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CLIMATE CHANGE AND CONFLICT IN AFRICA AND LATIN AMERICA

FINDINGS AND PRELIMINARY LESSONS FROM UGANDA, ETHIOPIA, AND PERU

JULY 2013

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ARCC



African and Latin American
Resilience to Climate Change Project



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AFRICAN AND LATIN AMERICAN RESILIENCE TO CLIMATE CHANGE (ARCC)

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ACRONYMS AND ABBREVIATIONS

ARCC	African and Latin American Resilience to Climate Change
ARMA	Arequipa Regional Environmental Authority
CIESIN	Center for International Earth Science Information Network
CAF	Conflict Assessment Framework
CCAPS	Climate Change and African Political Stability
CCCAF	Climate Change and Conflict Assessment Framework
CMM	Office of Conflict Management and Mitigation
CNAS	Center for a New American Security
CSIS	Center for Strategic and International Studies
DRC	Democratic Republic of the Congo
ENSO	El Niño/Southern Oscillation
EPRDF	Ethiopian Peoples' Revolutionary Democratic Front
ESAF	Environmental Security Assessment Framework
FESS	Foundation for Environmental Security and Sustainability
FEWS NET	Famine Early Warning System Network
GDP	Gross Domestic Product
GIS	Geographic Information System
GOE	Government of Egypt
GTP	Growth and Transformation Plan
HDI	Human Development Index
IPCC	Intergovernmental Panel on Climate Change
MEM	Ministry of Energy and Mines
NGO	Nongovernmental Organization
PRIO	Peace Research Institute Oslo
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UPDF	Uganda People's Defence Force
USAID	United States Agency for International Development

I.0 INTRODUCTION

I.1 RESEARCH AND DEBATES ON CLIMATE CHANGE AND CONFLICT IN THE WAKE OF IPCC4

In 2007, the *Fourth Annual Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)* predicted that rising global temperatures would contribute to a steady upsurge in severe storms, floods, droughts, glacier melt, and sea level rise. Since then, extreme and erratic weather in much of the developing world has provided further support for such projections. Increasingly, recurrent droughts in the Horn of Africa have posed severe threats to food security for millions of people. In Asia, frequent tropical cyclones and heat waves such as the one experienced in New Delhi in the summer of 2012 have strained the response capacities of local and national governments. In Latin America, melting glaciers and changes in seasonal rainfall patterns have altered landscapes and increased competition for scarce water throughout the Andes.

Such climate-related trends and events clearly have the potential to impede or reverse economic development and generate humanitarian crises, but will they contribute to conflict? A wide variety of studies and research initiatives have directly or indirectly addressed this question in recent years, making use of an assortment of analytic approaches often reflective of the institutional perspectives of those asking the question. Many early efforts had the same basic goal of providing early warnings about potentially powerful climate-conflict linkages. In 2007 and 2008, several well-publicized policy reports by security and intelligence analysts concluded that there is a strong likelihood that the natural hazards and environmental stresses associated with climate change will trigger or amplify conflict with alarming consequences, especially in vulnerable or unstable areas of the developing world (CNA Corporation, 2007; Center for Strategic and International Studies [CSIS] and Center for a New American Security [CNAS], 2008; Fingar, 2008). The Center for a New American Security, for example, found:

“...the United States can expect that climate change will exacerbate already existing North-South tensions, dramatically increase global migration both inside and between nations, lead to increasingly serious public health problems, heighten interstate tension and possibly conflict over resources, collapse agricultural markets and global fisheries, challenge the institutions of global governance, cause potentially destabilizing domestic political and social repercussions, and spur unpredictable shifts in the global balance of power” (Campbell and Weitz, 2008).

The CNA Corporation similarly envisioned a confluence of factors that might overwhelm weak or flawed systems of governance and public institutions, setting the stage for conflict. Thus, climate change impacts would:

“...foster political instability where societal demands exceed the capacity of governments to cope.... Economic and environmental conditions in already fragile areas will further erode as food production declines, diseases increase, clean water becomes increasingly scarce and large populations move in search of resources. Weakened and failing governments, with an already thin margin for survival, foster the conditions for internal conflicts, extremism, and movement toward increased authoritarianism and radical ideologies” (CNA Corporation, 2007).

In his testimony to Congress, the Chairman of the National Intelligence Council estimated that by 2030:

“Climate change could threaten domestic stability in some states, potentially contributing to intra- or, less likely, interstate conflict, particularly over access to increasingly scarce water

resources. We judge that economic migrants will perceive additional reasons to migrate because of harsh climates, both within nations and from disadvantaged to richer countries” (Fingar, 2008).

International organizations speculated about the mechanisms or channels by which climate change could affect security and increase the frequency of conflict. A report published by the Secretary-General of the United Nations (UN) emphasized a number of such possible connections, including food insecurity, disease outbreaks, natural disasters, displaced populations, resource competition, and sharp economic reversals (UN, 2009). The German Advisory Council on Global Change identified four main climate-related “conflict constellations” that it saw as likely to emerge: degradation of freshwater resources, declines in food production, increasing storm and flood disasters, and migration (German Advisory Council on Global Change, 2008). Other reports, including one prepared for the World Bank, produced similar lists, while also taking special note of the increased conflict potential posed by the threat of sea level rise (Buhaug et al., 2010; Levy et al., 2008).

Academic specialists also were quick to address the question of whether climate change was likely to contribute to conflict. A team of academic researchers from several major American universities analyzed historical linkages between civil war and temperatures in sub-Saharan Africa. Combining those findings with climate model projections for the future, they found their data suggested “a roughly 54% increase in armed conflict incidence by 2030” (Burke et al., 2009). But some analysts cautioned against unqualified assertions of direct causal linkages between climate change and African conflict. Halvard Buhaug of the Peace Research Institute Oslo (PRIO) countered that the evidence of climate-conflict linkages was unconvincing, and “African civil wars can be explained by generic structural and contextual conditions” related to “political exclusion, poor economic performance, and changes in the international system” (Buhaug, 2010).

