



USAID
FROM THE AMERICAN PEOPLE



GLOBAL CLIMATE CHANGE INITIATIVE: PROGRAM PROFILES

December 2014

“This challenge demands our ambition. Our children deserve such ambition. And if we act now, if we can look beyond the swarm of current events and some of the economic challenges and political challenges involved, if we place the air that our children will breathe and the food that they will eat and the hopes and dreams of all posterity above our own short-term interests, we may not be too late for them.”

— U.S. President Barack Obama
September 2014

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INTRODUCTION

At a time when economic growth has lifted millions of people from poverty, climate change impacts are posing a new challenge to global development. Extreme weather events such as droughts, floods and storms already constitute three-quarters of global natural disasters, and these events are becoming less predictable, more intense and possibly more frequent as global temperatures rise. More gradual changes, such as shifting rainfall patterns, rising temperatures and more acidic oceans are also taking a toll by putting food and water supplies at risk. In many vulnerable areas, these risks could exacerbate existing challenges and worsen poverty and insecurity.

But, while climate change presents risks, it also offers opportunities. A global clean energy market is emerging, making solar, wind and other technologies available at increasingly competitive costs. Many developing countries are looking for ways to leapfrog fossil fuels by tapping cleaner, more efficient energy technologies. For some countries, investing in clean energy can deliver multiple benefits, including economic growth, greater energy access and better health for citizens.

Given the opportunities and risks, incorporating climate change knowledge and practice into development programs today is simply better development. Moreover, incorporating climate change into development programs does not need to be complicated. In many cases, simply accessing climate information or evaluating climate scenarios is enough on its own to produce better decisions that make agriculture, infrastructure and other development sectors more climate-resilient. However, even the capacity to access and apply climate information remains out of reach for too many countries and communities. USAID is working to ensure all countries and communities can access and use climate and weather information to look beyond “business as usual” scenarios and make better decisions for today and tomorrow.

What we do

Every country is unique in its people and geography, and every country faces unique climate opportunities and risks. At USAID, climate-smart development is country-led, which means U.S. partner countries define their own goals and build the critical capacities they need to prepare for the most likely climate scenarios. Countries need the ability to access and use climate information, assess and prioritize among climate-smart actions and pursue policies that will trigger investments in clean energy and sustainable land management. They also need the ability to safeguard vulnerable sectors, such as agriculture and tourism, and to equip people and communities with strategies and tools to build resilience to climate change.

As the primary agent of U.S. development aid, USAID provides climate assistance that reaches more than 50 partner countries in Africa, Asia, Eastern Europe and Latin America. These partners include major-emitting developing countries, key tropical forest nations and countries most vulnerable to climate change, including many island and African states.

USAID and the U.S. State Department have forged special high-level partnerships with 24 countries pursuing low-carbon development under the flagship Enhancing Capacity for Low Emission Development Strategies (EC-LEDS) program. Partner countries include Indonesia, the Philippines, Colombia, Mexico, Georgia, Ukraine, Kenya, South Africa and more than a dozen others, which together account for 10 percent of global greenhouse gas emissions.

USAID also works to ensure all relevant programs across its development portfolio are climate-smart and climate-resilient. Incorporating climate-smart information and practice is critical to ensuring U.S. taxpayer-funded investments in food security, disaster risk reduction and infrastructure are designed to withstand the climate

conditions of today and tomorrow. This supports Executive Order 13677, Climate-Resilient International Development.¹

How we do it

Climate-smart development at USAID spans three main pillars of action, which align with the President's Climate Action Plan, the U.S. Global Climate Change Initiative (GCCII) and USAID's Climate Change and Development Strategy. The three pillars are: adaptation policies and actions that increase climate resilience for people, places and livelihoods; clean energy policies and actions that mobilize clean energy investment and reduce climate pollution through efficiency; and sustainable landscapes

policies and actions that lead to improved land-use management and reduced climate pollution from land use.

USAID partners with local governments, businesses and civil society organizations to mobilize people and resources. Using this approach, USAID mobilized well over \$1 billion in private and public sector resources for climate change work over the fiscal years 2010 through 2013. In fiscal year 2013 alone,² USAID climate change support reached an estimated 600,000 stakeholders – including agricultural extension workers, disaster preparedness experts, scientists, academics and meteorologists – with better climate information, tools and practices to support informed, climate-smart decisions.



Woman uses a foot-operated pump to irrigate crops in Kenya

¹ [Executive Order 13677 – Climate-Resilient International Development](#) was published in September 2014.

² Fiscal year 2013 is the latest year for which comprehensive results data are available.

