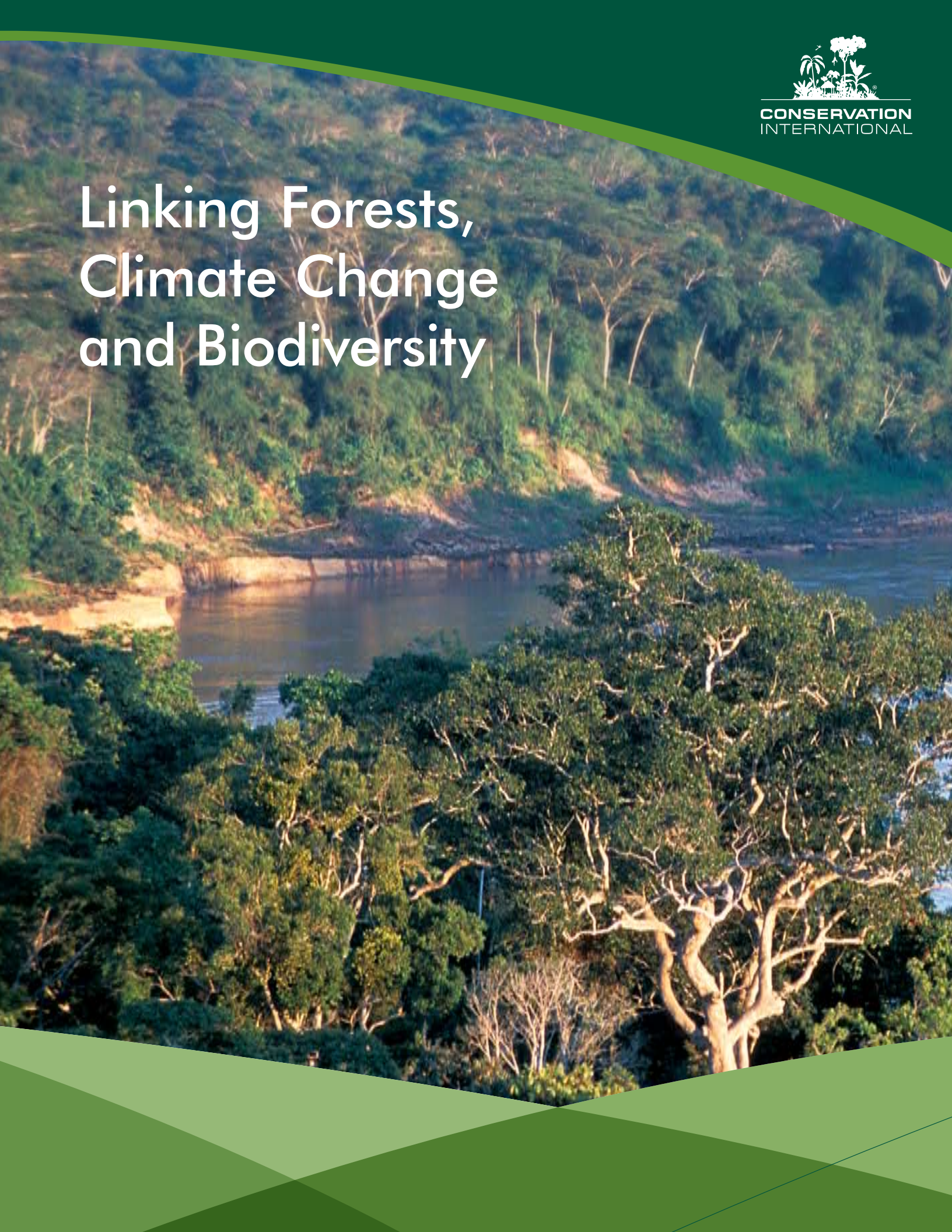




CONSERVATION
INTERNATIONAL

Linking Forests, Climate Change and Biodiversity





Linking Forests, Climate Change and Biodiversity Conservation

Throughout history, the Earth's natural ecosystems have regulated the global climate. Now human-induced climate change threatens those very ecosystems and the biological diversity at their foundation.

The unprecedented amounts of greenhouse gases being emitted into the atmosphere by industrial activities and deforestation are overwhelming the ability of the planet's natural systems to maintain a stable climate. As a result, global climate change now constitutes the greatest danger to the health of the planet and all the life it sustains, including people. Sea levels and ocean temperatures are increasing, subjecting coastal areas to flooding and more intense storms, destroying fisheries, and bleaching coral reefs. Glaciers and ice caps are melting, affecting human water supplies and reducing habitat for Arctic species such as polar bears, while drier soils and more unpredictable rainfall are decreasing crop yields and threatening food security in some of the world's poorest regions. Climate change also threatens the world's biological diversity amid a global extinction crisis caused by large-scale destruction of tropical forests, habitat loss, unsustainable harvesting, and pollution.