Other scholars sought to use empirical data to investigate the historical relationship between large-scale climate variations and global or regional patterns of civil conflict. Three Columbia University researchers examined the El Niño/Southern Oscillation (ENSO) and data on civil conflicts in the tropics from 1950 to 2004 and concluded that the probability of civil conflicts doubled during warmer and drier El Niño years relative to La Niña years. Although they speculated about possible economic explanatory factors, they acknowledged that their findings did not address — much less identify — the actual mechanisms linking conflict to climate shifts (Hsiang et al., 2011).

A group of academics and analysts brought together by the Center for International Earth Science Information Network (CIESIN) at Columbia University examined potential impacts of climate change in relation to high risk countries and U.S. security interests. The CIESIN report gathered together projected impacts of sea level rise, temperature change/adaptive capacity, and water scarcity and combined them with estimates of high-risk factors for instability. While the resulting interrelationships produced several lists of countries potentially facing climate-related vulnerabilities worth noting for U.S. security concerns, the report was careful to observe that its findings did not constitute “formal predictions” of security problems and were more properly thought of as “useful input” for “qualitative analysis of plausible security threats from climate change” (Levy et al., 2008).

At the University of Texas, scholars at the Robert S. Strauss Center combined a variety of indicators and geographic information system (GIS)-based subnational data as part of a sophisticated program of vulnerability mapping under the heading of Climate Change and African Political Stability (CCAPS). Explicitly recognizing the multidimensional nature of vulnerability and wishing to move beyond the constraints of narrowly defined violent conflict, the CCAPS program mapped out “climate insecurity” by combining four baskets of vulnerability: physical exposure to climate-related hazards, population density, household and community resilience, and governance and political violence. While not presuming to predict areas of climate-related conflict, the CCAPS maps provided more finely grained views of where

many well-known precursors to conflict might be found across Africa. Not entirely surprisingly, based on these composite data, the countries identified on the map as most insecure and needful of climate adaptation assistance — Somalia, Southern Sudan, Democratic Republic of Congo, Sierra Leone, and Guinea — also were among those with the most serious governance problems (Busby et al., 2010).

1.2 EARLY WARNING, CORRELATIONS, AND VULNERABILITY MAPPING

Thus, with just a few exceptions, the early discussions and debates about how climate change might (or might not) contribute to conflict have clustered around three main perspectives.² The first perspective was that offered by those who wanted to sound the climate change alarm to alert the security community about what might be the most significant threat to global security for the remainder of the 21st century. Adherents to this outlook put forward arguments based on assertions that were compelling, but unavoidably speculative and empirically weak.

The second perspective sought to place the discussion on firmer empirical ground using large N-data sets to correlate temperatures or other climate phenomena with instances of violent conflict in Africa and other tropical zones. The use of hard data, however, was not accompanied by commensurate explanatory power. Even where researchers' data showed correlations between various climate impacts and the frequency of conflicts, the causal or linking mechanisms between the independent (climate) variables and the dependent (conflict) variables remained missing or unexplained.

The third perspective more clearly recognized that climate change impacts would result in conflict only through complex interactions with other powerful non-climate-related factors such as demography, economic trends, governance, and the existing resilience level of affected countries and communities. This body of work produced geographic projections, and sometimes quite detailed mapping of potential hotspots or highly vulnerable or insecure locations. Much of what emerged from these composite indices and maps, however, did not differ greatly from what might be gleaned from other sources, such as the UN Human Development Index (HDI) or the writing and analyses of regional or country experts.

Despite their important contributions to the general state of knowledge about climate-conflict linkages, none of these three perspectives provided clear guidance or actionable recommendations that might be used by international assistance agencies in responding to emerging concerns about climate change and conflict.³ They fell short in several ways. First, their analyses were based on hypothetical situations, broad typologies, and estimated vulnerabilities that did not identify real situations in real places or specify interactions among key actors and institutions leading to insecurity and conflict in particular countries. Second, statistical correlations of climate impacts with conflict both raised questions about the validity and adequacy of the variables selected and communicated only a general message about the need to “watch out” for increased conflict at indeterminate times and locations in the future. Third, even though multifactor mapping exercises integrated increasingly numerous layers of potentially relevant information, they still were disconnected from input from the people whose perceptions and actions would presumably lead to conflict or cooperation.⁴

1.3 BACKGROUND TO THE CASE STUDIES

Hence, when in 2009 the Office of Conflict Management and Mitigation (CMM) of the U.S. Agency for International Development (USAID) asked the Foundation for Environmental Security and Sustainability (FESS) to review the emerging literature and discussion about climate change and conflict linkages, FESS found that “the analysis and discussion of the climate-conflict relationship to date is very largely conceptual, schematic, and deductive.” FESS noted the need for a more context-specific, actor-based, and participatory approach to the understanding of the climate-conflict relationship in specific countries or regions. Absent contributions from field-based research, the potential existed for broadly conceived

and costly assistance initiatives that might “run ahead of firm evidence” in response to climate-and-conflict fears (Stark et al., 2009).

In that context, USAID/CMM asked FESS to conduct three preliminary country case studies with two main purposes: 1) to help fill the gap in knowledge regarding how climate-related vulnerabilities interact with the dynamics of fragility, instability, and conflict in specific selected locations around the world; and 2) to identify target areas and opportunities for USAID to improve the provision and coordination of programmatic interventions that can address climate change and conflict vulnerabilities in those countries.