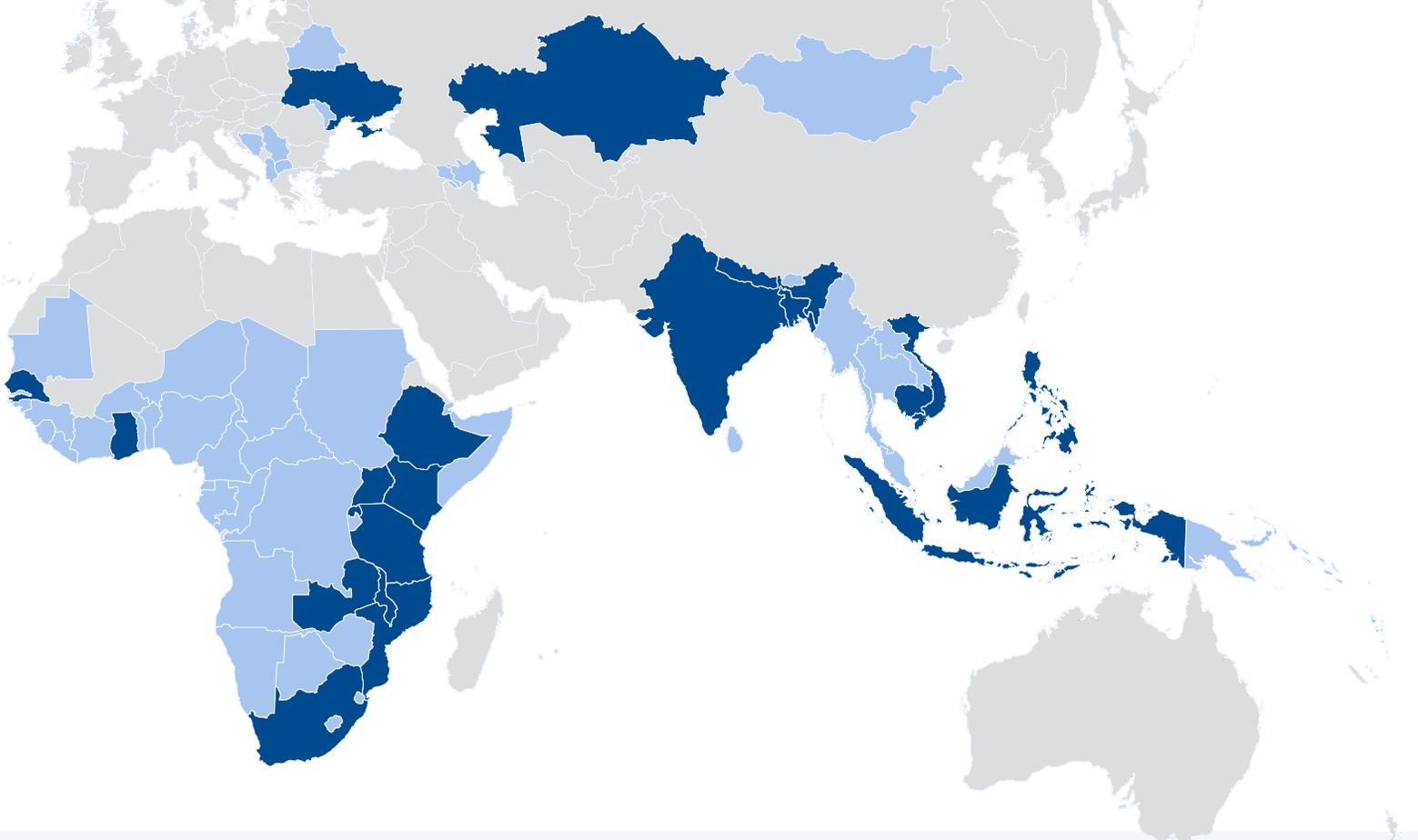
At its core, climate-smart development is about empowering people to access and use what we know about science, policy and technology to assess climate change risks, reduce vulnerability and transition to clean, low-carbon growth. In some regions, this means accessing satellite data and geospatial information to monitor floods, fires and forests; in others it means using climate forecasts to evaluate risks and create action plans; in still others, it means establishing greenhouse gas inventories and enacting new policies to mobilize clean energy investment, improve land use and reduce carbon pollution. USAID climate funds aim to ensure countries and communities are empowered to address climate change risks and opportunities.

USAID support for climate-smart development reaches more than 50 countries around the world, with approximately \$350 million per year. About two-thirds of this support is delivered in-country by USAID missions under USAID's country-led approach to development. One-third is delivered through regional and global programs that provide policy, scientific and technical expertise, as well as technology tools and solutions.

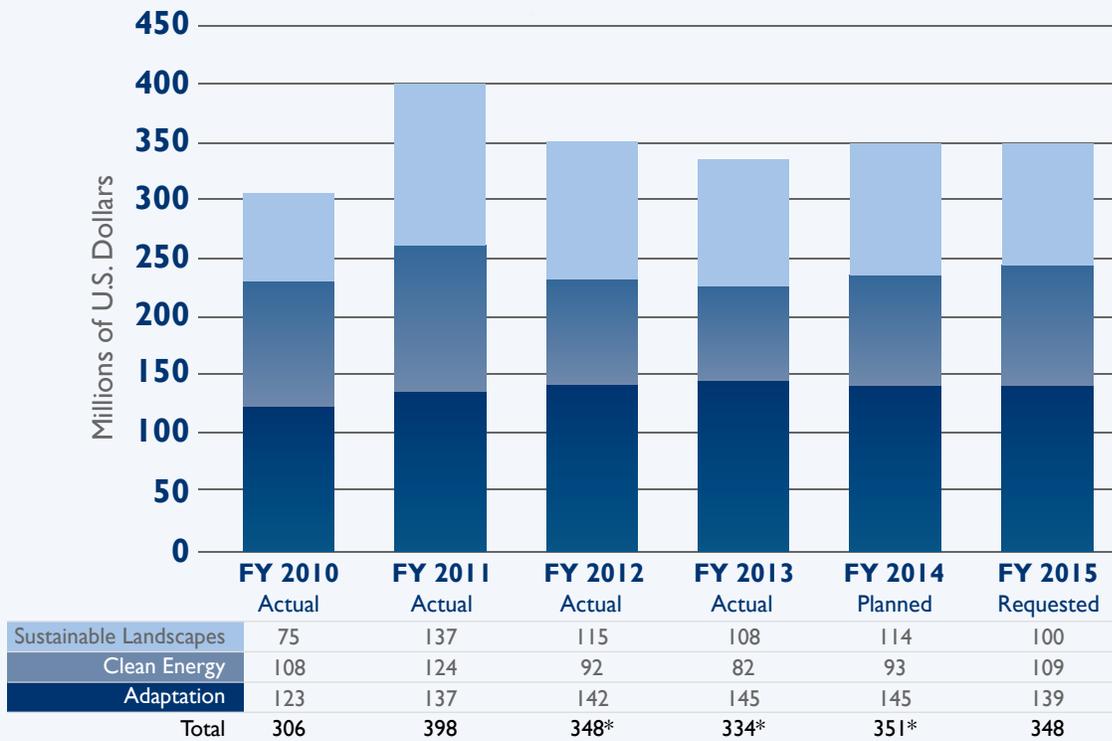
Increasingly, support for climate-smart activities is being integrated across USAID development programs, from food and water security to disaster preparedness to energy development. This approach works to ensure that USAID development programs are not undermined by climate change and support the global transition to low-carbon growth.

This report features a cross-section, not a comprehensive catalogue, of USAID climate activities across the countries depicted.





USAID GLOBAL CLIMATE CHANGE INITIATIVE (GCCCI) BUDGET BY FUNDING PILLAR



*Totals may differ from sum of pillars due to rounding

USAID support for climate-related activities across country, regional and global programs totaled approximately \$350 million per fiscal year from 2010 through 2014. In addition to this direct support for climate-related activities, USAID funding for food and water security, resilience, energy development and other development programs provided significant indirect climate benefits, or climate co-benefits.