Prompt action on an unprecedented scale is urgently needed to prevent dangerous impacts on human welfare and biological diversity. Avoiding catastrophic impacts of climate change will require cuts in global greenhouse gas emissions far deeper than levels previously considered. A diverse portfolio of aggressive mitigation strategies will be necessary, including renewable energy sources and greater energy efficiency, along with forest and land-based mitigation activities. Immediate and substantial efforts also are needed to help humans and all other life on Earth adapt to altered environments. Global warming and sea level rise will continue for centuries even if emissions were to stabilize today. Therefore, adaptation actions are essential to help communities and ecosystems moderate, cope with, or take advantage of actual or expected climate changes.

Tropical forests can make a significant contribution to both mitigation and adaptation strategies for climate change, and must be a meaningful part of any climate solution. The burning and clearing of tropical forests is currently a major but often unrecognized source of greenhouse gas emissions. An estimated 14 million hectares of forests are cleared each year, releasing up to 1.5 billion tons of CO₂ into the atmosphere. That accounts for roughly 20 percent of total global greenhouse gas emissions, or more than the emissions from all of the world's cars, truck and airplanes combined. In some developing tropical countries, such as Brazil and Indonesia, the conversion of forests to other land uses is the single greatest source of greenhouse gas emissions, accounting for at least 70 percent of total country emissions.

Reducing deforestation rates and conserving intact forests could make a significant dent in reducing global greenhouse gas emissions. The replanting of native trees and plants in areas where forests were previously cleared also would lower atmospheric carbon dioxide levels. Through photosynthesis, growing trees and plants absorb CO₂ from the atmosphere and store it in wood, leaves, roots and soils. Both actions – reducing emissions from deforestation, and increasing carbon storage or sequestration through reforestation – offer cost-effective and immediate steps to help curb climate change.

Forest conservation and restoration also offer other benefits. Protecting forests preserves the habitat of much of the world's biological diversity, and helps mitigate flooding, reduce soil erosion and conserve water resources critical to human communities. Planting trees in the agricultural lands surrounding intact forests – as diverse forest plantations or multi-strata agroforestry systems – can ensure the sustainable supply of fuel wood, timber and other products for local communities and reduce pressure on nearby forests while serving as additional habitat for some plant and animal species. Agroforestry systems also help diversify food production, enhancing food security and generating new sources of revenue for farmers. In addition, both reforestation and agroforestry activities can result in increased employment, new and sustainable revenue streams for governments, private landowners, and communities, as well as the diversification of local economies often dependent on a single source of income.

Partnerships for climate change mitigation, biodiversity conservation and sustainable development

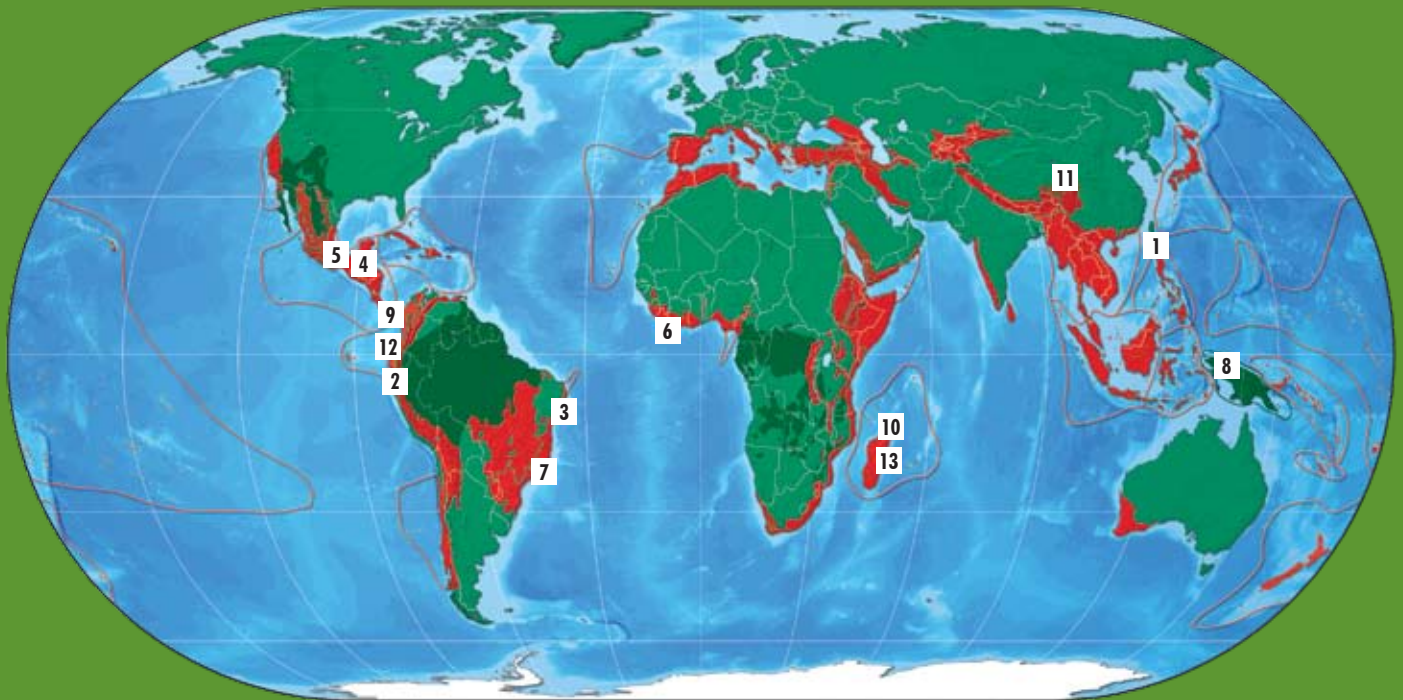
To achieve the multiple goals of climate mitigation, biological diversity conservation and sustainable development, Conservation International (CI) works with a wide range of partners including local and national governments, private corporations, non-governmental organizations, individual landowners, and indigenous and local communities in a series of forest carbon projects around the world. These projects integrate forest conservation, reforestation, forest restoration and agroforestry at the regional or national level to reduce atmospheric carbon and benefit both human welfare and biological diversity. Where possible, these projects also combine mitigation activities with adaptation efforts, to allow both human communities and biodiversity to better cope with ongoing climate change. With our partners, our goal is to strengthen and significantly scale-up forest conservation and restoration activities globally to protect the ecosystems and biological diversity that are crucial to climate regulation and sustainable development.

