

**Testimony of Franklin Moore
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Climate Change in Africa

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Good morning, Chairman Payne, Ranking Member Smith, and members of the Subcommittee. Thank you for the opportunity to testify before you today.

Climate change is one of the premier challenges of our generation. No nation, large or small, rich or poor, is immune to its impact, and no nation can afford to sit idly by while its effects unfold. Around the world, climate change is another factor that will exacerbate existing development challenges such as poverty, hunger, disease, and conflict, and may begin to erode the progress we have made toward improving the lives of people in developing countries.

Despite a lack of extensive data in many countries, the effects of climate change have been clearly visible in Africa. Because of Africa's heavy dependence on natural resources and agriculture, and because of limited capacities in many African communities, the repercussions of climate change are particularly ominous. Fluctuations in rainfall and an increase in the frequency and severity of extreme weather events-particularly floods-are projected to put many people at risk in urban areas, while in rural areas, weather events-particularly droughts and increasing temperatures-are projected to significantly hurt crop production. According to the Intergovernmental Panel on Climate Change 2007 report, yields from rain-fed farming may drop in some African countries by as much as 50 percent by 2020, and wheat could disappear from the African continent entirely by 2080. The range and timing of vector-borne diseases, such as malaria and yellow fever, may also shift, which would have serious consequences for public health. Climate change is also expected to exacerbate conflicts over resources, while contributing to increases in local and regional migration that will place further demands on ecosystems, governments, and societies.

The United States is resolute in its commitment to forge a truly global solution to climate change. Through the Copenhagen Accord and a range of international collaborations we are working with the poorest, most vulnerable nations to help them adapt to climate change and chart a future of sustainable growth and development. USAID's climate change programs in Africa focus on three areas-adaptation, energy, and landscapes-while addressing each of the sectors where the effects of climate change will be the most pronounced: food security, health, and social and political stability.

Adaptation

The extent of the effects of climate change depends not only on how much an area will be affected, but also on its ability to adapt to new conditions. To lessen the human and economic costs of climate change, USAID is helping countries reduce risk to changing climatic conditions. The coming years are projected to see an increase in weather extremes and incremental changes, like shifting rainfall patterns, around the world, and

countries and their economies must be able to make informed decisions to increase their capacity to tolerate and withstand those changes.

Africa has the highest proportion of arid, semi-arid, and dry sub-humid lands of any continent; they make up 71 percent of Africa's total land mass. Farmers across the Sahel have had to adapt to climatic variability for decades, and their partnership with USAID has been a model for how we could develop and scale-up adaptation techniques. Over the last 25 years, as land pressure and variability increased, Sahelian farmers adapted by turning to land management that includes forests and trees. Trees are less susceptible to rainfall fluctuations than typical crop systems, and tree products such as fruits, gums, and wood can find ready domestic and export markets. Niger's farmers are managing nearly 5 million hectares of farm forests, which are simultaneously yielding tree products and improving soil productivity for crops. During the aftermath of Niger's 2005 drought and food crisis, one study found that villages that had established farm forests suffered no increase in child mortality, and while unable to produce grains, these villages were still able to sell tree products to purchase food. By adapting to their changing environment, Niger's tree farmers found a way to survive through a drought crisis-which, in the coming years, may unfortunately become less of an anomaly and more of a regular cycle.

In southern Africa, many of USAID's community-based natural resource management programs were initiated as integrated conservation, governance, and economic growth programs. However, at the same time, these programs have been able to increase resiliency by combating land degradation and the threat of desertification.

In arid regions like Namibia, wildlife programs provide greater economic benefits for local communities and are more durable during droughts than other, less suitable land uses, such as crop agriculture and livestock. They also build the resilience and adaptive capacity of the land to respond to changing climatic conditions. With funding from the regional Southern Africa program, one of USAID's most successful conservation programs devolved authority for managing Namibia's dryland natural resources to local conservancies, creating a financial boon for participating communities. Conservancy incomes rose from \$165,000 in 1998 to \$5.7 million in 2008, with returns to the Namibian economy exceeding \$34 million. Community conservancies have overseen dramatic increases not only in local standards of living but also in numbers of important game species. In the meantime, the quality of land has recovered and the land's resilience to climatic variation has increased, while communities have reduced their dependence on livestock and unsustainable agricultural practices that can collapse during droughts. In 2008, the Millennium Challenge Corporation signed a five-year, \$304.5-million compact with the Government of Namibia that is building on the USAID program and includes tourism development, communal land reform, and management of natural products and rangelands.

Niger's tree farmers and Namibia's conservationists are good examples of local approaches to adapt to climate variability, but they do not represent full adaptation strategies. Significant further work will be required to help countries pursue comprehensive adaptation responses that are appropriate to their specific circumstances.

