a target of 22 percent, although in the last couple of years the delivery has reached 27 percent and 28 percent, respectively.

On the basis of the International Development Association (IDA) commitments, the Bank has increased climate mainstreaming through its country engagement instruments, such as Systematic Country Diagnostics (SCDs), Country Partnership Frameworks (CPFs), and links with NDCs, projects, and programs. This commitment was deepened and extended to IBRD countries through the Climate Change Action Plan (CCAP). The CCAP requires SCDs to examine the potential impact of climate change on future poverty reduction and consider adaptation priorities and implications of a country's energy mix and proposed shifts to a lower-carbon economy, as articulated in the NDC. CPFs are required to address climate change issues and risks and include links to NDC priorities.

**The World Bank Group's Corporate Post-2020 Climate Actions and Targets are in line with the Paris Agreement goals and respond to the urgency for climate action as called for by the IPCC Special Report (2018).** The targets and actions constitute the Bank's strategic directions and increased ambition during FY21–30 through (i) strengthening adaptation and resilience, (ii) mobilizing more finance for climate actions, and (iii) amplifying our impact on the ground with increasing emphasis on transformative investments. To this end, the Bank aims to make the strategic shifts from input-based to outcome-oriented, from a focus on internal mainstreaming to external outcomes at the country-level, and from making short-term effects to longer-term impacts. These targets and actions are structured around five themes:

- Scaling-up Finance for Climate Actions
- Strengthening Transformational Policies and Systematic NDC Support
- Investing for a Better-Adapted World
- Deepening Greenhouse Gas Accounting and Promoting Carbon Markets and Pricing
- Elevating Climate Impact in Priority Areas

**This Report is aligned with Corporate Post-2020 Climate Targets and Actions**

**and the Adaptation and Resilience Strategy.** Several of the actions and targets under the ACBP directly support and contribute to the Corporate commitment. The ACBP includes two time horizons (one for resource mobilization and another for the generation of results) with cut-off dates lined up with IDA replenishment cycles. These horizons correspond with the Corporate Post-2020 Climate Actions and Targets, which have a timeline of 2025. The FY20 timeline is for key upstream work (tools, diagnostics, assessments, case studies, assessments, and methodologies) (see table 18.1).

**Table 18.1:** Fast-Track and Longer-Term Phases of the ACBP and the WBG Corporate Post-2020 Climate Targets’ Timeline

Context	Goal	Fast track	Longer-term track
ACBP	Mobilize resources	June 2020	December 2024
	Generate outcomes	June 2023	June 2026
Corporate Post-2020	Generate outcomes	n.a.	By 2025

Note: n.a. = not applicable.

## Raising Our Ambition to the Closing Window or Opportunity for Climate Action

**While the results of the Special Report (IPCC 2018) represent a “new and even more compelling” wake-up call to expediently mitigate and adapt, it is equally important not to gloss over the realities faced by many countries in Sub-Saharan Africa.** These countries not only have to adapt to the 0.5°C increased warming over the last 50 years but also need urgently to prepare for the intensification of impacts, which could act as poverty multiplier within the next two decades. At the same time, recent research suggests that the number of people exposed and vulnerable to climate impacts will double with warming increases from 1.5°C to 2.0°C, with numbers being higher in Sub-Saharan Africa than in other regions (Byers et al. 2018).

**The global community must ramp up its mitigation action, and countries in Sub-Saharan Africa must raise their ambition levels on adaptation even as they pursue lower emission pathways.** Limiting the risks from global warming of 1.5°C in the context of sustainable development and poverty eradication implies system transitions. These can be enabled by an increase of adaptation and mitigation investments, policy instruments, the acceleration of technological innovation, and behavior changes.

**The ACBP Forward Look proposes three lines of action that seek to ramp up action and deepen engagement and support for transformational and scaled-up action.**

These action lines can help Sub-Saharan Africa become more resilient and adapt to the intensifying impacts and pace of a changing climate (box 18.2). The ACBP, now in its third year of implementation, is a robust platform to fortify and galvanize climate action. It is also a strong portfolio with emerging lessons from each ACBP component to help chart future actions. These three strategic areas align well with the Corporate Post-2020 targets and commitments, and the Adaptation and Resilience Strategy.

## Box 18.2 ACBP Forward Look and Urgency to Act

### Strategic and Systemic Engagement for NDCs

- Expediting institutionalization of climate action for transformation at scale, across sectors and geographies.