The three countries chosen were Uganda, Ethiopia, and Peru. Specific subnational regions were identified in each country as the principal areas of investigation. In Uganda, research was conducted along the so-called “Cattle Corridor,” running from the southwest to the northeast of the country, with a particular concentration on the region of Karamoja. In Ethiopia, field research was conducted in the predominantly pastoral areas of Oromia, Somali, and Afar National Regional States. In Peru, the geographic focus was the Andean mountain highlands, especially the regions of Ancash and Arequipa. Despite very different national contexts and local circumstances, all of these subnational locales experienced some level of conflict and significant climate variability in recent years.

1.4 METHODOLOGY

To help guide the methodological approach to the climate change and conflict case studies, FESS developed a seven-phase framework – the Climate Change and Conflict Assessment Framework (CCCAF). The framework provides a process for considering a wide variety of background data that supply context for analysis of the climate-conflict nexus. It relies in part on FESS’s Environmental Security Assessment Framework (ESAF) methodology, while integrating core components of USAID’s Conflict Assessment Framework (CAF). Both the ESAF and CAF emphasize one of the main conclusions of recent conflict analysis: Conflict is always the result of the interactions of multiple political, economic, social, historical, and cultural factors, and these must be taken into account in any analysis.

The purpose of the CCCAF is to serve as a tool for analysis and to raise relevant, case-specific questions about these variables. While presented sequentially, the seven phases of the CCCAF allow for continual feedback for revisiting and revising preliminary information and findings.

The first phase of the CCCAF reviews conflict-prone areas of the selected country that have experienced extreme climate variability (e.g., droughts, floods, and unseasonal temperature fluctuations). Patterns of conflict within these areas with potential linkages to climate effects are then identified.

Phase 2 seeks to ground the study in the specific context of the country or region under study. Understanding how climate change may be contributing to conflict in any specific country or region first requires substantive knowledge about the relevant national context and areas of contention and conflict. All societies not only are marked by such cleavages, but also possess a range of coping mechanisms or resiliencies that can be employed to reduce the likelihood of conflict. Formal and informal political, economic, and social institutions respond to threats in ways that are more or less successful in resolving or mitigating complaints and real or perceived injustices.

Phase 3 links environmental and socioeconomic factors to ask how climate change may pose threats to essential resources, livelihoods, food security, and cultural values in the areas under study.

The fourth phase of the CCCAF looks more closely at the responses of affected communities and individuals to climate variability, extreme weather events, and their consequences. It asks how social, human, physical, financial, and natural capital and assets are used to build resilience or coping strategies for communities and social groups.

Phase 5 identifies the relevant stakeholders from government, civil society, and affected communities and solicits their perceptions and experiences of the impacts of climate trends and natural hazards. It investigates whether and how these impacts intertwine with citizen grievances, stakeholder interests, mobilizing factors, and the potential for conflict. Stakeholders are asked to describe their own response capacities and those of other stakeholders and to give their perceptions of the political, social, and institutional responses to climate-related challenges.

In Phase 6, based on the synthesis of all of the data and field research, scenarios are developed to illuminate potential futures. These scenarios are not predictions, but ways of envisioning plausible future outcomes and their accompanying levels of potential conflict.

The CCCAF concludes in Phase 7 by bringing together the contextual impacts of environmental and climate change, relevant core grievances and drivers of conflict, patterns of resilience, windows of vulnerability or opportunity (triggers), and projected future climate vulnerabilities to determine the links between climate change and potential conflict. It also highlights links between climate change and adaptive resilience. Phase 7 identifies lessons learned, good practices, programmatic gaps, and target areas and opportunities to improve the provision and coordination of interventions that can address climate change and climate-related conflicts.

I.5 IN THE FIELD

The field research for each of the country case studies was conducted by a team of FESS researchers in collaboration with host country local partners, the relevant USAID Mission, and USAID/CMM. After initial background research, each study devoted two to three weeks of field research in the selected subnational regions, bracketed at beginning and end by meetings and interviews in the respective national capitals. In each case, those consulted represented numerous and diverse groups from national and local governments, civil society organizations, international assistance agencies, multilateral organizations, academia, and the private sector, as well as focus groups in local communities.

Interviews followed a loosely structured format that permitted the natural flow of conversation and discussion of each person's or organization's responsibilities and priorities. Within that format, the following basic questions⁵ were addressed, followed by more in-depth discussion:

- Has the environment changed in recent years?
- What have been the impacts of environmental change?
- What are the causes of these environmental changes and impacts?
- If climate change is a cause, what is the nature of those changes?
- How have local people responded to or tried to cope with climate change? Who is doing what?
- How have local and national government responded?
- Are there conflicts in your community or area of interest or responsibility?
- If so, what is causing them and how serious are they?
- Has environmental change contributed to potential or actual conflict?
- Has climate change contributed to potential or actual conflict? How and why?
- What further responses are necessary to deal with the negative consequences of climate-related environmental change?

- Given current climate-related environmental trends, what is your vision of the future 10 years from now with/without future interventions (in addition to current coping mechanisms)?

It is worth noting that, for the purposes of research on instability and conflict, subjective judgments and personal perceptions can be just as relevant as factual information and empirical data. Individuals are the agents of conflict, and their readings of their personal circumstances form the basis for their actions. For example, it is common to hear disenchanted individuals and groups assert, “the government is doing nothing” to help them with their problems, when it is demonstrably true that is not the case. Yet, their perspective informs their propensity toward conflict, and may even reflect some larger truth. These sorts of considerations are important to keep in mind in assessing the mix of factors that may be contributing to potential conflict.