Local and national governments play key roles in promoting innovative policies that recognize the important mitigation potential of tropical forests, while expert conservation partners lead projects on the ground and provide valuable experience in project design, locally-appropriate technology, stakeholder engagement, and monitoring of biodiversity and climate benefits. CI provides capacity building, technical support, and scientific knowledge to partners to help catalyze field-based activities to achieve successful outcomes for climate change mitigation and adaptation. Together, these unique partnerships offering unparalleled scientific, technical, political and on-the-ground expertise are leaders in the design and management of innovative forest carbon projects.

The forest carbon projects – four underway and nine others in planning – span the globe from Africa to Asia to Latin America and include a broad range of forest-based mitigation activities. All are designed to conform to the rigorous Climate, Community and Biodiversity Standards and create real, measurable, and verifiable emissions reductions with concrete benefits for local communities and biological diversity conservation.

The four projects already being implemented (in Madagascar, China and Ecuador) include more than 700,000 hectares of forest and will create an estimated 19.7 million tons of CO₂-equivalent emissions reductions over 30 years. New projects are currently being designed in the Philippines, Liberia, Guatemala, Brazil, Peru, Mexico, Colombia, and Indonesia, which together could result in the additional conservation of more than 2 million hectares of forest and the reforestation of an estimated 45,000 hectares of degraded land. There are also exciting opportunities to significantly scale up these activities in these and other countries. Our hope is that these innovative projects that combine mitigation and adaptation strategies with conservation of biological diversity will be a model for broader efforts to significantly curb climate change and protect the biological diversity on which life depends, while simultaneously improving the economic well-being of forest-dependent communities.

CI's Forest Carbon Projects



1. Sierra Madre, Philippines
2. Alto Mayo, Peru
3. Pernambuco, Brazil
4. Maya Biosphere Reserve, Guatemala
5. Selva Lacandona, Mexico
6. Liberia
7. Muriqui Habitat Corridor, Brazil
8. Mamberamo Basin, Indonesia
9. Bogota Conservation Corridor, Colombia
10. Makira Forest, Madagascar
11. Teng Chong, China
12. Chocó-Manabí, Ecuador
13. Mantadia Corridor, Madagascar

High-Biodiversity Wilderness Areas

Vast regions of relatively undisturbed land with many species found nowhere else. These areas still claim at least 70 percent of original vegetation and have low human population densities.

Biodiversity Hotspots

Earth's biologically richest places, with high numbers of species found nowhere else. Hotspots face extreme threats and have already lost at least 70 percent of their original vegetation.

Existing Forest Carbon Projects



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Madagascar Conservation Carbon Projects

Separated from any land mass for more than 160 million years, the island of Madagascar is a virtual laboratory of evolution in isolation. Roughly 92 percent of Madagascar's mammals, 89 percent of the island's plants and almost all of the reptiles and amphibians are found nowhere else on Earth. Many of the forests that provide habitat for Madagascar's remarkable endemism are virtually gone, leaving species such as the greater bamboo lemur (*Prolemur simus*), white-collared lemur (*Eulemur albocollaris*) and Perrier's sifaka (*Propithecus perrieri*) listed as Critically Endangered by the IUCN. Eastern Madagascar has been hit particularly hard, with decades of forest destruction and high local deforestation rates resulting in only 8.5 percent of its original forest cover remaining.

The problems associated with deforestation in Madagascar affect more than just the country's biological diversity. The direct cause of most deforestation is the small-scale agricultural cultivation of hillside rice, a practice known as 'tavy'. The continued expansion of this practice on former forest land reduces soil fertility, increases erosion and affects water supplies. After a few years, tavy systems become unproductive and farmers must clear new areas of forest for agriculture. Emissions from deforestation and land use change comprise a substantial portion of Madagascar's total greenhouse gas output.

To address the problems of deforestation and the accompanying greenhouse gas emissions, CI and partners have launched projects in the Makira Forest area and Mantadia Biodiversity Corridor that mitigate climate change and conserve biological diversity, while simultaneously addressing the livelihood needs of local inhabitants.