Filipinos track fish populations to ensure effective management of local marine areas

In 2013, USAID climate change support reached an estimated 600,000 stakeholders – including agricultural extension workers, disaster preparedness experts, scientists, academics and meteorologists – with better climate information, tools and practices to support informed, climate-smart decisions.

ADAPTATION PROGRAMS: BUILDING GLOBAL CLIMATE RESILIENCE

Natural disasters have cost the world on average 106,000 lives and \$157 billion per year over the last decade.³ More than three-quarters of global disasters are weather-related events, such as droughts, floods, storms and heat waves, which are expected to become less predictable, more intense and possibly more frequent with climate change. At the same time, gradual yet persistent changes in temperatures, rainfall patterns, ocean acidity and sea-level rise are creating new risks for crops, water supplies, health and food security.

USAID climate adaptation funds are helping some of the world's most vulnerable people and countries anticipate and prepare for climate change risks and increase climate resilience. These include highly vulnerable countries and regions, such as least-developed African states, small island states and glacier-dependent areas.

Countries around the world are already facing climate change impacts. This means current and future climate patterns are critical to development decisions being made today. By combining today's sophisticated climate forecasting abilities with our knowledge of human and economic development, USAID is empowering countries and communities to plan smarter, prepare and adapt. Adaptation can be as simple as evaluating climate scenarios before siting a new bridge or seawall, or as complex as developing new crop varieties that can thrive in warmer or drier conditions.

To ensure today's development efforts factor in climate information and risks, USAID provides direct adaptation funding that reaches more than 30 countries, including half a dozen regional programs. These funds are helping USAID stakeholders improve policies at all levels and access, tailor and apply weather and climate information to reach better decisions, reduce vulnerability and increase resilience to climate changes.

³ See the Research Center on the Epidemiology of Disasters' [Annual Disaster Statistical Review 2013](#)

SERVIR Global: Tapping Satellite Data for Climate Resilience

Satellite technologies have vastly increased our ability to track and prepare for dangerous weather-related events, including floods, droughts, fires and storms. Climate and weather forecasting models add still more value, allowing us to predict changing conditions such as warming temperatures or sea-level rise, and take actions to increase resilience. Much satellite and climate data is freely available online, but too few people around the world have the specialized training and skills to access and use this powerful resource.

USAID and NASA founded the SERVIR⁴ Global initiative to provide access to and training in Earth observation data, geospatial information and predictive models for countries and communities around the world. By partnering with leading regional organizations, SERVIR is helping people monitor risks and make life-saving decisions in 38 countries through hubs in East Africa, Southern Africa, the Hindu-Kush Himalaya region, Central America and the Mekong region in Southeast Asia. A new SERVIR hub for West Africa is planned.

SERVIR hubs offer scientists, technicians and decision-makers training and hands-on experience to access and use remote-sensing technologies. SERVIR hubs also enable local and global scientists to collaborate, leading to innovative new services and decision-support tools.

In Bangladesh, where millions of farmers and families depend on seasonal flooding for rice planting, severe monsoon floods destroy lives, homes, crops and livestock every year. A SERVIR team of experts developed an early warning tool using satellite radar data to track river levels more than 600 miles upstream, more than doubling advance warning time to eight days, giving farmers and families precious time to prepare and protect crops and livestock. In this case, satellite data is a powerful alternative to costly local data collection and a lack of data sharing between countries, which can hamper early warning efforts.



Satellite image shows drought patterns in Kenya

By focusing on training and local capacity building, SERVIR is contributing to lasting solutions. Today, experts at the Bangladesh government's Flood Forecasting and Warning Center are independently operating the model, making daily flood forecasts available eight days in advance, providing millions of Bangladeshis with life-saving information at a time when changing rainfall patterns are making flood cycles more destructive and erratic.

“Through partnerships like SERVIR, scientists will be able to use cutting-edge technologies to monitor complex challenges as they happen – helping to save lives and build more resilient communities.”

— USAID Administrator Dr. Rajiv Shah
February 2014

⁴ SERVIR, meaning “to serve” in Spanish, was launched originally as a regional program in Central America. Under GCCI, SERVIR became a global program: [SERVIR Global](#).

Ethiopia: Integrating Climate Resilience into Food Security

Few places have experienced the extremes of drought and famine that East Africa has in recent decades. Climate change is one of many factors compounding this vulnerable region's risk of hunger, migration and conflict. In some parts of Ethiopia's arid lowlands, rainfall has decreased as much as 20 percent over the last 40 years. Climate projections suggest rainfall patterns will continue changing, likely leading to even drier conditions in some areas – and more flooding when it does rain.

Some 80 percent of Ethiopia's 90 million people earn their livelihoods from agriculture, and most depend heavily on natural rainfall and weather patterns. As a result, exposure to extreme weather events is a common stress to which Ethiopians are particularly vulnerable. Indeed, half of all Ethiopian agricultural workers can be classified as poor farmers or pastoralists, who work small, degraded plots in the highlands or raise livestock in the arid lowlands. Poverty and malnutrition remain widespread.

USAID is supporting Ethiopia by integrating climate change knowledge, data and good practices into food security and other programs, ensuring major programs are resilient to climate changes and current and future weather extremes. One powerful example of this is the PRIME initiative,⁵ which is improving food security among Ethiopian herders and farmers.

Activities supporting climate information, climate awareness and vulnerability assessments are directly integrated into the PRIME program, as are activities to improve early warning information. PRIME is bringing scientific and local knowledge together to produce seasonal forecasts tailored to local needs, allowing rainfall-dependent farmers to make better planting decisions. PRIME also includes multiple risk mitigation and management strategies, such as improved water storage, better animal nutrition and access to financial services like insurance, which are used by farmers around the world.



Woman tends crops in drought-prone region of Ethiopia

⁵ [Pastoralist Areas Resilience Improvement and Market Expansion \(PRIME\)](#) was launched in December 2012.

Asia's Water Tower: Assessing Risks to Water Supplies for Two Billion People

The five mountain ranges and watersheds of High Asia stretch across 1 million square miles, straddling 10 countries and pouring fresh water into major river basins including the Ganges, Brahmaputra, Indus, Amu Darya and Syr Darya, Yangtze, Mekong, Salween and Irrawaddy. This massive hydrological system has been dubbed "Asia's water tower" because roughly a third of the world's population depends to some extent on its fresh waters.