To orient the discussion that follows and ground it in the findings of the case studies, the next section provides a brief summary of each case study. For each case, the relevant political, economic, and social context is explained, followed by a description of the intertwining effects of climate change and the main observations in relation to climate-related linkages to actual or potential conflict. The full reports, with additional climate and biophysical data, complete citations, and case-specific recommendations, are available at the following sites:

- <http://www.usaid.gov/what-we-do/working-crises-and-conflict/technical-publications>
- www.fess-global.org

2.0 THREE CASE STUDIES: FINDINGS FROM THE FIELD

2.1 UGANDA: PASTORALIST TRANSITIONS AND VIOLENCE IN KARAMOJA

2.1.1 From Political Promise to Lost Legitimacy

Yoweri Museveni became the president of Uganda in 1986 after a quarter century of military coups, ethnic conflict, economic crises, and massive political violence. He set out to stabilize a country desperate for peace and security.

Viewed from the macroeconomic perspective, Uganda has had considerable success under President Museveni. In the late 1980s, he instituted reforms to liberalize the Ugandan economy. GDP growth during the Museveni era has been consistently at or above the six percent annual growth rate necessary to outpace a rapidly growing population. Since the mid-1990s, inflation has been held in check, and poverty levels have decreased. Nevertheless, the demographic composition of population growth — about half the population is now under 15 years of age — means that job creation is a major challenge for the country.

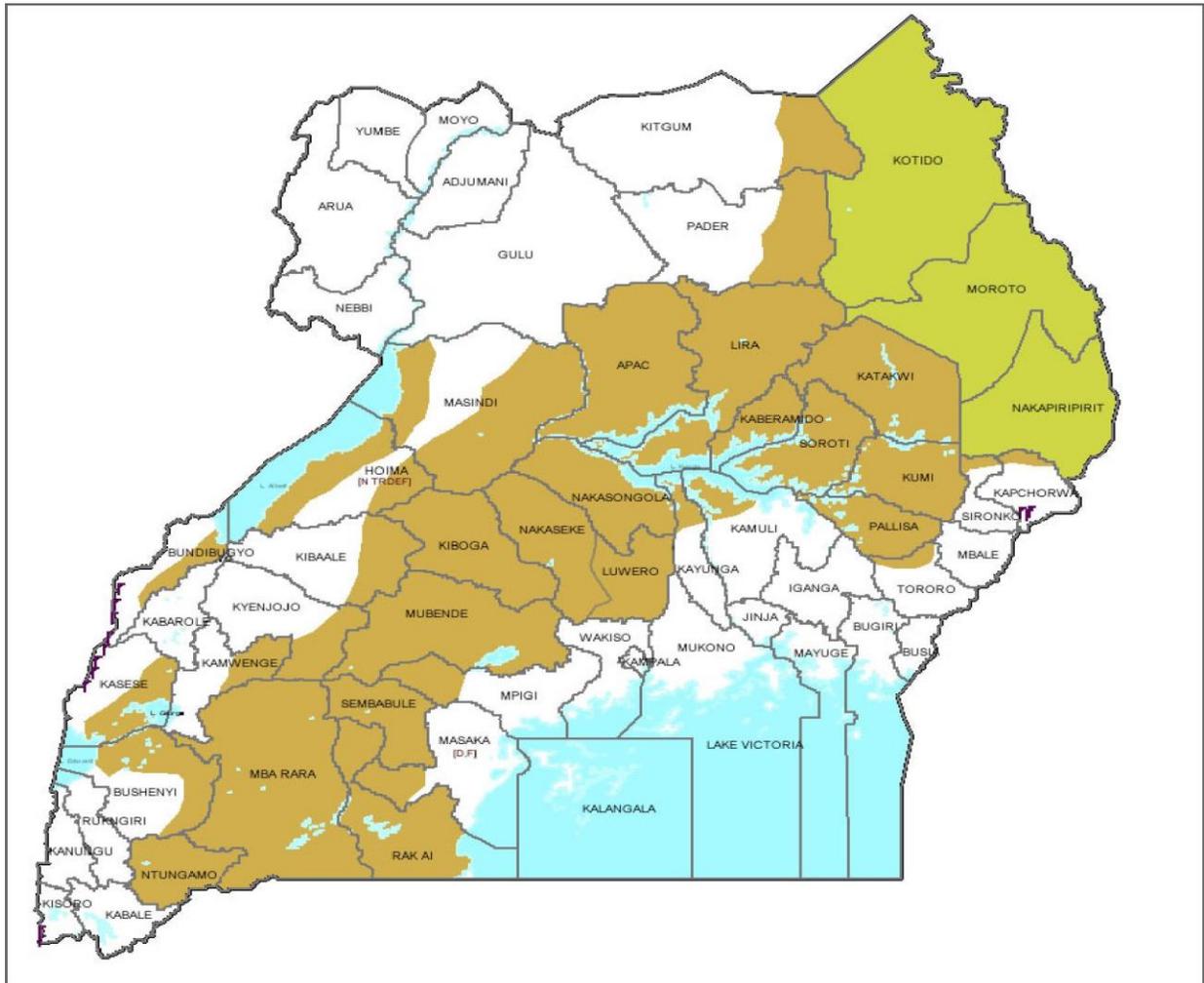
By the mid-1990s, Museveni was receiving international praise as one of a new breed of promising African leaders. Notwithstanding these early assessments, Museveni's reelections in 2001, 2006, and 2011 were marked by often repressive and divisive campaigns that disappointed hopes for increased democratic competition and soured most observers on Museveni's democratic credentials.

In the late 1990s, Uganda became embroiled in the political turmoil and armed conflict of its neighbor, the Democratic Republic of the Congo (DRC). The Uganda People's Defence Force (UPDF) controlled the northeast region of the resource-rich DRC and allegedly became engaged in the illicit extraction of gold, diamonds, timber, coltan, and ivory. A 2010 UN report stated that Ugandan troops engaged in "torture and various other cruel, inhuman, or degrading treatments" while in the DRC.

Domestically, the use and allocation of land, water, and forests also have been tied to allegations of government corruption and political patronage. While Uganda has well-developed environmental laws, they are poorly implemented and enforced.