### Scaled-Up and Transformational Investments

- Sustained and upscaled focus on natural capital ACBP, powering resilience, climate-smart cities, and transport systems.
- Investing in human and social capital focused on health, education, and social resilience to short-circuit the intergenerational downward spiral from climate impacts.
- Mobilizing the private sector, and harnessing the momentum for Maximizing Finance for Development.

### Strengthening the Enabling Context

- Harnessing innovation and technology through building a green growth enabling context; and mobilizing satellite technology applications to leapfrog countries for climate resilience.
- Fostering platforms for climate knowledge and exchange.

### Raising Financing and Driving Innovations in Financing

- Resource mobilization for ACBP and closing the gap for resource needs.
- Mobilizing the private sector and innovations in financing.

## Strategic Support for NDCs

**Mainstream climate action through strategic country engagement.** The urgency for Sub-Saharan African countries to be prepared for more significant climate challenges and ramped-up global warming requires transformation at scale. The Bank must leverage its comparative advantage and portfolio of investments to support broader and more systemic shifts within countries. One strategy is through high-level ministries, which can embed and institutionalize climate-resilient and low-carbon considerations for accelerated action. This shift would build on the Bank's internal mainstreaming through its SCDs and CPFs, and increased linkages with NDCs through investments. The Africa Region is engaged in eight countries on their NDCs, but these and other countries will benefit from a more structured

approach to country engagement, including through dedicated resources. The proposed new ACBP component for Strategic and Systemic Country Engagement for NDCs will support these interventions and is aligned with the Corporate Post-2020 plan.

**The race to resilience requires systemic and transformational shifts at multiple levels and scaled-up investments. These must be** informed and underpinned by local development contexts and systemic vulnerabilities. Leap-frogging through shifts in policies, use of innovations and technologies, and engagement of all stakeholders—especially the private sector—to achieve climate-smart development is a crucial and indispensable part of the overall resilience strategy.

## Scaled-Up and Transformational Investments

**Strengthening resilience of natural systems.** The IPCC Special Report (2018) notes with high confidence that the vulnerability of natural systems—and of impacts on disadvantaged and vulnerable groups reliant on these systems—will intensify beyond 1.5°C warming. There has been a strong delivery within this cluster through Climate-Smart Agriculture (CSA), Integrated Watershed Management, Climate-Resilient Landscapes (Drylands and Forests), Coastal Resilience, and Climate-Smart Ocean Economies, but the issues still demand attention. **These natural ecosystems deliver livelihoods and food security for more than 70 percent of the region’s population. The urgency to step up financing and action—specifically for dedicated investment plans (such as the climate-smart investment plans for CSA, the Forest Investment Program [FIP]) —must not be deferred.** Equally, the call for *anticipatory planning in strategic multicountry river basins coupled with programmatic interventions must be heeded to prevent mis- or maladaptation. Opportunities for carbon sequestration through afforestation, reforestation, and land-use options in support of community resilience and ecosystems services are even more attractive and compelling as the global community pursues multiple strategies to reduce emissions. Resource limitations that require clear setting of priorities among competing investments challenge the potential to realize transformation at scale.*

**Powering resilience.** While the support to renewables (Solar Power and Hydropower, and to a lesser extent Geothermal) under the ACBP is on track to meet the 2020 targets, the persistent energy access gap must be addressed as a part of an overall strategy to enhance resilience of the population through overall economic development. Raising the level of ambition for renewables, including through private sector engagement, is critical. The rapidly declining costs of renewables is creating favorable conditions for shifts to them, and the Bank is working to seize such opportunities in a logic of energy system planning.

**Cities and transport.** Cities as places of future growth, spurred by demographic increases and rural-urban migration and accentuated by climate change, need to be climate-smart by pursuing transformational pathways. The ACBP experience reveals the need for cities to be moving toward large-scale, multisectoral business plans, which include low-carbon

**considerations for green building (including innovation and technology) and transport systems. Meanwhile, transportation systems have to** move from a reactive to a proactive business model and emphasize transformative, climate-resilient, and low-carbon transport in Africa. Robust analytics on resilience and decarbonization will be critical.