Glaciers and snowmelt are critical to water cycles in High Asia. But today rising global temperatures are gradually shifting the timing and volumes of glacier and snow melt, posing new risks for the 2 billion people living downstream. Current knowledge of river flows and snow and glacier melt in Asia's water tower is limited, making it impossible to forecast how rising temperatures will affect this system.

An accurate mapping of existing water resources is critical to forecasting the risks to regional populations. USAID and scientists from the University of Colorado's Snow and Ice Data Research Center are collaborating with local scientists and institutions to map water resources and train local observers to collect water and precipitation samples. Ten government agencies and universities from eight countries in High Asia are part of this collaborative data-gathering network. The aim is to establish long-term monitoring of glacier dynamics and river flows for agricultural, industrial and domestic users throughout Central and South Asia.

The team is using satellite data from leading global space agencies, including NASA and others, to develop time-series maps of seasonal snowfall and recent glacier melt, to be compared with river discharge data from across the study area. This data is critical to understanding what will happen to rivers like the Indus and the Brahmaputra over the next 20 years.

In some parts of High Asia, melting mountain glaciers are creating fast-growing lakes that are prone to bursting their naturally formed earthen walls, washing away crops, roads and communities downstream. Imja Lake, one

of the largest and fastest-growing glacial lakes in Nepal today, lies just upstream from the tourist route leading to Mount Everest Base Camp. If Imja Lake were to burst its walls, the resulting flood could wash away lives and homes, cause millions of dollars in damages and cut off access to a tourist destination that generates up to 4 percent of Nepal's economic activity.

With USAID support, the High Mountain Adaptation Partnership has emerged as an international community of practice on glacier melt and related risks. This partnership is working with communities living downstream from glacial lakes to gather information, conduct scientific analyses and develop engineering solutions and risk management strategies. Through exchanges, these solutions are being shared by experts in Nepal and Peru, countries at the forefront of managing glacial lake hazards.



Lake Imja, one of Nepal's largest, fastest-growing glacial lakes

Central Asia's Breadbasket: Preventing Crop Failure in Kazakhstan

Kazakhstan is a critical wheat supplier to neighboring Central Asian Republics and Afghanistan. Wheat production is known to suffer from periodic droughts in this arid steppe region, and changes in wheat availability and prices can have major impacts on food security region-wide. Wheat harvests during drought years in Kazakhstan can be six times smaller than in normal years.

Climate change is expected to increase extreme temperature events and the frequency and intensity of droughts in the wheat-growing regions. Despite these known threats, there is little local awareness of climate change, and the concept of adaptation is relatively new.

To help ensure a stable, affordable supply of wheat in this region, USAID is partnering with UNDP and local Central Asian organizations to catalyze adaptation in Kazakhstan's wheat sector. As a critical first step, USAID is supporting the development of improved climate information services to enable farmers, wheat processors and policymakers to take proactive measures.

USAID's program focuses on working with wheat farmers, agricultural extension workers and local meteorological services to increase their understanding of expected climate impacts on wheat and to develop their capacity to provide timely climate and weather information to farmers. USAID is also working with the government, private sector and research communities to identify and share adaptive measures so the wheat sector as a whole is better prepared for climate changes.

Equally important, USAID is working with partners inside and outside the region to bring Kazakhstan together with other Central Asian Republics and Afghanistan to discuss national and regional strategies to buffer against the risk of changes in wheat production and food security. USAID's work is increasing resilience in Kazakhstan's wheat sector, but other countries in Central Asia must also be prepared to respond to food security risks outside their borders.



Woman displays bread, a centerpiece of the Central Asian diet

Small Islands: Preparing for Change in the Most Vulnerable States

In Jamaica – an island smaller than Connecticut – half of economic assets and 70 percent of people are located in coastal areas. This means much of Jamaica's economy and its 3 million people are vulnerable to natural disasters, such as hurricanes and storm surges, and also to slower-moving events, such as sea-level rise and ocean acidification.

Jamaican farmers, fishers and hotel operators are already feeling the impacts of higher temperatures, more intense storms and storm surges, longer dry spells and increased rainfall variability. A drought that started in May 2014 has caused millions of dollars in crop losses.

From 2001 to 2012, Jamaica suffered more than five major hurricanes, plus multiple tropical storms, floods and droughts. Together these events caused more than \$1 billion in damages as well as loss of lives, homes and livelihoods for thousands of individual Jamaicans.

Small islands like Jamaica may have to make significant changes to adapt as global temperatures rise. With support from USAID, Jamaica's government has committed to a comprehensive approach to prepare its people and economy for this growing risk. To start, Jamaica's Water, Land, Environment and Climate Change Ministry is spearheading an effort to ensure that all ministries and economic sectors have access to timely and accurate information about climate change scenarios and impacts and can apply that information in meaningful ways.

Key economic sectors are already translating this information into action. Jamaica's meteorological service is modernizing the way it manages information by standardizing and streamlining its data and information systems and ensuring agricultural extension workers can develop seasonal outlooks tailored to farmers' questions and needs. This effort to improve information

management is already proving crucial, helping the 20 percent of Jamaicans who work as farmers and fishers reach better decisions about when to plant, fish or harvest. Jamaican farmers may have to make even tougher decisions in the future, for instance, switching crops or relocating crops to less vulnerable areas.

Just to the east of Jamaica, in the Dominican Republic, a population of 10 million faces similar risks. Here, USAID is working directly with smallholders to

introduce improved climate and weather information services and climate-smart risk management practices.

For instance, USAID is helping small banana growers set up weather stations to measure temperature, humidity, water, wind, ultraviolet radiation and other factors critical to production. In 2013, water shortages caused a 30 percent drop in production at one local banana growers' association. Small producers who couldn't afford electric pumps to irrigate their fields were hardest hit. Tailored information products combined with increased adoption of on-farm risk management practices will help Dominican farmers better prepare for future stresses.



Woman surrounded by hurricane damage in Jamaica

The Philippines: Building Climate Resilience

In an average year, nearly 20 typhoons hit the Philippines, a nation of 7,000 islands. Scientists expect these storms to become less predictable, more intense and possibly more frequent as global temperatures rise.

In late 2013, Typhoon Haiyan was the most powerful storm ever to make landfall, slamming the Philippines with 195 mile-per-hour winds, causing 6,300 deaths, destroying 1.1 million homes, and displacing 4.1 million people. Global disaster relief reached \$800 million, with \$143 million of that from the American people.