The Makira Forest Project

In the country's northeastern forest region, the government of Madagascar is working with the Wildlife Conservation Society (WCS) and CI to implement the Makira Forest Project. This venture seeks to conserve a 4,600-square-kilometer region by promoting sustainable natural resource management and legal forest protection mea-



sures. The goal is to create a protected conservation area that preserves the biological richness of Makira and guarantees long-term connectivity to other protected forests. The heart of the project is reducing deforestation from agricultural encroachment in the 350,000-hectare Makira Forest. In addition, the project seeks to stabilize natural resources in the area through responsible land-use planning, identify and implement innovative financing mechanisms and promote private sector initiatives such as ecotourism.

Protecting the remaining forests and reducing the rate of forest loss reduces the quantity of CO₂ released into the atmosphere. Specific activities to reduce deforestation include training on permaculture practices that allow farmers to continually produce good harvests from the same land as opposed to cutting new fields every few years, as well as forest conservation measures.

Climate Benefits An independent assessment by Winrock International indicates that 9.5 million tons of CO₂ emissions could be avoided through forest protection activities of the Makira Forest Project. Investors benefiting from emissions avoidance through the project include Mitsubishi Group, NavTech, and the music band Pearl Jam.

Community Benefits The project empowers local communities to control and manage their natural resources in a sustainable manner, creating the potential for new revenue opportunities. In addition to training in improved cultivation practices, other livelihood benefits include improved irrigation systems for lowland rice fields, direct economic benefits through employment opportunities, and promotion of ecotourism in the area.

Biological Diversity Benefits Madagascar already is considered the world's top priority for primate conservation due to its species diversity and endemism. This project seeks to maintain the largest contiguous tract of forest in eastern Madagascar by reconnecting fragments, thus providing habitat for the threatened species it contains.

The Mantadia Corridor Project

The Ankeneny-Zahamena-Mantadia Biodiversity Conservation Corridor and Restoration Project in east-central Madagascar links three crucial national parks to benefit the flora and fauna, as well as human populations. Conceived and implemented in close partnership with the government of Madagascar and local communities, the project combines reduced deforestation activities in a core forest area with reforestation and agroforestry systems on previously degraded lands. The project's goals are to sustain local livelihoods and native biological diversity while mitigating climate change. It will include components eligible for both Certified (CDM) and Voluntary Emissions Reductions. The World Bank BioCarbon Fund has purchased some of the project's initial carbon credits from both forest restoration and conservation activities. The income from selling carbon offsets will provide incentive for the government and local communities to protect the remaining forests and the services they provide to local residents.

Under the project, more than 425,000 hectares of standing rainforest are being protected, while another 5,000 hectares are being reforested with native species and fruit gardens. These conservation steps will help protect threatened species of amphibians, birds and mammals, including lemurs found only on Madagascar, while also improving agriculture productivity, developing ecotourism, and increasing the sustainable production and sale of fuel wood, fruits and high-value timber.



Climate Benefits Over the 30-year life of the project, the forest conservation and reforestation components are expected to generate a net emissions reduction benefit of at least 10 million tons of CO₂.

Community Benefits The project will create 200 jobs over a seven-year period, improve agriculture production, develop ecotourism and increase the sustainable production and sale of fuel wood and non-timber forest products. In addition, income from forest carbon credits provides incentive for conservation of the region's rainforests, which contributes to soil and water conservation.

Biological Diversity Benefits The project helps consolidate a forested corridor connecting three national protected areas that are crucial for the conservation of Madagascar's unique biological diversity, including the major habitat of endemic species such as the indri (*Indri indri*) and other threatened lemurs.

Tengchong, China

The Mountains of Southwest China Hotspot, one of the world's 34 biological diversity hotspots, stretches over 161,500 miles from southeastern Tibet through western Sichuan Province and into central and northern Yunnan Province. Covering almost 10 percent of China's land mass, the hotspot contains almost half of the nation's bird and mammal species, including threatened animals such as the giant panda (*Ailuropoda melanoleuca*), golden snub-nosed monkey (*Rhinopithecus roxellana*), snow leopard (*Uncia uncia*), and China's only remaining population of Bengal tiger (*Panthera tigris*). Within it lies the Teng Chong region of Yunnan Province, which features forests, meadows and mountains, and a range of climates that vary from subtropical to alpine. Teng Chong also is home to 16 ethnic minority groups who are traditional stewards of the land. In Yunnan Province, problems include unsustainable farming practices and overgrazing that cause erosion and a loss of habitat for threatened species. Creating a successful conservation and climate change mitigation strategy for the region requires addressing the needs of generally impoverished local communities while restoring native forests, soil nutrients and watersheds.

In response to the conservation challenges present in the region, the Chinese government's Yunnan Forestry Department, along with partners CI and The Nature Conservancy, are applying the first small-scale forestry project methodology to be validated according to the Kyoto Protocol's Clean Development Mechanism (CDM). The project is reforesting degraded agricultural lands in the buffer



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area around a core forest protection zone. Tree planting began in July 2006. In total the project will restore 467 hectares of mixed-use native forests around the Gaoligongshan Nature Reserve and produce timber resources and fuel wood for local communities. The project is a departure from the Chinese government's efforts to promote single-species tree plantations, as the mix of native species will be more beneficial to biological diversity and avoid many of the potential insect and disease problems encountered by monoculture forests. It also is the first project worldwide to be independently certified with the Climate, Community & Biodiversity Standards, receiving a "Gold" rating, the highest possible. The project's participatory approach includes local farmers in the planning and deci-



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sion-making. These local stakeholders also are part of the newly formed provincial carbon sequestration office, which oversees the project's implementation, organizes training, and coordinates the measurement and monitoring of carbon benefits.