Thus, while President Museveni's lengthy tenure as Uganda's head of state has provided stability and generally good economic performance, the context for the consideration of conflict — and any role that climate change may play — includes existing ethnic tensions, persistent poverty, flawed electoral competition, mismanagement of natural resources, and poor military command and control.

FIGURE 1: DROUGHT-AFFECTED AREAS OF THE CATTLE CORRIDOR IN UGANDA (WITH KARAMOJA IN GREEN)



Source: Adapted from Barihaihi, 2010.

2.1.2 Pastoralism in Uganda

Pastoralism is a livelihood and set of cultural practices based on cattle herding that uses mobility to make maximum use of scarce natural resources in arid or semi-arid environments with limited and erratic rainfall. In these drought-prone areas, pastoralists move their cattle to water and pasture, based on annual weather cycles and prevailing climatic conditions. Pastoralists are among the poorest Ugandans, with high rates of infant and maternal mortality, low levels of literacy, and limited political participation. Both government and their fellow citizens often hold them in poor regard. Pastoralism is considered by many Ugandans to be a backward or declining livelihood with a limited future and headed toward a more or less inevitable transition to ranching, farming, or other alternative livelihoods. Nevertheless, pastoralists, not ranchers, hold the majority of the national cattle herd and produce the great majority of the country's milk and beef.

Despite its economic contributions and environmental advantages, pastoralism in Uganda is besieged by a series of difficult challenges, involving demographic change, land rights, the apportioning of land for

protected areas and mineral exploration, and landscape conversion and fencing for areas under development. Uganda's rapidly growing population has expanded the land under cultivation, disrupting pastoralists' traditional access to pasture and water and bringing them increasingly into conflict with farmers. Land disputes have overwhelmed the already weak, corrupt, and overburdened court system.

2.1.3 Climate Change and Conflict in Central Uganda

Nearly every person in Luwero, Nakaseke, and Nakasongola districts repeated similar comments when asked if the weather has changed:

"Yes, there are more droughts and the rains are unpredictable."

"We used to plant at the same time every year, late February or early March. Now, we do not know when to plant."

"We have to plant whenever the rain comes. However, sometimes the rain comes, we plant, and then the rain disappears, causing our crops to fail."⁶

Poor weather forecasting and poor natural resource management accompany climate change effects. Weather forecasts are poorly communicated and are viewed with great skepticism by farmers. Farmers and pastoralists alike believe that more frequent droughts are bringing new or worsening infestations of pests and diseases in their crops and in their livestock. These outbreaks are contributing to low livestock and crop productivity.

For most farmers interviewed in Nakasongola, conflicts with cattle keepers are generally low-level affairs. Cattle encroach on crops, and there can be disputes or conflicts at boreholes or valley dams. Often these are settled through negotiations or payments. For pastoralists in northern Nakasongola, however, more serious conflicts and violence ensue when numerous pastoralists bring their cows to a valley dam at the same time.

Few pastoralists or farmers appear to be practicing any sort of climate change adaptation. A few nongovernmental organizations (NGOs) are just beginning to assist farmers in "timely" or "early" land preparation so their gardens will be ready for immediate planting when the rains arrive. Other strategies include drought-resistant and longer-lasting crops, better storage, and kitchen gardens.

Among the factors contributing to local conflict in the Cattle Corridor are public perceptions of arbitrary and corrupt government rulings over land issues. The running thread that unites these disputes is competition over scarce pasture and water scattered over a patchwork of locations that are either shrinking or blocked by new developments and subject to uncertain land tenure.

Climate change is interacting with these factors in ways that multiply the number of conflictive circumstances. The relatively weak capacity of pastoralists in the Cattle Corridor to organize and mobilize for conflict probably represents a limit on the scale of violence. At the local level, however, sporadic episodes of deadly violence remain probable.

2.1.4 Climate Change and Conflict in Karamoja

The situation in Karamoja is far more challenging in terms of culture, livelihoods, security, national policy, climate change, and conflict.

Cattle are highly valued by the Karamojong pastoralists, not only as a means of providing sustenance but also for social and cultural reasons. The Karamojong have long-standing practices of cattle raiding among

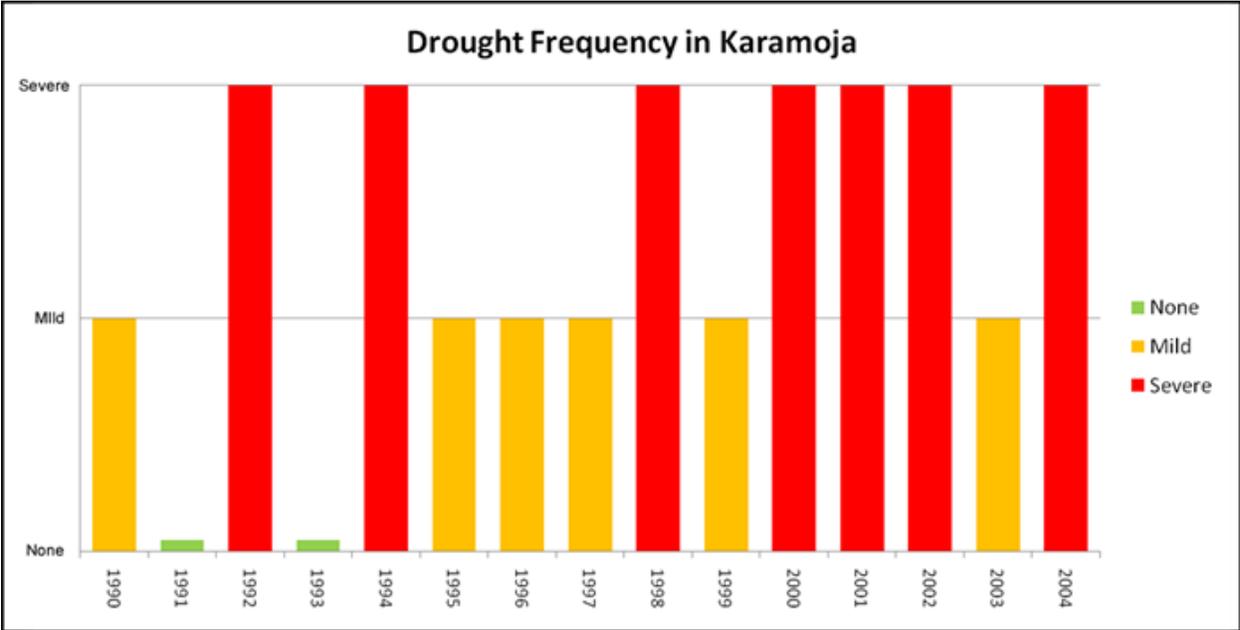
their various tribes and groups. In recent decades, the Karamojong conducted cattle raids not only against their tribal counterparts but also against farming communities in other regions of Uganda. When the Idi Amin government fell in 1979, Ugandan army soldiers abandoned their barracks in Moroto, leaving behind a huge stockpile of 60,000 weapons, which quickly began circulating throughout Karamoja. Other arms came to the region from Sudan and across the border from Kenya.