One year later, relief has shifted to recovery, including social services and rebuilding water and sanitation systems, housing and local livelihoods. Efforts to build back better, with support from USAID and other donors, include more secure water and power infrastructure and improved early warning and emergency response systems. Many provincial and local governments are climate-proofing their infrastructure and developing sustainable land-use plans, including restoring forests to prevent erosion and landslides and planting mangroves as coastal storm barriers.

Climate-smart planning is a critical part of efforts to increase resilience in the Philippines. Preventing damage from current and future storms is harder when storm patterns are less predictable. USAID assists the Philippines in addressing this complex challenge, in part by ensuring that decision-makers and communities can access and apply timely and accurate climate and weather data.

USAID is supporting the Philippine government to add weather stations and water level sensors and to extend radar across the country. The Philippine Atmospheric Services Administration (PAGASA) is working to distribute information more effectively by providing detailed and tailored weather and hazard risk maps to local governments. USAID is also working to integrate this information into water security planning.

Project NOAH,⁶ under the Philippine Department of Science and Technology, is using supercomputers to combine satellite and ground observation data to generate real-time forecasts and flood modeling. Today, there are more than 1,000 rain gauges and weather stations across the Philippines and another 1,000 planned for 2015. NOAH is creating high-resolution images using light and radar remote-sensing technology (LIDAR) and historical storm data to produce three-dimensional maps showing which neighborhoods are most likely to flood. NOAH also provides online and mobile storm surge and tides data for more than 100 localities to help communities identify safe locations in a crisis.

Evidence of the positive impact of these efforts can be found in the southern city of Cagayan de Oro. This area was rarely affected by typhoons in the past, but in 2011, the severe tropical storm Washi caused more than 1,000 deaths. Urban rivers rose 40 feet through steep valleys, sweeping away homes lining the banks. A critical water pipeline was badly damaged, cutting off a third of the city's water supply for weeks, and six of 26 major wells were damaged. In the immediate aftermath, USAID brought in mobile water treatment plants.

Since 2011, Cagayan de Oro has made major strides to rebuild, with support from USAID's Office of Foreign Disaster Assistance and other donors. Now, USAID climate funds are helping city officials increase resilience to extreme weather events, including storms like Washi. By downscaling climate projections to the local level and incorporating climate information into planning decisions across a range of activities – from improving drainage systems to developing new water resources and restoring upstream landscapes to replenish groundwater supplies – Cagayan de Oro is successfully building back better. These efforts may soon prove critical as more tropical storms have already hit this area since Washi.

⁶ NOAH: Nationwide Operational Assessment of Hazards



New solar powered water pumps aid irrigation in Nepal

USAID reaches a dozen countries and five regional missions with direct assistance for clean energy development, including generation from renewable sources, such as wind, geothermal and solar, and support for efficient end-use technologies.

CLEAN ENERGY PROGRAMS: RENEWABLE, EFFICIENT ENERGY FOR LOW-CARBON GROWTH

Global power demand is forecast to rise 70 percent by 2035, yet 1 billion people will still lack access to electricity, versus about 1.3 billion today.⁷ This suggests that, even if the world continues along the path of “business-as-usual” energy development, we will not ensure electricity – particularly clean, healthy, secure and sustainable electricity – will reach all those who need it.

Developing countries today invest in clean energy for a variety of reasons. Renewable energy sources, such as wind and solar, can help expand energy access, diversify energy sources and increase energy security. Renewable and efficient energy technologies can help curb harmful pollution, reduce dependence on fuel imports and ease pressure on foreign currency accounts. Increasingly, developing countries are viewing clean energy technologies as a chance to leapfrog older, more polluting technologies on the way to sustainable growth and development.

Fossil fuels cause about three-quarters of the global greenhouse gas emissions linked to climate change. Yet many developing countries, even those already investing in clean energy, do not have all the institutions, policies, tools and capacities they need to measure and manage GHG emissions across economic sectors and spur sustainable low-carbon economic growth.

USAID’s clean energy work supports partner countries in building the capacity for ongoing efforts to measure and monitor GHG emissions and to initiate and scale up clean energy development to drive sustainable low-carbon growth. USAID reaches a dozen countries and five regional missions with direct assistance for clean energy development. This includes support for energy generation from renewable sources, such as wind, geothermal and solar, and support for efficient end-use technologies, such as green buildings and smart power grids.

USAID clean energy funding supports the advance of key clean energy projects, especially where there are specific barriers to investment. USAID also provides policy know-how to support the advance of critical policy and technical reforms and institutional changes needed to unlock private investment in clean energy on a large scale.

⁷ See International Energy Agency’s *World Energy Outlook* fact sheet *How will global energy markets evolve to 2035?* for [2012](#) and [2013](#)

India: Engaging Critical U.S. Partners with Clean Energy Action

With 1.2 billion people, India is the world's most populous democracy. Economic growth has been brisk over the last decade, but more growth is needed to lift 250 million people from poverty and create opportunities for 350 million young people. Energy for growth is critical, but so are health and sustainability. Two-thirds of Indians live in rural areas, where harvests and livelihoods depend on seasonal monsoon rains that are highly sensitive to climate change.

USAID plays a key role in the U.S.-India Partnership to Advance Clean Energy (PACE), supporting India at the national level and at the state level to drive large-scale clean energy growth. Working through this partnership, USAID is supporting India's goals to spur clean energy use in order to expand energy access, curb air and climate pollution and obviate the need for more fossil-fuel burning power plants.

USAID's work supports India's efforts to create policy environments that will foster clean energy innovation and attract private investment in the development and deployment of clean technology solutions. This includes

effective regulations for power grids and incentives to make renewable sources part the energy mix. It also includes policy environments and rate-setting regimes that will attract private investment in clean and efficient technologies over the long term.

USAID support also includes working with clean energy developers and financiers to unlock private investment in clean energy and mobilize private capital in the short and long term. For instance, USAID's Development Credit Authority is partnering with Northern Lights Capital to help guarantee the \$100 million India Alternative Energy Fund, which will invest in independent alternative energy projects, including wind, hydropower, solar and efficiency technologies. Eventually, this investment could add 300-400 megawatts of sustainable energy capacity – enough to power tens of thousands of Indian homes.

“Combating climate change and reducing energy poverty are two interconnected challenges that cannot be separated.”