**Mobilizing the private sector. The private sector is crucial to ACBP success. It promotes strategic public sector interventions (e.g., investments, regulations, incentives) by harnessing the momentum around the Maximizing Finance for Development: highlighting their contributions to the climate agenda. Several ACBP components identify areas of engagement and scale-up. For example, under the Climate Smart Ocean Economies component, the Bank is looking at fishery supply chains to enable fishermen to capture large shares of value added in good harvest times as a buffer. In the Lake Victoria Basin, the Bank team is looking at green infrastructure as a protection against an adverse climate to reduce risk to the private sector and increase its incentives to invest.** Forest ecosystems provide multiple opportunities to enhance carbon sequestration through dedicated instruments.

**Resource mobilization.** The ACBP has exceeded the resource mobilization targets set out for 2020 for several ACBP components (e.g., CSA, Transport, Social Protection), and others (Solar Power, Hydropower, Climate-Resilient Landscapes, Integrated Watershed Management) are on track to deliver. Critical areas of landscape resilience, which underpin rural livelihoods, continue to have lower resources. Delivery through financial flows directly handled by the Bank—such as through IDA resources, IBRD, carbon finance, and certain trust funds (Global Environment Facility [GEF], Global Facility for Disaster Reduction and Recovery [GFDRR])—are tracked through its reporting system. In this context, co-financing against targets is significantly lower. *For the ACBP to raise its level of ambition, IDA and IBRD resources will not be sufficient. There is a need to step up resource mobilization on multiple areas of ACBP focus.*

**Investments in human capital can short-circuit the intergenerational downward spiral from climate impacts. Health and Education components ensure that climate risks are well embedded to deliver healthy and well-skilled human capital that can counter climate impacts and address the problem in an informed and planned manner across generations. Increasing investment in the adaptive capacities of societies is a key enabling condition to enhance resilience.** Investments in human capital to attain the right knowledge, training, and skills must be accompanied with sectoral investments to support healthy, safe populations resilient to climate impacts over the next few decades. The new ACBP components for Health and Education have set out clear road maps to mainstream climate action into their programs (see Chapter 13 and Chapter 14).

## Strengthening the Enabling Context

**Harnessing Innovation and Technology.** The appetite for green investments is an area of growth and opportunity that sits at the nexus of climate and development. **Green**



**Financial Systems, Financial Protection Instruments, and Green Competitiveness and Innovation**—a new component of the ACBP—lays out a clear strategy to build a strong enabling context in countries to innovate in key sectors through institutional mainstreaming for green growth and low-carbon strategies. Innovations in EO satellite data that can help to build resilience to climate change and climate variability are particularly relevant for Africa because they fill the gap of scarce and quality data. Satellite technology can provide benefits for climate monitoring and forecasting, access to systematic data sets and other applications, and integration with (scarce) existing data sources. **Harnessing Satellite Technology for Climate Resilience**—another new ACBP component—can help the region leapfrog into resilience through satellite technology applications in specific investments and dedicated capacity building.

**Knowledge platforms. Knowledge products can support climate action in investments and strategies** through technical assistance (TA), customized solutions, and capacity building. The Africa Climate-Resilient Investment Facility (AFRI-RES) and other dedicated knowledge platforms with a focus on Africa, such as the Cooperation for International Waters in Africa (CIWA), the West Africa Coastal Areas Management Program (WACA), and TerrAfrica, provide excellent support. However, there is a high demand for knowledge (and resources) to pioneer on the climate front, as expressed by some of the new ACBP components, such as Health and Finance, Competitiveness and Innovation (FCI). It will also be important to *seize the momentum created by those high-visibility global initiatives (Human Capital Index, Green Growth) to mobilize efforts and leverage resources for furthering climate knowledge and exchange.*

**Core resilience capacities. Enhanced absorptive, adaptive, and transformative capacities realized through resilience attributes (such as robustness, preparedness, and diversification attributes) are increasingly part of project design and delivery. Addressing climate risks and vulnerabilities through well-planned interventions can yield multiple pathways to resilience for communities, infrastructure, and services.** *Moving forward, the ACBP is well placed to inform, and benefit from, the focus on a resilience metric as called for under the Corporate Post-2020 plan.*

## Raising Financing and Driving Innovation in Financing

**Resource mobilization for ACBP. The initial ambition of the ACBP was to raise US\$16 billion in climate finance by 2020: US\$5.7 billion (revised to US\$8.43 billion<sup>22</sup>)** from IDA and the rest from various bilateral and multilateral sources, dedicated climate finance sources, and the private sector. The ACBP has exceeded the resource mobilization for several components (including CSA, Transport, Social Protection), while others (Solar Power, Hydropower, Climate-Resilient Landscapes, Integrated Watershed Management) are also on track to deliver. Critical areas of landscape resilience, which underpin rural livelihoods, have lower resources. The initial ACBP targets have been realized, largely through IDA (which reached close