In response to the violent raiding in Karamoja and its neighboring districts, the Ugandan government launched a series of disarmament campaigns in 1984, 1987, 2001, with an ongoing effort since 2006. The disarmament campaigns began on a voluntary basis, but evolved into forcible disarmament. Disarmament by the UPDF in 2006-2007 through so-called “cordon and search” operations was heavily criticized by human rights groups for including beatings, torture, and killings. As resentments grew, UPDF soldiers increasingly became the targets of Karamojong warriors.

Interwoven with this background of chronic conflict are conditions of deep poverty, rapid population growth, and severe food insecurity. While the percentage of the national population living below the poverty line is 31 percent, in Karamoja it is 82 percent. Local people ranging from 40 years to 70 years of age who were interviewed in Karamoja stated — often using vivid examples — that the climate has changed markedly in recent years. Perennial rivers and streams are now seasonal. Riverbeds that traditionally were reliable dry season sources of water now yield no water. In 2007, when the rains did come, they were torrential downfalls and crops were destroyed.

Severe droughts that used to occur on average approximately every five years are now arriving every two to three years (see Figure 2). It takes an estimated two years to recover from such drought events; the time between droughts has become so short that the asset base of communities has been reduced. Poverty, deprivation, cattle raiding, food insecurity, and social disintegration are now intertwining with the effects of climate change in ways that aggravate tensions and conflict.

FIGURE 2: DROUGHT IN KARAMOJA



Source: Adapted from Famine Early Warning Network System (FEWS NET), 2005.

The Government of Uganda is seeking to improve water availability, increase crop and livestock production, restore degraded natural resources, improve storage facilities, promote markets, and build

the capacities of indigenous stakeholders. However, according to former local officials and Catholic Church leaders, the government suffers from a legacy of severe mistrust.

The Government of Uganda's view of pastoralism as an archaic and outdated livelihood is perceived by many in Karamoja to be a condescending and unrealistic posture that discourages cooperation. Efforts by the government to promote a shift from pastoralism to agriculture, however reasonable as an alternative development strategy over the long term, are just as likely to increase tensions.

Despite new attention by the state to address Karamoja's historical marginalization and the decreasing number and availability of illicit arms, the continuation of cattle raiding, restrictions on movement, persistent abuses by the UPDF, erosion of traditional social roles, and the severe consequences of repeated and increasingly frequent droughts all make efforts to reduce conflict extremely problematic.

2.1.5 Conflict Management and Climate Change in Uganda

In Karamoja, conflict is severe and chronic, with a constellation of contributing factors embedded in a distinctive pastoral culture. With so many contributing factors at play, it might be thought that climate change plays a relatively minor role in conflict in Karamoja. Nevertheless, just as it would be simplistic and wrong to assert that climate change is the major driver of conflict in Karamoja, so too would it be a mistake to fail to recognize that climate change has placed tremendous pressure on the pastoralist livelihoods and food security of the people of Karamoja, thereby increasing the potential for conflict.

The real choice in Karamoja is not between the return of pastoralism as traditionally practiced or a sudden transformation to a predominantly agricultural model about which the Karamojong have had little to say. The key task is to empower Karamojong communities to participate actively in the design and implementation of alternative livelihood, food security, and climate adaptation programs in collaboration with both the Ugandan government and donors. Without their direct involvement and the actual incorporation of some of their ideas, conflict in Karamoja is likely to continue unresolved. As one church leader put it, "Change must come to Karamoja, but it cannot be forced change."

Climate adaptation, in particular, offers the unique possibility of engaging Karamojong participation and building resilience through the explicit incorporation of indigenous knowledge as an important part of coping strategies.

In Uganda, some of the worst-case generalizations and predictions of climate-related conflict appear to be overstated. The good news is that a great deal can be done to mitigate climate change effects through climate adaptation measures (e.g., water harvesting, better crop storage, improved crop selection, and alternative livelihoods), and that many of these are "no-risk" steps addressing development challenges already on the agenda of international assistance agencies. Climate change and the potential for climate-related conflict simply make such actions more urgent and push the cost-benefit analysis of undertaking them toward a more positive balance.

2.2 ETHIOPIA: IS CLIMATE CHANGE PUSHING PASTORALISM TO ITS LIMIT?

2.2.1 The Ethiopian Context

Drought and famine have been powerful factors in shaping governance in Ethiopia over the past 40 years. Drought and famine in 1973-1974 exposed the paralysis and incompetence of Emperor Haile Selassie's aging regime, and contributed to its overthrow by the military regime known as the Derg. Amid continuing violence and the failure of the Derg's economic policies, drought and famine once again struck Ethiopia in 1983-1984, compounding the sense of crisis in the country. The Derg government failed to respond and seemed to be in blatant denial of a humanitarian catastrophe. Only a massive international relief effort brought eventual stability to regions experiencing mass starvation.