Energy

Although Africa only produces 6 percent of global greenhouse gas emissions, no country has developed without a parallel increased use of energy, which is why developing economies are projected to account for over 80 percent of the growth in emissions by 2030. These countries can and should play a major role in reducing emissions of greenhouse gases in a way that is consistent with robust and sustainable growth. USAID investments to promote low-carbon economic growth are designed to demonstrate and motivate significant reductions in greenhouse gas emissions as land use and energy patterns change with economic development.

To mitigate emissions from energy use and generation, USAID is pursuing activities that encourage clean energy projects, energy efficiency, low-carbon energy development, and energy sector reforms, including capacity building and technical assistance in demand-side management techniques, supporting regional power pools, and the creation of infrastructure networks with a greater ability to distribute output from clean energy facilities. USAID has recently created the Africa Infrastructure Program to support the development of clean energy projects in Africa.

USAID also has active programs to help end extensive gas flaring in the region. In Nigeria, offshore oil platforms flare large amounts of associated gas, a byproduct of crude oil extraction, which causes 36 million tons of carbon dioxide emissions to escape into the atmosphere every year. Capturing and using this gas in the power sector would result in an enormous reduction of existing emissions, and its use would go a long

way toward meeting on-shore energy needs. Over the last decade, the lack of domestic markets or a clear political commitment within Nigeria to end gas flaring resulted in little progress toward that goal. Recently, however, due to increased interest by the Nigerian government, USAID has undertaken a new program of assistance in which it is helping Nigeria to reduce gas flaring through programs that monetize and help to create domestic markets for this associated gas. The goal is to help eliminate gas flaring in Nigeria by advancing the development of a domestic Nigerian natural gas market, attracting outside capital, supporting renewable energy programs, and contributing to the creation of thousands of new jobs. Simply reducing gas flaring could reduce Nigeria's greenhouse gas emissions by 34 million tons a year; in addition, the use of this gas locally using state-of-the-art technology has the potential to displace an additional 30 million tons of carbon dioxide a year by replacing existing, higher polluting sources.

Landscapes

To mitigate emissions caused by land degradation, deforestation, and desertification, USAID is working to change the economic circumstances that drive emissions, improve land management, conserve important carbon "sinks" in forests, promote reforestation and afforestation, and promote improved agricultural and agroforestry methods to increase carbon sequestration. Many of our biodiversity programs also address critical goals for climate change mitigation.

The Central African Regional Program for the Environment (CARPE) is a long-term USAID initiative that has been addressing deforestation and biodiversity loss in the Congo Basin of central Africa since 1995. One of the least developed regions in the world, the Congo Basin is home to a massive expanse of closed-canopy tropical forest, second in area only to the Amazon Basin. Central Africa is the continent's most important carbon sink—an area that stores carbon and mitigating carbon dioxide emissions. However, the unsustainable extraction of natural resources, shifting cultivation practices, poverty, and urban expansion at the forest margin pose increasing threats to this globally significant forest resource.

Maintaining the carbon sink potential of the Congo Basin is a key objective of USAID's climate change program, and the CARPE program is increasingly focused on this goal. CARPE aims to create and execute land-use management plans coupled with a satellite imagery monitoring system to identify ways to limit deforestation and retain the forest as a significant global carbon sink. As a result of these initiatives, 45 million hectares of land—mostly forest—and marine habitats of biological significance are under improved management.

Food Security

Because of its wide-reaching impact on agriculture and landscapes, climate change is inextricably linked to food security. Studies carried out by USAID's Famine Early Warning System Network (FEWS NET) have found that, since the early 1980s, total rainfall in east Africa has seen a sequence like the last five consecutive poor years. Since 1980, total rainfall during east and southern Africa's long rainy seasons has declined an estimated 15 percent. Extreme heat and flooding sparked by climate change will also reduce crop productivity or increase the risk of crop failure.

Ethiopia, one of the most food insecure countries in the world, sits in the cross-hairs of these changing climate patterns, and is struggling to cope with the multiple threats to food security, access to water, and even certain livelihoods. The productivity—and soon, even the basic viability—of its long-cycle crops is at risk. These crops, which provide up to 85 percent of the food grown in Ethiopia, are planted in the same April-May period that has seen 15-percent declines in rainfall. The interaction between drought and declining agricultural capacity could be explosive, dangerous, and costly. Under the most likely scenarios, cereal production in Ethiopia—and, indeed, much of east Africa—may drop 30 percent by 2030, thus requiring equivalent—and unlikely—increases in area used for agriculture or large increases in food aid to make up for the shortfall.