Climate Benefits Restoring 467 hectares of native forests will sequester an estimated 167,000 tons of CO₂ over the 30-year life of the project. In addition, the managed firewood supply created as part of the project will generate synergistic emissions benefits by decreasing emissions from cutting and burning of other forested areas.

Community Benefits Designed specifically to incorporate the needs of local communities, the Teng Chong project will benefit more than 2,000 residents from five villages by providing long- and short-term income from reforestation jobs and the sale of wood and non-timber forest products. A portion of the project will generate firewood, an important source of fuel for local farmers. In addition, the project will provide technical training for local farmers to successfully plant and maintain forests while protecting soils from erosion and maintaining healthy watersheds.

Biological Diversity Benefits The Teng Chong project will help conserve a priority area for globally important biological diversity. Forest restoration with native tree species will establish a buffer zone for the Gaoligongshan Nature Reserve and suppress encroaching invasive weeds. Newly connected forest corridors will provide habitat for species to react to the impacts of climate change, such as droughts and increased forest fires.

Chocó-Manabí, Ecuador

Northwestern Ecuador is one of the world's most important areas for biological diversity. The region is home to more than 2,000 species of plants, over 450 species of birds and an array of mammals and reptiles – many of which are threatened with extinction. The Andean spectacled bear (*Tremarctos ornatus*) and mantled howler monkey (*Alouatta palliata*) are among the threatened species found nowhere else on Earth. The region's forests, also highly threatened, are located at the interface of two global "hotspots" for biological diversity: the Tropical Andes and the Tumbes-Chocó-Magdalena Hotspots. Over the past 35 years, deforestation caused by logging, agriculture and population growth has resulted in the loss of more than two-thirds of the region's original forest cover. Today, much of the area has been converted to pasture and commercial agriculture – or simply left abandoned – leaving only highly degraded and stunted secondary vegetation.

In order to restore these degraded lands and reforest important gaps in the corridor, a group of partners has created the Chocó-Manabí Corridor Reforestation Conservation Carbon project (also known as ChoCO₂). The ChoCO₂ project will reforest at least 265 hectares of forest land in two sites in the coastal plain and western foothills of northwestern Ecuador. The project sites are comprised of abandoned pasture and agricultural lands overgrown with introduced African pasture grasses and low shrub-like vegetation. The project

sites include the Maquipucuna Reserve, a cloud forest ranging from 1,000 to over 2,800 meters in elevation owned by the Maquipucuna Foundation. At this site, the project will plant a mixture of 15 native tree species on former ranch lands that will fill habitat gaps and reconnect forest fragments. These efforts will increase the altitudinal gradient covered by primary and secondary forests, facilitating species migration as climatic conditions change.



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These privately owned lands where reforestation will take place were deforested prior to 1990, meeting a key eligibility requirement of the Kyoto Protocol for Afforestation/Reforestation (A/R) projects under the Clean Development Mechanism. The project is using the approved AR-AM0007 methodology, which applies to lands currently under agricultural or pastoral use. To date, the project has planted the first 38 hectares of land and will continue planting in 2008 and 2009. Establishing value through carbon offsets provides the only economic incentive for reforesting these lands.

Climate Benefits Healthy, intact forests store carbon absorbed from the atmosphere to play a unique role in mitigating the effects of climate change. Over the 30-year life of the project, the reforested areas will store at least 80,000 tons of CO₂, the majority of which has been purchased by the Ricoh Corporation of Japan.

Community Benefits The project employs local community members for seed collection, nursery establishment, planting and maintenance. In addition, reforested project sites help support economic activities that rely on healthy forests such as ecotourism, which has become an increasingly important income source for nearby communities. Reforestation also protects sources of clean water for local communities and reduces water-borne diseases.

Biological Diversity Benefits Over the long term, the structural and microclimatic conditions created by these forest plantations will reduce forest edge effects and expand habitat for native plant and animal species. Creating connectivity among fragmented habitats will help consolidate the conservation corridor, which is critical for species requiring large expanses of contiguous forest.

Forest Carbon Projects Under Development



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Sierra Madre, Philippines



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On the Philippine island of Luzon, the 1.4 million-hectare Sierra Madre Biological Corridor accounts for more than 40 percent of the country's remaining old-growth forest. The corridor is home to more than 400 species of wildlife, 153 of which are found nowhere else on Earth. A partnership between the Philippine Department of Environment and Natural Resources, local People's Organizations,

the Quirino provincial government, and non-government organizations including PEDAI and CI has been formed to mitigate a variety of threats to the newly declared Quirino Protected Landscape through an integrated forest carbon project. Designed to provide multiple benefits including carbon sequestration, water and soil conservation and income-generation for local communities, the proj-

ect is working closely with local communities to implement interventions that have long-term climate and livelihood benefits. The project will protect existing primary forest and reforest an estimated 7,000 hectares of degraded land. This will be accomplished through the use of native tree species in forest plantations, as well as diverse agroforestry systems intended to reduce human pressure on the existing forest by creating alternative sources of fuel wood and timber as well as new fruit crops for consumption and income generation. The project has already begun a 20-hectare pilot implementation phase, with half of the area planted to agroforestry (fruit trees) and the remainder under native species, and will scale up implementation in 2008.