The highly centralized Derg regime was overthrown in 1991 and eventually replaced by the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF). To reduce conflict, a process was put into motion to draft and ratify a new constitution based on federalism, multiculturalism, and self-determination. The constitution resulted in the creation of nine ethnically based regional states.

The past decade has been marked by the EPRDF's concentrated focus on economic development, but the formula of federalism through ethnically based regional states has proved controversial, and disputes over the country's local and national elections have raised increasing concerns about political freedom in Ethiopia. The government rejects these concerns as mistaken or misguided.

During the period 2005–2010, Ethiopia experienced rapid economic growth, approaching or surpassing double-digit annual increases in GDP. Approximately 80 percent of the population is still engaged in agriculture, and it remains the key sector for overall economic development. The recently initiated Growth and Transformation Plan (GTP) for 2010–2015 aspires to help Ethiopia reach the level of a middle-income economy by 2020–2023. The GTP's plan for pastoral development gives priority to water development and sets ambitious targets increasing export earnings from live animals and meat exports combined, from US \$125 million in 2010 to US \$1 billion in 2015. The GTP projects "resettlement of pastoralists on a voluntary basis...in areas convenient to irrigation development" (Government of Ethiopia [GOE], 2010).

Pastoralists and agro-pastoralists live in the country's arid and semiarid rangelands of the south and east, and they compose nearly 13 percent of the population. As in Uganda, mobility is fundamental to pastoralists' strategies for coping with unpredictable rainfall, livestock diseases, and the sustainable use of scarce natural resources.

However, pastoralists in Ethiopia also face a number of challenges that threaten the sustainability of their traditional practices. As the country has sought to develop and diversify its economy, land has been allocated by the state for other uses. The combination of diminishing grazing areas and population growth (both human and animal) has contributed to land degradation, competition for pasture and water, and interethnic and intra-ethnic conflict. According to pastoralist leaders, the loss of traditional lands and the constraints on mobility resulting from administrative boundaries have disrupted and disarticulated social coping mechanisms and made traditional means of dispute resolution more difficult. Increasingly recurrent drought, floods, erratic rainfall patterns, and high temperatures are adding significantly to these stresses.

Ethiopia is among those countries most vulnerable to climate risks in Africa. Its high vulnerability derives in large measure from the country's heavy dependence on rain-fed, subsistence agriculture. Average national rainfall has not been decreasing on an annual basis, but the *belg* rains — which fall from March through May, and constitute the main rains for the southern regions of Ethiopia — have seen increasing

variability and extremes. This includes alarming declines in rainfall in recent years; southern Ethiopia experienced severe droughts in 2006, 2008, and 2010-2011. Drought and climate variability are part of the natural cycle in lowland Ethiopia, and pastoralist communities do have an array of traditional coping mechanisms and resiliencies. The increased frequency of extreme weather and droughts, however, threatens to overwhelm these traditional practices.

FIGURE 3: ROUTE TRAVELED AND PRINCIPAL COMMUNITIES VISITED IN ETHIOPIA



Southern Leg: Addis (A) to Yabelo (B), Moyale (C), Wachile/Hudet (D)

Eastern Leg: Addis (A) to Dire Dawa (E), Chiro (F) Mieso (G), Mulu (H), Awash/Amibara (I), Metehara (J)

2.2.2 Pastoralism and Climate Change in Southern Ethiopia

Erratic patterns, fluctuating between late or failed rains and heavy, concentrated downpours are increasingly common in Yabelo in Borana Zone in southern Ethiopia. By the time the rains arrived in April 2011, the resulting shrinkage of pasture and water resources already had pushed local pastoral groups toward crisis, with many people losing all or virtually all of their cattle.

At an SOS Sahel Ethiopia project site outside of Yabelo town, field researchers met with a group of pastoralists (both men and women) to discuss the impact of environmental trends over the past decade on their livestock holdings. These households have experienced a severe reduction in their assets, with an average loss of 80 percent of livestock from their peak holdings over the past 10 years. According to these and other interviewees in Yabelo, the search for water and pasture clearly has become more difficult as extreme weather has reduced their availability, and moving into new areas in search of these resources often provokes conflict. Population growth, tracts of land provided to investors for ranching, and environmental degradation have reduced available land. With the banning of burning in recent years, bush encroachment and the spread of invasive species has also reduced pasture land.

Traditionally, Boran systems of social solidarity and support provided clans with crucial resiliency in relation to the sharing of natural resources, livestock holdings, essential daily needs, and conflict.

Leaders of the community redistributed cattle to those determined to be legitimately in need through no fault of their own. However, these redistributive systems presume that at least some clan members have a surplus that can be shared. Recently, the number of people who can contribute to this system is in decline, while those who seek support are increasing. Some pastoralists have sought to turn to agriculture, but success in dryland agriculture is equally dependent on unreliable rainfall.

Facing food insecurity caused by drought, many pastoralists sell their livestock on the market. Increasing numbers of livestock, often in poor condition, drive down prices. Rich pastoralist entrepreneurs are able to take advantage of this situation. Indeed, pastoralist areas can export increasing numbers of livestock while also seeing increasing levels of destitution. Interviewees expressed mounting concerns about the increasing number of “pastoral dropouts,” who are poorly educated and have few other employment prospects.

Pastoralist communities in the area view drought as their major threat, and water as the key challenge. The Oromia National Regional State government envisions the development of infrastructure and pipelines for an extensive water network, and the government recognizes the potential for competition and conflict among potential water users. But, as one interviewee asked, “For whom will the water network be developed? Pastoralists or investors?” The question of settlements — or “sedentarization” — is a delicate issue, with some fearing that settlements will be created on an involuntary basis. These concerns raise the possibility of increasing tensions as the Borana Zone enters a period of socioeconomic transition contemporaneous with intensifying climate challenges.