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22. With the inclusion of the transport sector.

to US\$17 billion by June 2018). About 60 percent of ACBP financing is associated with adaptation and resilience and about 40 percent with mitigation. As before, the delivery through financial flows directly handled by the Bank (i.e., IDA resources, IBRD, and some trust funds [GEF, GFDRR, carbon finance]) has been tracked. The co-financing leveraged as associated or parallel financing has been difficult to track because they are not part of the formal World Bank tracking and reporting system. *There is a need to step up resource mobilization on the strategic areas highlighted previously. For the ACBP to raise its level of ambition, IDA and IBRD resources will continue to be critical, but will not be sufficient.*

*The ACBP is only a partial contribution to meet Africa's financial needs for climate action, but it has made meaningful inroads to step up climate action into all of the sectors. It has served as a foundational basis for scaled-up and transformational action as laid out in some of the strategic objectives.*

**Resource demands.** The Program for Infrastructure Development (PIDA) in Africa estimates its long-term implementation through 2040 at more than US\$360 billion. The overall capital cost of delivering the Priority Action Plan (PAP) from 2012 through 2020 is expected to be nearly US\$68 billion, or about US\$7.5 billion annually for the next nine years. Energy and transport projects and programs represent around 95 percent of the total cost, demonstrating the critical need for transformative investments in these sectors to support African trade, promote growth, and create jobs. Investment needs for information and communications technology (ICT) and water represent lower percentages. Work is underway to develop PIDA PAP 2.

Meanwhile, Africa's annual adaptation needs are estimated to be between US\$5 billion to US\$10 billion. Governments in Africa are availing themselves of climate financing from global funds like the Green Climate Fund (GCF), the Global Environment Facility Least Developed Countries' Fund (GEF LDCF), and Special Climate Change Fund (SCCF),<sup>23</sup> but countries continue to be challenged to access these. As of March 2018, the Africa Region (which includes North Africa) has received US\$958 million (26 percent of the total 3.7 billion) for 26 projects (figure 18.2).

NCE (2018) concludes that ambitious climate action does not need to cost much more, even as it yields considerable benefits. What is important is early and appropriate climate action. These early costs will ensure efficiency gains and delivery of services and sustained development outcomes. But if climate is ignored, as for example in roads, then rehabilitation can cost 10 times more and stress imposed by flooding 17 times more (compared to historical climate conditions). This underscores the need for an integrated approach to climate-smart development.

**Private sector mobilization and financing innovations.** Public finance alone cannot meet the financing gap. The role of the private sector remains crucial to the overall success of the ACBP. Several ACBP components identify areas of engagement and scale-up. For

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23. Bank-approved projects reflect some of the financing from the GEF and LDCF.

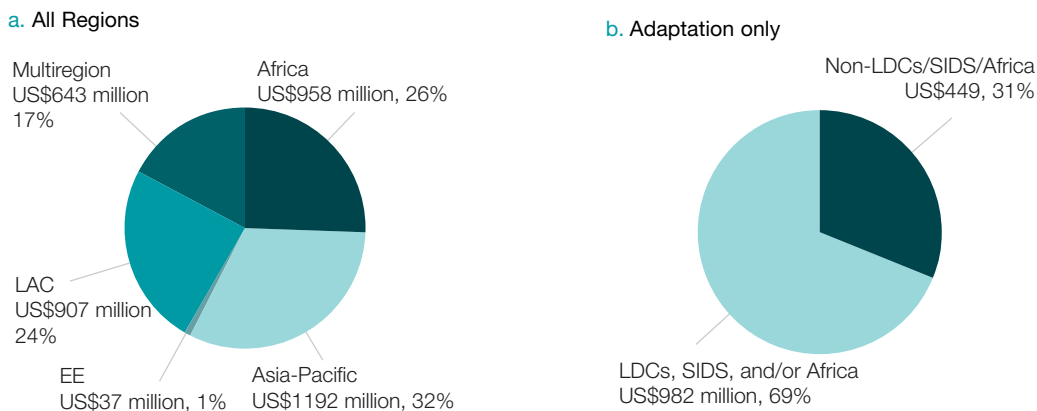
example, under the Ocean Economies component, the Bank is looking at fishery supply chains to enable fishermen to capture large shares of value added in good harvest times as a buffer. In the Lake Victoria Basin, the Bank team is looking at green infrastructure as a protection against an adverse climate, which may reduce risk to the private sector and increase its incentives to invest. Forest ecosystems provide multiple opportunities to enhance carbon sequestration through dedicated instruments.