— U.S. Secretary of State John Kerry
June 2013



Solar panels supplying renewable energy in India

Global Clean Energy: Helping Start-Ups Tap Financing to Bring Innovations to Life

Entrepreneurs play a vital role in pioneering innovations, like the renewable and energy efficiency innovations needed to drive low-carbon growth. But in many countries where USAID works, clean energy entrepreneurs face obstacles that prevent them from finding investors and bringing their business ideas to market.

To address this, the USAID-supported Private Finance Advisory Network (PFAN) helps promising clean energy entrepreneurs in developing countries connect with private investors and secure financing. With PFAN's help, more than 45 clean energy start-ups have already secured more than \$550 million in private financing to start businesses using biomass, wind, solar, small hydro, energy efficiency and other clean technologies. For example, Uganda's Barefoot Power raised more than \$13 million in private investment for its business

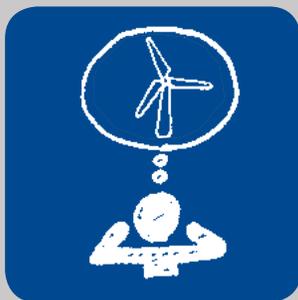
distributing solar lighting and electronics in poor, rural areas of Africa.

PFAN gives these and other clean energy start-ups access to a precious resource: a network of experts in clean energy business and finance. These experts can mentor start-ups, help them fine-tune their business plans and introduce them to potential investors. Often these experts can be found at PFAN's global clean energy financing forums, where they meet with start-ups and provide feedback on their business plans.

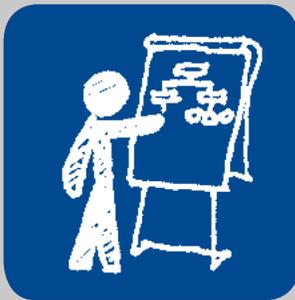
To date, PFAN experts have worked with and provided guidance to more than 200 promising clean energy businesses. The 45 of those that have secured financing will add more than 300 MW of clean energy capacity, potentially supplanting more than 2 million tons of carbon pollution per year.

PFAN

TAKES YOUR CLEAN ENERGY IDEA



HELPS WITH YOUR BUSINESS PLAN



INTRODUCES YOU TO INVESTORS



HELPS YOU SECURE FINANCING



SO YOU CAN START YOUR CLEAN ENERGY BUSINESS



AND BRING CLEAN ENERGY TO YOUR COMMUNITY



Black Sea: Joining Forces for Cleaner, More Secure Energy Supplies

A decade ago, power transmission operators in Central and Eastern Europe were highly centralized, inefficient, poorly maintained and dependent on fossil fuels. A modern transmission system can increase the efficiency of energy use and help bring new renewable energy supplies to the grid, diversifying energy sources. USAID, the U.S. Energy Association and Black Sea power transmission operators established the Black Sea Regional Transmission project, kicking off a multi-year effort to develop modern, efficient power markets to promote improved sustainability and energy security in the region.

USAID brought in technical experts to train local operators and engineers in advanced transmission modeling, renewable resource mapping and integrating clean energy into grids. The Black Sea working group, including representatives from Armenia, Georgia, Moldova and Ukraine, developed the first models of national and regional high-voltage networks and began building the capacity for shared regional transmission planning. USAID has trained more than 250 engineers in advanced transmission system modeling since the project began.

As this work evolved, it became clear that most of the Black Sea countries were too small to support a clean energy market on their own. To address this, the Black Sea partners today are working to create a shared regional grid large enough to absorb renewable power. Working group members are updating their models to simulate the wind, solar and hydroelectric generation capacity being planned for each country. And operators in Armenia, Georgia, Moldova and Ukraine are working with neighbors to develop a shared system of tariffs and regulations to facilitate clean energy transfer across borders.

Studies by the Black Sea working group have helped attract hundreds of millions of dollars in investment to the regional grid from international donors and financial institutions. This will help the Black Sea countries achieve the critical mass they need to establish an active regional clean energy market, a crucial step toward energy diversification, ultimately leading to greater energy independence and security.



Power sector experts are integrating wind energy into grids in the Black Sea region

Mexico: Gearing Up for a Clean Energy Future

Mexico is taking an increasingly proactive approach to clean energy and low-carbon growth. In 2012, the country passed a comprehensive General Law on Climate Change, committing to increase installed power capacity from renewables to 35 percent by 2024 and to halve greenhouse gas emissions by 2050.

Before and after passing the new climate law, Mexico sought U.S. cooperation and support for analytic and planning inputs into a national climate and low-carbon growth strategy. The strategy was developed and approved with the input of a broad array of Mexican stakeholders from academia, business, civil society and the general public. Through the Enhancing Capacity for Low Emission Development Strategies partnership, USAID worked with Mexican officials to develop macroeconomic models that informed the climate strategy, helping to identify the most cost-effective options for curbing GHG emissions while at the same time spurring economic growth.

USAID also supported officials in updating and improving Mexico's GHG emissions baseline, laying a solid foundation for robust yet realistic targets to curb GHG emissions in three sectors: transportation, agriculture and energy. And Mexico's Energy Ministry tapped USAID expertise to develop a roadmap for integrating renewable energy sources into the power grid. According to a recent report from *Bloomberg New Energy Finance*, renewable energy investment in Mexico in 2014 is on pace to exceed 2010's record \$2.4 billion.

Mexico will increase energy security and introduce new technologies with growth-generating potential when it diversifies to include renewable energy sources. While production has declined from Mexico's massive oil fields over the last decade, abundant solar and wind resources and ambitious renewable energy targets offer real potential for rapid renewable energy growth. To facilitate this, USAID has also worked to help local project developers, financiers and policymakers analyze specific renewable projects and spur development of bankable projects.



Mexico is seeing increased investment in renewable energy infrastructure, such as wind turbines

Power Africa: Lighting a Continent with Cleaner, Healthier Energy

Two-thirds of sub-Saharan Africa's 900 million people lack access to basic electricity, forcing them to use costly and unhealthy forms of energy, like diesel-run generators or smoky wood for indoor cooking.

Power Africa was launched by President Obama in 2013, with a commitment to double the number of people with electricity access in sub-Saharan Africa, in part by unlocking investment in the region's abundant renewable resources, including wind, solar, hydropower and geothermal, and in natural gas resources.