USAID's Regional Enhanced Livelihoods in Pastoral Areas (RELPA) program has sought to counter the effects of declining rainfall in cross-border region of southern Ethiopia, northern Kenya, and southern Somalia. Launched in 2006, the program focuses on pastoralists and agro-pastoralists, whose entire livelihood system was threatened by three consecutive years of failed or insufficient rains. Through this program, USAID has sought to increase the capacity of pastoral communities to adapt to climate variability and cope with its impacts through improvements in land, vegetative cover, and water management, and through provision of alternative, complementary, and enhanced livelihood options such as fodder production, rangeland management, and rehabilitation of water points. RELPA has not only begun to help pastoralists

regain their livelihoods, but it has also focused the attention of the Common Market for East and Southern Africa and other donors to increasing threats to pastoralist livelihoods and food security.

Stability

The increasing scarcity of arable land, water, and food will affect hundreds of millions of people, including, most seriously, the world's poorest. However, while climate change will be one of the factors that can contribute to emerging or reemerging conflicts in the near term, the underlying political, economic, social, and cultural context will remain of ultimate importance. Governments that do not or cannot respond adequately to climate-related challenges will erode the perception of their effectiveness and legitimacy and undermine their own stability, while a steady buildup of environmental problems coupled with ongoing social or economic challenges may trigger instability and population movements. Conflict could stem directly from corrupt, fragile, or failed governments that are unable or unwilling to respond to their people's needs.

Every year, USAID compiles the Alert List, which ranks countries based on their fragility and risk of instability; in 2009, 23 of the 29 most vulnerable countries were in Africa. Conflict analysis must inform all of our programs in Africa, including climate change. And vice versa: the 2010 USAID Alert List will for the first time include research on vulnerability to climate change, as well as conflict.

In addition to our continuing analytical work on the nexus of climate and conflict, in the coming year, USAID plans to develop a pilot project to study vulnerability and resilience in Africa. This project will help us begin to understand local risks and resources related to climate change, and assist us in developing and prioritizing policy interventions. In addition, FEWS NET compiles comprehensive information on how people in food insecure countries live their lives, which can then be used to help us predict any social and economic impacts climate change could bring about. FEWS NET is currently providing its data to an Organization for Economic Cooperation and Development study that is attempting to identify the security impacts that may be seen in the greater Sahel region as a result of climate change. One of the things the study has already taught us is that the accuracy of climate change forecasts is to a great degree contingent on human reactions to forecasts over time. That will mean that one of the primary adaptations humans will have to make is an increased willingness to make the best decisions possible under inherently uncertain conditions.

In addition, USAID's democracy and governance programs that support public awareness, research, public administration, advocacy, and the adoption and enforcement of laws and policies can help countries prepare for and cope with climate change. These existing programs will inform and be informed by USAID's climate change assistance. For example, it will be critical to build on USAID's previous work with civil society groups across the continent, as we look to both raise awareness about the negative effects of climate change and exchange information on adapting to climate impacts.

Health

Health is another area where we are beginning to see climate change take a toll, especially in Africa, where health threats are already chronic and powerful. An increase in the severity and frequency of extreme weather events can not only cause human injury, but also damage water and sanitation systems, which in turn can spark an increase in infectious disease. Changing temperatures could alter the geographic range and vectors of diseases like malaria and yellow fever, and cholera epidemics have been shown to be correlated with higher sea-surface temperatures. Declining food supplies arising from shifting climate patterns or other considerations can lead to adverse health impacts, and even small increases in malnutrition can have multiple health impacts. Meanwhile, weak health infrastructures have very limited capacity to predict, prepare for, or respond to an exacerbation of health risks caused by climate change.

To help begin to address these health impacts, USAID is working with the National Aeronautics and Space Administration (NASA) to support the health-related capabilities of Servir, a NASA-developed monitoring system that established a hub in Nairobi, Kenya, in 2007. Servir integrates satellite and geospatial data to improve our knowledge and observation of weather and climate factors that affect health, including air quality, water quality, and extreme weather. Servir will pilot early warning systems for meningitis, malaria, and locust infestations. As part of our expanding strategy to address climate change, we hope to include more health indicators into monitoring systems like Servir and FEWS NET so that we can better understand, prepare for, and mitigate emerging health threats.

The Way Forward

Many development activities can reduce vulnerability to climate change, but if risks and opportunities are not taken into account, if we forge ahead with "business as usual," then we risk making investments that will fail to meet long-term development objectives or, worse, exacerbate vulnerabilities. For instance, coastal development pursued without consideration to long-term changes in sea level or storm surges can put human lives, infrastructure, and industries at risk.

Adaptation. Adaptation is about building capacity to understand likely climate change impacts and strategically planning investments to increase resilience to shocks felt by communities and economies. Activities can range from integrating knowledge of climate change into activity planning (for example, identifying the crops most vulnerable to climate change in a development program designed to increase food security) to implementing programs that explicitly target climate change issues (increasing availability of predictions and scientific information).