**Some financing innovations are gaining momentum to support climate resilience and broader development agendas and must be part of the mix and strategy to leverage financing.** Examples include the following.

**Maximizing Financing for Development.** The significant financing gap begs the need for continued emphasis to pioneer and innovate to unleash private-public solutions. To counter this gap, the World Bank Group is seeking to Maximize Financing for Development (MFD), an approach that seeks to leverage the private sector while optimizing the use of scarce public resources. The MFD applied to large-scale investments holds promise for learning and replication in Africa. The Nachtigal hydropower project in Cameroon demonstrates the principles: it is not only crowding in private capital and reducing public debt but also lowering the overall costs of service for electricity and enabling the country to meet its ambitious targets by meeting its energy demand through renewable sources.

**Sovereign instruments.** These are gaining prominence to support climate resilience and broader development agendas. Seychelles has launched the world’s first sovereign blue bond—another pioneering financial instrument that combines public and private financing to support the transition to sustainable fisheries and safeguarding the oceans to develop a blue economy. With sovereign risk financing, the Kenya Catastrophe-Deferred Drawdown Option (Cat-DDO) provides rapid access to funds in the event of disaster and supports key reforms to strengthen the country’s ability to manage disaster and climate risks proactively.

**Figure 18.2:** Total GCF Funding Amount by Region, March 2018



Source: GCF 2018.

**Crowd funding.** It is an example of nonconventional financing. A smaller European technology firm working in East Africa, challenged with raising capital and overcoming other constraints, used crowd funding to upscale solar and help rural poor households get energy. According to the World Bank, globally, crowd funding provided US\$2.1 billion in investment in 2015, and investments in low-income countries (LICs) are predicted to exceed US\$96 billion a year within a decade.

**Remittances.** Despite being the most expensive place to send money to, Sub-Saharan Africa saw a 11.4 percent growth in remittances to US\$38 billion in 2017, supported by improving economic growth in advanced economies and higher oil prices benefiting regional economies. Nigeria (with US\$21.9 billion) was the largest remittance recipient, followed by Senegal (US\$2.2 billion), and Ghana (US\$2.2 billion). The direct benefits of remittances, which often spike at the time of environmental- and climate-induced events (e.g., floods, droughts), coupled with the trickle down and multiplier impact of these remittances, have been found increasingly to yield benefits at the local level. However, they cannot be seen as a substitute for core development, especially since the poorest households could be entrapped and without the means for mobility to harness remittances.

## Forward Look—Bringing It Together

This Third Progress Report indicates a necessity to step up climate action with greater vigor and focus through the proposed four lines of action as part of the Forward Look. Elaborating a next generation climate business plan and mobilizing concrete resources will be the next critical step.

A Gambian weaver shows off his colorful textiles. Access to markets are key for West African artisans. (Shutterstock)