Climate Benefits Over its 30-year life, the project will reforest 5,000 hectares, protect another 5,000 hectares of old-growth forest from deforestation and degradation, and promote agroforestry on another 2,000 hectares to create a sizable net reduction in atmospheric carbon dioxide.

Community Benefits The project will provide income alternatives through direct project employment, improved farm production and agroforestry systems, and reliable access to legitimate and sustainable wood sources. Downstream agricultural interests will benefit from improved protection of crucial water sources.

Biological Diversity Benefits The improved forest connectivity from the project will benefit a variety of species vulnerable to extinction, including Cantor's giant soft-shelled turtle (*Pelochelys cantorii*) and the Philippine eagle (*Pithecophaga jefferyi*).

Alto Mayo Forest, Peru

The Alto Mayo River, flowing through the province of San Martín in northern Peru, passes through Andean forest areas of high biological diversity on its way to the Amazon basin. Within the upper elevation areas of the watershed, the Alto Mayo Protected Forest contains habitat for many endemic species that are under threat from illegal land-clearing. Stresses on the lower elevation portions of the basin have also dramatically affected the availability of fresh water for municipal use and downstream agriculture. GTZ, the German development agency, has been working in the sub-watersheds of the Alto Mayo to combat deforestation and improve water supplies through a Payment for Environmental Services initiative. With the support of

GTZ and local and provincial governments, CI is designing a synergistic project focusing on reducing greenhouse gas emissions from deforestation and land use change in the watershed. The project will reduce deforestation by negotiating conservation agreements with local inhabitants who are encroaching on intact

forests, planting native species on deforested areas, and designing agroforestry systems to expand tree cover and carbon stocks throughout the watershed. Current activities include updating deforestation analyses, identifying priority areas for conservation and reforestation, and measuring forest carbon stocks.



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Climate Benefits Over the life of the project, greenhouse gas emissions from deforestation and degradation will be reduced, and atmospheric carbon will be sequestered through the planting of native tree species and agroforestry systems. Work will initially focus on the Yuracyacu sub-watershed, an area of about 30,000 hectares.

Community Benefits The project will restore watersheds crucial for municipal and agricultural water supplies (a key concern of local governments), while also generating alternative income streams from diversified farming systems.

Biological Diversity Benefits Improved forest habitat from the project will help a variety of species, including the threatened yellow-tailed woolly monkey (*Oreonax flavicauda*) and Andean titi monkey (*Callicebus oenanthe*).

Pernambuco, Atlantic Forest, Brazil

The Pernambuco region of northeastern Brazil's Atlantic Forest, known for its biological diversity, has been under cultivation since the 17th century for sugar cane and other crops. As a result, only 4.6 percent of the original forest cover remains (less

than 3,000 square kilometers), mostly in small pockets surrounded by agriculture. These remnants provide the last viable habitat for a large number of globally threatened species. An alliance of sugarcane producers, local and international non-

government organizations, research organizations, and government agencies, known as the Pacto Muriçá, has identified a unique opportunity to reforest at least 1,800 hectares of private lands currently devoted to the industrial cultivation of sugar cane. By restoring forests on lands between existing forest remnants, the project will create habitat connectivity for wildlife, including many endemic bird species. Reforestation with native trees will also increase the sequestration of carbon dioxide, helping to mitigate the impacts of climate change, as well as help landowners comply with poorly-enforced land protection laws. Portions of the reforested lands will be designated as legally-protected Private Natural Reserves.

Climate Benefits Over the 30-year life of the project, the restoration of at least 1,800 hectares of former agricultural land in the Brazilian Atlantic Rainforest will significantly increase the amount of carbon stored on the landscape.

Community Benefits Restoring riparian areas will result in cleaner and more plentiful water for communities. In addition, the project is expected to generate jobs for local workers, while landowners will benefit from compliance with Brazilian forest protection laws.

Biological Diversity Benefits The project is expected to restore some of the highly fragmented habitat of the corridor that is home to the Alagoas foliage-gleaner (*Philydor novaesi*) and at least 14 other globally threatened species.