Integrating climate change adaptation into development investments begins with understanding vulnerability, which itself is a product of understanding how the climate is changing and related underlying socioeconomic factors. Understanding vulnerability does not mean that our information about the future is flawless, but rather that we have sufficient knowledge to identify larger trends and consider a range of options to manage risk.

Identifying new adaptive strategies involves a broad-reaching phase during which we examine our development portfolio and our partner countries' priorities, consider indigenous knowledge and existing practices, and build the involvement of stakeholders, communities, and partners. Results of assessment and planning efforts must inform decisions and practices to reduce risks and manage resources sustainably. We must take advantage of opportunities presented by new technologies and targeted research to advance our development efforts. Actions should then be flexible, forward-looking, and diverse, with the ability to accommodate incremental changes as our knowledge improves.

Energy. USAID is pursuing several objectives to help support clean energy and build countries' capacities to participate in future international carbon markets. First, we are assisting developing countries in creating the policies and investment environments for attracting capital that will finance low carbon growth. Second, we are helping improve developing countries' capacities to measure and report greenhouse emissions to provide international transparency and support access to future funding streams.

As we develop and implement low carbon development strategies, USAID investments will support the creation of national economic growth strategies, parallel with reduced greenhouse gas emissions. Integral to the success of these strategies is an open, participatory design process that raises awareness among all sectors of society and that fosters dialogue and shared commitment to the objectives in the strategies.

In addition, through our Africa Infrastructure Program, USAID is actively supporting efforts by African governments to implement low-carbon development strategies by helping to create enabling environments and to finalize clean energy projects currently under development. USAID assists African countries in creating policies, regulations, and legal frameworks that will attract private capital to clean energy investments, and addressing problems and barriers preventing the short-term closure of clean energy projects under development. USAID is currently supporting the development and execution of over 500 MW of wind and renewable energy projects, and we are assessing future assistance to even more wind, water, solar, geothermal, and other clean energy projects in the region.

Landscapes. USAID's landscapes programs will address several priorities, including implementation of national or sub-national strategies to reduce emissions from deforestation and degradation, greenhouse gas inventories and accounting, forest carbon market readiness, and targeted field demonstrations and investments.

To help us prioritize our investments, USAID spearheaded an analysis of the carbon storage potential of landscapes, threats to carbon stocks, and the strength of the enabling environment. Now we are in discussions with countries such as Malawi to develop a land use inventory and accounting system that would allow forestry departments to track improved land management practices and begin to access carbon finance. We are shifting the focus of the CARPE program from implementation to institutionalization, with the goal of phasing out U.S. support by 2016. Building on CARPE's strengths in linking satellite remote sensing data to on-the-ground information about land management practices and improved environmental governance to help monitor, report, and verify increases in carbon storage, we are exploring how to tap into private sector financial support through carbon markets for improved forest management practices. Our goal is to make tropical forest conservation sustainable, reaping the climate change benefits of increased carbon storage as well as improvements in the lives of the 80 million people who depend on these forests.

The greatest potential for carbon uptake is through the conversion of previously degraded lands into well-managed agroforestry systems. Africa has great potential in this area. The Common Market for Eastern and South Africa (COMESA) has been taking a leading role in building local capacity to engage in carbon finance markets and receive international financial flows from increased carbon storage. African countries face serious barriers in entering these markets, including a lack of inventories of land use and emissions, weak financial systems, and slow adoption of improved land management practices. With USAID support, COMESA is seeking ways to reduce these barriers and help African countries invest in improved land management techniques while also tapping into international markets to provide finance to support this work.

The African Union, the New Partnership for Africa's Development, and the Common Market for Eastern and Southern Africa have created a working group on climate, agriculture, forests, land use, and livelihoods. Recognizing that climate change magnifies, intensifies, and speeds up already serious threats to ecosystems and the people who depend on them, the working group seeks to promote and support adaptation, mitigation, and related agricultural, land use and livelihood strategies in East and Southern Africa.

Our key priorities-in adaptation, energy, and landscapes-require a cooperative approach. USAID is supporting regional African organizations, including regional economic commissions, river basin organizations, and regional scientific organizations. We will be helping these organizations build local capacity to engage with international carbon finance markets, build regional power grids, and provide climate data and information. In addition, we are currently in talks with the African Union and other donors to discuss how we can best support climate change efforts on the continent.

Africa is a vital part of the global solution to climate change. We do not need a crystal ball to tell us that we must act quickly and effectively to help the continent prepare for the wide-ranging, long-lasting environmental challenges. Without effective adaptation to climate change, Africa will only see the contributors to hunger, disease, and conflict increase. But if we work together to address climate change across every sector, we can forge a way forward that not only prepares Africa's most vulnerable people to cope with new pressures, but also creates better opportunities, better living conditions, and better lives.

Thank you, Mr. Chairman, Ranking Member Smith, and members of the Subcommittee for your continued support for USAID and our programs.