# Appendix A

## *Methodology for Assessment of SCDs and CPFs for Integration of Climate Risks and Linkages with NDCs*

**Table A.1:** Qualitative Assessment of SCDs and CPFs for Integration of Climate Risks and Linkages with NDCs

<ul style="list-style-type: none"><li>• Incorporation of climate change risks and vulnerabilities</li><li>• Does the SCD reflect climate change as a risk to sustainability?<ul style="list-style-type: none"><li>» Does the SCD clearly identify the climate change risks?</li></ul></li><li>• Does the SCD reflect climate vulnerabilities? If so, are they reflected in a silo (i.e., as a separate, stand-alone discussion) or given strategic recognition across sectors?<ul style="list-style-type: none"><li>» Does the SCD identify the sectoral impact of these climate vulnerabilities?</li></ul></li><li>• Does the SCD reflect climate change impacts on the twin goals of poverty reduction and inclusive growth and prosperity?</li><li>• Does the SCD reflect strategic linkages to climate change as an issue in specific sectors?</li><li>• Does the SCD highlight opportunities for tackling climate change?</li><li>• Does the SCD identify existing climate-smart policies and make recommendations for additional policies?</li><li>• Does the SCD identify knowledge gaps related to climate change?</li></ul>
<p><b>Referencing of NDCs</b></p> <ul style="list-style-type: none"><li>• Does the SCD make explicit reference to NDCs?</li><li>• Does the SCD refer to the NDCs in the analysis on government strategies and policies?</li><li>• Does the SCD incorporate NDCs in sectoral analysis?</li><li>• Does the SCD recognize NDC-related knowledge gaps?</li></ul>
<p><b>Each CPF was assessed against the following criteria.</b></p> <p>Incorporation of climate change risks and vulnerabilities</p> <ul style="list-style-type: none"><li>• Does the CPF, drawing from the SCD, appropriately reflect climate change risks, vulnerabilities, and opportunities?</li><li>• Does the CPF reflect strategic linkages to climate change as an issue in specific sectors?</li><li>• Does the CPF have a pillar on climate change, adaptation, resilience, and/or mitigation?<ul style="list-style-type: none"><li>» If not, is climate change (adaptation/resilience and/or mitigation) reflected adequately within the pillars identified?</li></ul></li><li>• Is climate change addressed or reflected in pipeline projects and ASAs?</li><li>• Does the CPF address climate change-related knowledge gaps identified in the SCD, particularly in the form of pipeline ASAs?</li><li>• Does the CPF appropriately track climate action in the results framework?</li></ul>
<p><b>Reflection of NDCs</b></p> <ul style="list-style-type: none"><li>• Does the CPF make explicit reference to the NDCs?</li><li>• Does the CPF link/include government strategies and policies to the NDCs?</li><li>• Does the CPF make strategic cross-sectoral linkages to NDCs?</li><li>• Are the NDCs reflected in the results framework, in the objective/intervention logic/indicators?</li><li>• Does the CPF explicitly indicate an intention to support implementation of NDC and, if so, are there any specific ASAs or investments mentioned?</li></ul>
<p><b>Co-benefits</b></p> <ul style="list-style-type: none"><li>• Does the CPF make reference to the WBG goal on co-benefits?</li><li>• Does the CPF identify areas to maximize climate co-benefits?</li><li>• Does the CPF indicate increasing ambition to maximize climate co-benefits?</li><li>• Does the CPF include a complete co-benefits assessment of active, past, and indicative broad pipeline projects?</li></ul>



# Appendix B

## ***Methodology for Resilience Analysis for the ACBP: Third Progress Report***

### Background

Resilience is increasingly recognized for its importance in achieving development goals, and there are ever more calls to grow our investments in resilience-building activities. Practitioners have long discussed how to integrate resilience into projects and operations, ways in which resilience-building projects can be designed, and how resilience can be practically measured and evaluated. The World Bank Board endorsed adaptation and resilience as the most important priority for action during the Climate Change Action Plan Board update in June 2018.

Between 2015 and 2018, the Results Monitoring and Evaluation for Resilience-Building Operations Project (ReM&EP) has been working to develop a systematic approach to resilience M&E for World Bank projects and operations. This project has studied, solicited input on, and internalized best practices in resilience M&E, and has produced various publications and resource materials to support operational teams at the World Bank (and externally) to integrate, monitor, and evaluate resilience-building in projects and programs. These resources are housed at the Resilience M&E knowledge portal.<sup>24</sup>

The project has influenced the Africa Climate Business Plan's (ACBP's) Second Progress Review (World Bank 2017a), in which it supported shaping the story of how projects within ACBP's umbrella are achieving resilience. This analysis will be deepened through the use of resilience attributes in addition to resilience capacities.

### Objective

The purpose is to monitor resilience outcomes and evaluate pathways the ACBP portfolio has taken to build resilience to climate and disaster risks.

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24 See the FURL website at <http://documents.worldbank.org/curated/en/400851506100481060/World-Bank-resilience-M-E-ReM-E-good-practice-case-studies>

## Selection and Methodology

Based on a review of ACBP project documents, operations are identified based on the following criteria:<sup>25</sup>

- They are from FY16–18.
- They have board-approved project appraisal documents (PADs) or project papers. This is done so that comprehensive project details can be accurately analyzed at the component level.

They provide 90 percent of the climate change adaptation co-benefits within the ACBP component they are tagged against (IDB et al. 2018, annexes B and C).<sup>26</sup> This is done because the primary goal for this review is to glean resilience pathways for climate and disaster risks. Selecting projects delivering the top 90 percent of climate change adaptation co-benefits for each ACBP component allows capturing results across a sample of the entire ACBP pipeline and portfolio.