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Maya Biosphere Reserve, Guatemala

The Maya Biosphere Reserve is the epicenter of the ancient Maya civilization, and also Central America's largest protected area, covering roughly 2.1 million hectares. Established in 1990, the reserve is part of a tri-national system of protected areas in Guatemala, Belize, and Mexico. Despite having legal protection, the reserve is under increasing threat from agricultural encroachment and illegal logging that reduces forest cover, increases fragmentation and diminishes the biological diversity of the park. In addition, the use of fire to clear land causes large emissions of carbon into the atmosphere, contributing to climate change. In response, the Wildlife Conservation Society, CI, and other NGO partners, in collaboration with the Guatemalan government, are designing



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a project that reduces deforestation rates and improves the management of the Maya Biosphere protected area. Through the sale of carbon offsets, the project seeks to mitigate management problems in the national park units caused by a lack of financial resources. While initially focusing on the threat-

ened eastern portion of the Laguna del Tigre National Park, at full implementation the project will include other areas and also will reforest private lands along the Maya Jaguar Corridor to provide additional habitat for wildlife, increase carbon sequestration and improve the livelihoods of local communities.

Climate Benefits The project is initially focused on reducing high rates of deforestation in the Laguna del Tigre National Park, reducing emissions of carbon dioxide from forest clearing and land conversion.

Community Benefits The project is currently exploring mechanisms to ensure equitable benefit-sharing from carbon revenues and forest protection with local communities and residents.

Biological Diversity Benefits Forest conservation and restoration in the Maya Biosphere will protect a variety of important species threatened by habitat loss, including the jaguar (*Panthera onca*) and the national symbol of Guatemala, the resplendent quetzal (*Pharomachrus mocinno*).

Selva de Lacandona, Mexico



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Covering approximately 1.8 million hectares, the Selva de Lacandona is a region of rich biological diversity and home to several indigenous peoples, including the Lacandon group that consists of fewer than 2,000 members. Selva de Lacandona also has important populations of tapir, peccary, jaguar, and spider

and howler monkeys. The diverse forests are under pressure from illegal land incursions for agriculture, unsustainable cattle ranching, and unauthorized logging. Local conservation and community organizations, in partnership with CI, will implement an integrated project to reduce carbon dioxide emissions

from deforestation and sequester additional carbon on degraded agricultural areas. The focus of the conservation efforts is La Cojolita, a forested mountain chain that serves as a corridor between national parks in Mexico and Guatemala. Forest protection in La Cojolita will be increased through the use of conservation agreements with local communities that are placing pressure on the forest. By planting trees on degraded lands adjacent to the intact forest, especially through locally-appropriate agroforestry systems, the project will also sequester additional carbon and improve habitat connectivity. The project is currently quantifying baseline and future carbon stocks and conducting community outreach to refine project interventions.

Climate Benefits The project will reduce deforestation and associated greenhouse gas emissions in the 40,000 hectare Sierra la Cojolita and undertake reforestation on 10,000 hectares of communal lands, resulting in a net increase in the amount of sequestered carbon on the landscape.

Community Benefits The project will provide jobs to local inhabitants, train farmers in improved grazing and cropping practices that enhance productivity, and promote sustainable ecotourism activities to generate new sources of income.

Biological Diversity Benefits Improved forest habitat connectivity will help a variety of species, including many threatened animals like the endangered Baird's tapir (*Tapirus bairdii*) and two vulnerable frog species (*Craugastor* spp.), as well as at least 15 vulnerable or endangered plants.

Liberia's Protected Areas

Liberia contains 4.5 million hectares of lowland tropical forest that is a major portion of the Upper Guinea forests of West Africa. These forests are immensely important for their biological diversity, containing the last long-term viable populations of several endemic species. These forests also provide important ecosystem services and hold the potential to help reduce high levels of poverty in the country. As the country recovers from the devastating impacts of a 14-year civil war, the government is working to increase funding and capacity to effectively manage natural resources for the benefit of the population and biological diversity. The government of Liberia has been working to design its national forest strategy, known as the



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“3C” approach, to include areas zoned for Community, Conservation, and Commercial uses. Liberia’s Carbon Working Group, co-hosted by Liberia’s Forestry Development Authority and Environmental Protection Agency, includes members of several government institutions such as the Ministry of Lands, Mines and Energy, Ministry of Planning and Econom-

ic Affairs, and the National Investment Commission, as well as several international non-government organizations and lending institutions. This working group is leading the integration of reducing deforestation emissions and carbon financing into this national forest strategy. The group, which also includes several international non-government organizations and lending institutions and the U.S. Forest Service, is collaborating with the government to identify pilot sites for project implementation, build capacity within the Liberian government with respect to carbon financing, and analyze deforestation trends and future land use scenarios. Financing from the sale of carbon credits would be the funding mechanism through which protected areas would be

Climate Benefits The project involves effective management and monitoring of protected areas to reduce emissions from deforestation. The potential protected areas include up to 1.5 million hectares of intact tropical forest, representing an immense reservoir of stored carbon.

Community Benefits Managing the forests of Liberia for carbon storage will provide a sustainable income stream for protected areas management. A new protected area network will create at least 520 jobs. Community conservation agreements will also seek to compensate those living around protected areas for their participation in conservation.

Biological Diversity Benefits Many species in the Guinean forests will benefit from the protection of intact forest habitat, including the threatened pygmy hippopotamus (*Hexaprotodon liberiensis*) and the Liberian mongoose (*Liberiictis kuhni*).