USAID clean energy and infrastructure funds and expertise are supporting Power Africa partners to identify and develop renewable energy resources and to advance policies and actions that will unlock energy

investment. In East Africa alone, some 9,000 megawatts (MW) of renewable sources have been identified for development by 2018, including 7,000 MW from large-scale hydropower, 1,400 MW from geothermal, and 360 MW from wind. Geothermal energy could rival hydropower within a few years, potentially providing up to 15,000 MW of power generation capacity.

As Power Africa enters its second year, it has mobilized commitments for more than \$20 billion in private investment as well as major new commitments from partners including the World Bank, the African Development Bank and the Government of Sweden. At the Africa Leaders' Summit in August 2014, President Obama announced a tripling of the original Power Africa goals, committing to add 30,000 MW of cleaner, more efficient power generation capacity and increasing energy access by adding 60 million new home and business connections.

USAID clean energy funds will continue to support Power Africa partners – which include governments, regulators and private investors, among others – to identify and develop still more clean energy resources and to build robust power markets that will attract clean energy investment now and in the future.

In Kenya, USAID helped the national electricity transmission company negotiate commercial contracts for power from the \$860 million Lake Turkana Wind project. With support from Power Africa, in 2014 Lake Turkana secured financing to develop the wind-generated power that will travel over those transmission lines to light up homes and businesses, potentially supplying up to one-fifth of Kenya's energy.



Future Kenya biomass facility will use invasive mesquite wood for renewable energy

“In partnership with African nations, we’re going to develop new sources of energy. We’ll reach more households not just in cities, but in villages and on farms. We’ll expand access for those who live currently off the power grid. And we’ll support clean energy to protect our planet and combat climate change. So, a light where currently there is darkness; the energy needed to lift people out of poverty – that’s what opportunity looks like.”

— U.S. President Barack Obama
June 2013



Colombia is improving monitoring and management of forest resources

USAID reaches more than a dozen countries and five regional missions with direct support to improve monitoring and management of landscapes, refine the tracking and measurement of GHG emissions from landscapes and develop policies and economic incentives to encourage sustainable land use and forest protection.

SUSTAINABLE LANDSCAPES PROGRAMS: REDUCING EMISSIONS FROM FORESTS AND FIELDS

Nearly one quarter of global climate pollution comes from land use, and half of that from the clearing and degrading of tropical forests. For many developing countries where USAID works, land use is the single largest source of greenhouse gas (GHG) emissions, and deforestation is the largest source of land-use emissions.

Improving land management and reducing deforestation curbs greenhouse gas emissions, and it provides important human and environmental co-benefits. Among these benefits are food security and livelihood options for the roughly 1.5 billion people around the world who depend on forest resources. Among these, some 350 million of the world's poorest people rely heavily on forest resources for subsistence and survival.

USAID Sustainable Landscapes funding focuses on more than a dozen priority countries, particularly those with significant GHG emissions from tropical forest loss. This assistance is helping countries improve their monitoring and management of forest resources, refine the tracking and measurement of GHG emissions from forest loss, and introduce policies and economic incentives to encourage sustainable forest use and protection.

USAID climate support is also helping pioneer new approaches for incentivizing private investment in sustainable forest use and reducing GHG emissions from forest loss. The Tropical Forest Alliance 2020 (TFA 2020) is a public-private alliance initiated by USAID and the Consumer Goods Forum global network of companies. Today TFA 2020 is engaging more than 20 major government, business and civil society partners to eliminate deforestation from the production of key global commodities.

USAID climate experts also supported USAID's Development Credit Authority in developing an innovative risk-reducing mechanism to mobilize the \$134 million Althelia Fund. The Althelia Fund is now making private financing available to projects that Reduce Emissions from Deforestation and Forest Degradation (REDD+).

Global Tropical Forest Alliance 2020: Mobilizing Business to Curb Deforestation

According to a recent study published in *Science* magazine, the world lost the equivalent of 50 soccer fields of forest every minute of every day from 2000 through 2012. The greatest losses were in tropical forest areas.⁸ The creation of protected areas has saved vast tracts of forest over the years, but too often when one area is protected, forest clearing just moves to nearby unprotected areas.

Until the underlying economic forces that drive deforestation are addressed, forest loss will likely continue at an alarming rate. Among the largest global drivers of deforestation is the production of large-scale agricultural commodities such as palm oil, beef, soy and paper and pulp, which together have historically caused roughly 40 percent of tropical forest loss.

The Tropical Forest Alliance 2020 (TFA 2020) brings the public-private partnership model to the challenge of curbing tropical forest destruction. TFA 2020 is a public-private alliance catalyzed by the United States and the Consumer Goods Forum, a network of more than 400 major global companies. Today, TFA 2020 is directly engaging more than 20 major partners, including governments, businesses and civil society organizations from around the world.

TFA 2020 is committed to mobilizing resources and action from all sectors to eliminate deforestation from the production of major commodities. In 2013, in support of TFA 2020, USAID provided major support to the innovative Global Forest Watch (GFW) tool developed by World Resources Institute (WRI), helping mobilize nearly \$40 million more from other countries and organizations.

GFW is a free, online forest monitoring and alert system that uses satellite technology, open data and crowdsourcing to bring a new level of transparency to global forests. Developed by WRI with Google, the University of Maryland and other partners, GFW allows civil society groups, governments, businesses and communities – inside and outside forests – to access timely, high-quality information about what's happening on the forest floor.

In other areas too, TFA 2020 is seeding game-changing dialogues on tropical deforestation. In Indonesia, TFA 2020 hosted a summit that drew hundreds of government, business and civil society representatives, including some of the world's largest palm oil and commodities businesses. One year later, in September 2014, Indonesia's Chamber of Commerce and Industry

and four of the world's largest palm oil trading companies publicly pledged to eliminate from their supply chains palm oil produced on newly deforested lands.



A man stands atop a truckload of palm fruit in Indonesia

⁸ See *Science* magazine article [High-Resolution Global Maps of 21st-Century Forest Cover Change](#)

Indonesia: Local Forest Management Builds a Base for National Results

Indonesia is home to the world's third largest expanse of tropical forest and extensive peatlands that sequester large volumes of carbon. But with a population of 250 million, and one in seven people living in poverty, Indonesia is under enormous pressure to generate economic growth and provide jobs and services for its people. With recent deforestation, drainage of peat swamps and fires to clear land for agriculture, Indonesia has gone from being a net carbon sink to being one of the world's largest carbon emitters.