Fifty-seven projects met the criteria and had project documents available, comprising 27 percent of the total ACBP projects under FY16-18, and 58 percent of the total ACBP projects in FY16-18 that have climate change adaptation (CCA) co-benefits. The distribution of projects selected is summarized in the table below.

**Table B.1:** Distribution of Projects across ACBP Components for which Resilience Attributes and Pathway Analysis Were Applied

ACBP component	Projects in FY16–18	Projects that contribute to at least 90% CCA co-benefits	Projects assessed
Climate-Smart Agriculture (CSA)	79	26	28
Climate-Resilient Landscapes (Drylands)	20	3	6
Climate-Resilient Landscapes (Forests)	17	2	4
Water	9	6	5
Niger River Basin	2	2	2
Lake Chad	0	0	0
Zambezi Basin	0	0	0
Lake Victoria Basin	1	1	1
Climate-Smart Ocean Economies	13	2	2
Climate-Smart Cities	15	5	7
Coastal Resilience (West Africa)	4	2	2
Climate-Smart Transport	31	11	11
Solar	23	1	2
Hydropower	10	1	1

25 Taken from the ACBP 2018 project database. Please contact Kanta Kumari Rigaud at [kkumari@worldbank.org](mailto:kkumari@worldbank.org) to access the database.

26 The climate co-benefits assessment at the World Bank follows the Joint Methodology for Tracking Climate Finance that the World Bank and other multilateral development banks use to track and report on climate finance. See IDB et al. (2018), annexes B and C, for the methodology.

**Table B.1:** Distribution of Projects across ACBP Components for which Resilience Attributes and Pathway Analysis Were Applied (*continued*)

ACBP component	Projects in FY16–18	Projects that contribute to at least 90% CCA co-benefits	Projects assessed
Geothermal	1	0	0
Addressing Drivers and Impacts of Migration	6	1	1
Social Protection	22	2	5
Africa Hydromet Program	4	1	1
AFRI-RES Facility	1	1	0
Climate-Smart Health	12	2	3
Climate-Smart Education	18	3	3
Green Financial Systems, Financial Protection Instruments, and Green Competitiveness and Innovation	0	0	0
Macroeconomics, Trade, and Investment	0	0	0

Note: For each ACBP component those projects were selected that contributed to delivering at least 90 percent CCA co-benefits under that ACBP component. The numbers here reflect more than the total of 57 projects assessed because projects are often tagged as more than one component.

## Building the Database

The components of these projects, as well as other essential project information, have been consolidated in a master database, which contains 208 Board-approved projects from FY16–18. In the cases of Program for Results (P for Rs), their Disbursement Linked Indicators (DLIs) were analyzed and included in the master database instead of components, since they provided further information. The projects are divided into 23 ACBP components. Of these, six components—Africa Climate-Resilient Investment Facility (AFRI-RES); Chad and Zambezi (part of Integrated Watershed Management); Geothermal; Macroeconomics, Trade, and Investment; and Finance, Competitiveness, and Innovation—did not meet the criteria of this methodology for FY16–18 as of September 12, 2018. Geothermal did not have any projects with CCA co-benefits while the remaining five did not have any projects under FY16–18. Furthermore, three ACBP components (Africa Hydromet Program, Water, and Climate-Smart Transport) fell slightly short of the 90 percent CCA co-benefits criteria. This is because some projects were not Board-approved and had to be dropped from the analysis.

Information on climate change co-benefits is extracted from Climate Co-Benefits Dashboard.<sup>27</sup> ACBP operations providing CCA co-benefits are tagged in the database and sorted by value (US\$). Of the 208 projects with a total commitment of US\$20.6 billion and total climate co-benefits of US\$6,574 million, 140 projects positively contribute to climate change co-benefits and 98 contribute to CCA co-benefits. The remaining projects either did not have any climate change co-benefits or they were not assessed for climate change co-benefits due to unavailability of information.

27 To access the dashboard, see: [https://tab.worldbank.org/t/WBG/views/Climate\\_Finance\\_Dashboard\\_Corporate/Corporate?embed=y&showShareOptions=true&display\\_count=no&showVizHome=no&toolbar=top](https://tab.worldbank.org/t/WBG/views/Climate_Finance_Dashboard_Corporate/Corporate?embed=y&showShareOptions=true&display_count=no&showVizHome=no&toolbar=top). Version as of this report updated on August 31, 2018.