Muriqui Habitat Corridor, Atlantic Forest, Brazil

The Ipanema / Caratinga / Sossego (“Muriqui”) Biodiversity Corridor is an extremely threatened region in the Atlantic Forest of Brazil that harbors two of the most important sanctuaries for the northern muriqui (*Brachyteles hypoxanthus*), the largest primate in the Americas. With an estimated 1,540 individuals remaining, the northern muriqui is highly threatened by habitat loss from deforestation for agriculture that has fragmented the forest cover. To prevent the loss of the northern muriqui and other endemic animal species, forest corridors and protected areas linking the remaining fragments are needed to facilitate animal movement. The project, designed with the support of local non-government organizations, the Minas Gerais Forestry Institute, as well as local

municipalities, will work with farmers within the corridor to reforest degraded riparian zones. These areas, when reforested, will serve as crucial habitat corridors between existing forest fragments. In addition, the forested areas will provide important ecosystem services such as con-

tributing to climate change mitigation through carbon sequestration and protecting important clean water supplies. The project is currently identifying reforestation sites and developing agreements with partners and landowners in order to begin implementation in 2008.



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Climate Benefits The project is undertaking restoration in riparian areas along agricultural land in the Brazilian Atlantic Rainforest. The project will sequester carbon through the immediate reforestation of 180 hectares of degraded agricultural lands, with future expansion to 1,800 hectares.

Community Benefits The project will protect water sources and rivers from erosion, a primary point of concern for local landowners. It also will help landowners comply with Brazilian laws requiring forested riparian areas, and provide project-related employment to improve the livelihoods of rural inhabitants.

Biological Diversity Benefits Numerous threatened native animal species, in addition to the northern muriqui, will benefit from habitat restoration in the Brazilian Atlantic Rainforest. These include bird species such as the vinaceous Amazon parrot (*Amazona vinacea*) and seven-colored tanager (*Tangara fastuosa*), as well as primates such as the buffy-headed marmoset (*Callithrix flaviceps*).

Mamberamo Basin, Indonesia

The Mamberamo Basin is an 8 million-hectare watershed of lower montane, lowland, and swamp forests in Papua, Indonesia, with high value for biodiversity conservation. Increasing pressure to convert the existing forests to palm oil plantations is a major threat to the region, with a 750,000-hectare area currently slated for agricultural and forestry development. Such deforestation would reduce important habitat while increasing the already significant contribu-



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Climate Benefits Over its 30-year life, the project will reduce emissions from deforestation and forest degradation on up to 750,000 hectares of intact forest in the northern part of Papua Province, Indonesia.

Community Benefits The project is exploring how carbon revenues could comprise one component of an integrated development strategy that also would provide employment from modified extractive operations.

Biological Diversity Benefits The old-growth forest in the Mamberamo Basin is a pristine habitat, as researchers recently discovered more than 40 previously unidentified species and “re-discovered” the Berlepsch’s six-wired bird of paradise (*Parotia berlepschi*), first described in 1897.

tion of land conversion in Indonesia to global greenhouse gas emissions. The Mamberamo Basin project seeks to protect the region’s forests and to use carbon financing to ensure their long-term conservation. To evaluate this potential, the Papua Provincial Government, CI and our partners are analyzing patterns and drivers of deforestation, estimating carbon stocks, and

calculating the potential value of carbon credits. By combining this information with socio-economic community data, the project will present alternatives to traditional logging and oil palm development, including reduced deforestation and reduced impact logging practices, to decrease the net carbon emissions while generating employment for local communities.



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Bogotá Conservation Corridor, Colombia

There are three protected areas surrounding the Colombian capital of Bogotá – Sumapaz National Park, Chingaza National Park, and a National Forest Reserve. These protected areas are crucial for the city’s water supply, and also are important reservoirs of native biological diversity in the Andean forests and paramo ecosystems that constitute a

critical link within the North Andean Conservation Corridor. Protecting this important watershed from agricultural encroachment is crucial to ensure both the long-term supply of Bogotá’s water and the rich biological diversity of the area. The partnership formed to address water security and carbon sequestration in the corridor includes agencies

of the Bogotá city and Colombian national governments, the Bogotá municipal water services company, non-government organization partners and CI. The Bogotá Conservation Carbon project seeks to reforest more than 15,000 hectares of degraded land between the existing protected areas with native tree species, while also conserving the existing forests. Connecting the existing protected areas will increase the amount of contiguous natural habitat, sequester atmospheric carbon, and provide clean water to downstream users. The partners are designing an integrated Payment for Environmental Services system that would compensate land owners for forest conservation and restoration activities to sustain the clean water supply and other ecosystem benefits.

Climate Benefits Over its 30-year life, the project will sequester carbon by planting and maintaining native trees on more than 15,000 hectares of previously deforested agricultural areas.

Community Benefits The project will create direct project employment for reforestation, and protect major watersheds for the city of Bogotá.

Biological Diversity Benefits The expanded and improved forest habitat resulting from this project will benefit more than 1,000 plant species, 47 mammals, and 190 birds. Among them are the Andean spectacled bear (*Tremarctos omatus*) and the Andean condor (*Vulture gryphus*).



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Conservation International (CI) applies innovations in science, economics, policy and community participation to protect the Earth's richest regions of plant and animal diversity and demonstrate that human societies can live harmoniously with nature. Founded in 1987, CI works in more than 40 countries on four continents.



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