USAID's Indonesian Forestry and Climate Support project (IFACS) has worked with local and regional governments in Indonesia since 2010 to find ways to curb carbon pollution from deforestation and to improve livelihoods for forest-dependent communities on the islands of Kalimantan, Papua and Sumatra.

Much of this work involves direct engagement with district-level officials and local stakeholders to develop new ways to provide incentives for low-carbon development, including more sustainable land-use planning and decision-making at the district level, as well as private sector investment in forest conservation.

IFACS had made significant progress, with more than 1 million hectares of natural tropical forest and peatland under improved management. Central to this result, 8,000 people in forest-dependent communities are seeing improved economic benefits from alternative or modified livelihood activities. New activities have included forest-friendly cacao farming practices, diversification of crops to include high-value products like patchouli, and further processing of products like coconuts to keep more of the value added to products within local communities.



A degraded landscape shows evidence of deforestation in Indonesia

CARPE: Managing Central Africa's Forests Across Borders and Conflict Zones

The Central Africa Regional Program for the Environment, or CARPE, is the flagship U.S. forests, biodiversity and climate change program in Central Africa's Congo Basin. Up to three-quarters of all people live in poverty in this conflict-prone region, where the world's second largest tropical forest stretches across national borders into nine countries.

Central Africa's forests are under threat from unregulated logging and mining and slash-and-burn practices for subsistence agriculture. To address this, CARPE works with national governments, regional authorities and civil society partners to strengthen forest governance and management at all levels. At the government level, CARPE works to help national and regional authorities develop effective policy and legal frameworks. At the community level, CARPE partners work closely with rural communities to develop land management plans, sustainably intensify agricultural production and increase livelihood options.

Better forest management in this region will translate into more sustainable livelihoods for some of Africa's poorest people. Over time, it will also help to conserve habitat for some of the world's most endangered species and reduce greenhouse gas emissions from forest loss.

In all, CARPE supports a portfolio of eight landscape-level programs targeting areas of high conservation

value for endangered flora and fauna. Since CARPE's start in 1997, these programs have contributed to the conservation and improved management of more than 50 million hectares of tropical forests. This is estimated to have reduced carbon emissions and increased carbon sequestration by more than 100 million tons of carbon-dioxide-equivalent per year over the last few years.

More recently, CARPE's success has helped spawn several pilot projects to reduce greenhouse gas emissions from deforestation using the REDD+ framework, a global policy approach designed to curb tropical deforestation and related GHG emissions. These projects have worked with private organizations, such as Wildlife Works, and have attracted investment from bilateral donors, including Norway, Sweden, Belgium, Germany, Netherlands and the United Kingdom, and from multilateral donor funds at the World Bank and the African Development Bank.

CARPE's third strategic phase, from 2013 through 2020, is working to strengthen local institutions and capacities to ensure long-term forest protection. By helping local governments and communities build their own capacity to manage resources, CARPE will continue to improve livelihoods, reduce GHG emissions, sequester carbon and conserve forests and biological diversity for decades to come.



People in the Democratic Republic of the Congo using remote-sensing technology

Colombia: The Low-Carbon Economy, a New Model for Growth

Colombia, a key U.S. partner in Latin America, is a global leader on climate change and low-carbon growth. With a 40-year civil conflict winding down and a peace process advancing since 2012, Colombia today is focused on strengthening economic growth and sustainability. USAID supports Colombia to implement a sustainable and inclusive peace through democratic institutions, reconciliation, rural economic growth and environmental resilience.

On climate change, Colombia tapped USAID support to develop the Colombian Low Carbon Development Strategy and is now working to implement this strategy across the energy, mining, agriculture, housing, industry and transportation sectors. Specialists in the relevant ministries are working on specific policies and actions to be included in Colombia's National Development Plan for 2015 – 2020.

Colombia is a forest-rich, natural-resource exporter, and the government is taking a whole-economy approach to low-carbon growth. The Colombian Low Carbon Development Strategy aims to unlock investment in clean energy, encourage sustainable economic activities in forested areas and reduce greenhouse gas emissions from tropical deforestation.

Forests are a precious resource in Colombia, one of the world's most bio-diverse countries. Forest conservation is often combined with poverty reduction and economic development programs in isolated rural areas. This is the case with the BIOREDD+ program (Biodiversity – Reducing Emissions from Deforestation and Forest Degradation), located in Colombia's Pacific Coast region, at the center of one of the world's biological hotspots. Many of Colombia's most vulnerable people – which include nearly 5 million Afro-Colombians and 1 million indigenous people – live in the Pacific Coast region. These groups suffer disproportionately from poverty and violence.

BIOREDD+ is developing and financing multiple projects that will reduce GHG emissions from deforestation,

improve livelihood options and increase social services for communities across more than 800,000 hectares of forest, an area larger than the state of Virginia. Some 20,000 people from 19 Afro-Colombian and indigenous communities are participating in the BIOREDD+ projects, and in return for conserving forest, they will gain access to education, new livelihood options and other sources of income. Among the new income-generating options being developed are fisheries and high-value products such as cacao and açai.

Over the last five years, Colombia's government, in partnership with USAID, has invested more than \$3 million in the regions and communities where BIOREDD+ is working. Today project participants are negotiating with private companies interested in investing some \$15 million. USAID is providing technical support so BIOREDD+ participants can learn to monitor and document forest carbon stocks and demonstrate their success curbing GHG emissions. In addition, USAID's Development Credit Authority designed an innovative credit guarantee to ensure BIOREDD+ participants can access the private financing they need to develop new economic opportunities.

Beyond forest carbon, Colombia has been a leader in encouraging officials at the sub-national level to engage in low-carbon planning and identify opportunities for low-carbon growth. Huila, in the central Andean plateau, is drawing on USAID support to develop Colombia's first sub-national low-carbon growth strategy, which includes forest protection and also clean energy projects, covering energy efficiency, energy finance and off-grid renewables.

At the national level, Colombian officials aim to encourage and build upon sub-national action plans such as Huila's. At the same time, USAID's Colombia Clean Energy Program is supporting officials working to establish policy and regulatory frameworks for clean energy development, to increase renewable energy provision in non-connected areas and to stimulate investment in clean energy development.



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