## Approach

To capture an illustrative set of resilience-building pathways being implemented or planned within the ACBP, the projects' components are studied for their resilience-building attributes and associated capacities they contribute to using the ReM&E overarching resilience results framework and the Resilience Assessment Benchmarking and Impact Toolkit (RABIT).<sup>28</sup> One or more resilience attributes can contribute to enhancement of resilience capacities in the context of absorptive, adaptive, and transformative actions. The resilience pathway analysis articulates how project activities are enhancing resilience attributes, which are in turn building resilience capacities.

Project components are studied and their activities screened for relevance to climate and disaster resilience building. Components are considered “resilience relevant” if they are related to one or more of the following attributes, and they are simultaneously tagged to contributing toward one or more of the following core resilience capacities in chapter 1, table 1.15.

Many projects have multiple pathways toward resilience, because components contribute toward building different types of resilience attributes or core capacities. Additionally, components can build more than one resilience attribute or core resilience capacity, so the relationships are not always linear.

Components are further categorized as:

- **Y:** Yes, the component is directly relevant to resilience. These components are directly included in the analysis.
- **Y\*:** Yes, the component could be relevant to resilience if it measures dimensions specific to climate and disaster risks. These components are included in the analysis.
- **N:** Not related to resilience. These components are dropped from the analysis.

Many of these components' categorizations, generalizations, and simplifications are subjective and are not always reflective of the specific project context in which the components are applied. As such, the analysis should be used only for illustrative and instructive purposes to show the breadth and variety of components being applied to reflect results related to climate and disaster resilience.

## Next Steps

AFRI-RES trust funds are supporting 16 projects to ensure enhanced consideration of climate resilience in their design. Task teams have self-assessed the baseline and anticipated targets against the aforementioned resilience attributes. This analytical work

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28 Through consultations with the infrastructure and sustainable development vice presidencies, an overarching results framework for resilience was produced under the ReM&E project. Details on this framework can be found in the ReM&E Operational Guidance Note. For RABIT framework, see: <http://www.niccd.org/resilience/>

and methodology will be useful to assess the output of this exercise to encourage proactive upstream engagement toward resilience. The work will be organized around these three areas.

- Assessment of “selected” PADs for the resilience attributes or capacities.
- Assessment of “selected best-case examples” for ACBP-3 report against resilience attributes or capacities.
- Collation of information from 16 AFRI-RES supported projects against resilience attributes (baseline and expected targets).

# Appendix C

## ***Methodology for Resilience Analysis for Assessment of AFR SCDs and CPFs***

The World Bank Group seeks to mainstream climate change into country strategies across the Bank. Through Systematic Country Diagnostics (SCDs) and Country Partnership Framework (CPF) instruments, the country engagement process becomes the entry point to mainstream climate change into upstream Bank operations. International Development Association (IDA)17 and IDA18 include a special theme on climate change with mandates to include climate risks as part of the SCD analysis and in the CPF. IDA18 includes a policy commitment to reference a country's Nationally Determined Contribution (NDC) to the 2015 Paris Agreement in the SCD and the CPF. The aim of this exercise is to include in the Africa Climate Business Plan (ACBP) an assessment of the incorporation of climate change aspects, including the NDCs, in SCDs and CPFs for the Africa Region. This assessment will illustrate how climate change and NDC considerations are reflected upstream and in the pipeline. This is a new analysis—it has not been conducted in previous editions of the ACBP. It is part of an effort to go beyond assessing project documents on the mere absence or presence of references to NDCs toward a more strategic and interlinked integration of climate change risks and opportunities and NDCs.

### **Methodology**

This assessment will focus on completed (presented to Board) SCDs and CPFs in FY18, based on Board presentation dates. The universe for assessment will therefore include 10 SCDs<sup>29</sup> and three CPFs<sup>30</sup> from FY18. The respective SCDs for the three CPF countries will also be reviewed briefly to understand the nature and extent of climate change issues included in the diagnosis, and if this in turn appropriately informed the climate change strategies in the CPF. See appendix A, table A.1, for assessment and ratings criteria of the FY18 SCDs.

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29 FY18 SCDs: Benin, Burundi, Cabo Verde, Democratic Republic of Congo, Guinea, Liberia, Niger, Sierra Leone, South Africa, Zambia

30 FY18 CPFs: Guinea, Niger, Tanzania



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