The city of Moyale sits uneasily on the borderland between Somali and Oromia regions. Separate district administrative offices represent the traditionally antagonistic interests and claims of Somali and Oromo clans. In interviews, government officials in Moyale said that they view climate change as an obvious and visible reality whose negative impacts they have been experiencing for more than a decade.

These observations were echoed and elaborated in group meetings with both Somali elders and Boran elders. The Somali elders stated that there was no water nearby for animals or humans, the long rains had been reduced to only 15 to 30 days, and temperatures at times become “overwhelming, like a hot iron.” The Boran elders also noted seasonal changes in precipitation and the loss of farming they formerly practiced. In the current drought, they said, “we are not just afraid for our livestock but for our lives – if things continue, we may not survive.” Both Boran and Somali elders conveyed apprehension about the rising number of young pastoralist dropouts who come to Moyale and other towns but find no work there. With different clans in competition for scarce resources, clashes between



Somali Elders Discussing Droughts, Moyale, Ethiopia

Oromo (Borana) and Somali (Garri) clans involve cycles of cattle rustling and theft as they seek to restock or exact revenge for raids and killings. Severe drought temporarily reduces conflict as communities struggle to survive, but seen in the longer perspective, climate change has fundamentally worsened the problems of scarcity and intensified competition.

Both Boran and Somali elders also voiced concerns about what they perceive as the negative effects of the creation of the ethnic-based boundaries of Oromia and Somali regions. For these pastoralists, constraints on mobility to access land based on political claims are a source of strong grievances. The creation of new boreholes or wells in one jurisdiction to the benefit of one clan and the perceived disadvantage to another can easily trigger intense and lethal conflict.

The major new development, about which there was agreement on all sides, was a promising increase in the level of engagement between government officials and clan elders with respect to issues of conflict. In recent years, regional and local authorities of the state have had difficulties in dealing with clan violence and chronic thievery and assaults. In response, they have turned to respected customary institutions and elders for support. The creation of an “elders committee” (or “peace committee”) has been facilitated by the zonal government and has begun to play an important role in dealing with livestock theft and other violations. Boran and Somali elders also are trying to help nip rumors in the bud that fuel conflict. Elders are working to change attitudes among pastoralists and sensitize communities with hopes of eroding the pattern of eye-for-an-eye responses.

The area around the towns of Wachile and Hudet — the former an Oromo community in Borena Zone in Oromia, the latter a Garri (Somali) community in Liben Zone in the Somali Region — has experienced a decade of violence between the Borana and Garri clans.

The field study team met in Wachile with a group of women, who described themselves as “pure pastoralists.” Their situation was dire. They said that they had gone through three years of recurrent drought and their assets and food supplies were nearly exhausted. Their livestock had either perished or were sick and dying. The women — two of whom were widows as a result of past violence — stated that there was no conflict at the moment because of the drought.



Women’s Group Discussing Pastoral Conflict, Wachile, Ethiopia

The women in the group said they regretted their past encouragement of fighting and, from the bitter experience of previous conflicts, had learned that the costs of fighting were too high. One woman said, “A war like that can kill your husband and your child.”

As in Moyale, the emergence of a joint peace committee and changes in community attitudes appeared to provide a window of opportunity for institutional change in support of conflict prevention and mitigation. Given the respective roles of elders, youth, and women in approving, participating in, and encouraging or discouraging raiding, there appeared to be the potential for improved resource sharing and conflict prevention if the government and donors sustained and enhanced the various new forms of dialogue underway.

The impact of drought also was extremely serious in the Somali community of Hudet. According to a group of elders and government officials, including the deputy woreda administrator, the accumulating toll of recurrent drought (“less rain every year” and “no grass or water last year”) had decimated livestock holdings.

The deputy administrator said that given increased drought frequency associated with climate change, government efforts were now directed toward beginning to find alternatives to pastoralism, with an emphasis on agriculture. Once again, the availability of water was identified as the prerequisite for success. As in Wachile, the discussion group in Hudet noted that efforts had been made to create a greater emphasis on interethnic dialogue, but interviewees noted that this process was still in its early stages.

2.2.3 Climate Change, Invasive Species, and Conflict Resolution in Northeastern Oromia and Afar

In areas of Northeastern Oromia, the scarcity of pasture and water resulting from recurrent drought has been causing unprecedented resource competition, driving theft, looting, and raiding involving Issa, Afar, Oromo, and Hawiya clans. Recently, federal, regional, and zonal government officials — frustrated with the difficulty in containing this proliferating conflict — have begun to engage with clan leaders to explore the use of customary laws to restore inter-clan peace in those instances where formal state institutions fall short. According to a high-level security official, a draft accord to reduce conflict, including understandings about water use, was being offered by clan leaders for feedback in their respective communities.

Elders from both the Issa and Hawiya clans expressed strong concerns about climate variability and its impact on local communities. The Hawiya believe that with decreasing rainfall, the water table has fallen, and lowlands have become hotter. The Issa elders observed that rainfall has changed in both quantity and distribution, occurring only in small pockets that have not reached traditional grazing areas. Several of the elders said they had lost all their livestock except for two or three camels.

Here, as elsewhere, it was stated by interviewees that a “peace-building” committee has been formed for dialogue with government and among the communities. The head of the local woreda administration stated that livelihood diversification through the promotion of agro-pastoralism was one main pathway forward to alleviate tensions. This would represent a significant change for the Issa, in particular, but the Issa elders said they were open to this possibility.

Moving into Afar Region, climate-conflict linkages followed a more circuitous route to resource scarcity through the harmful effects of a devastating invasive species – *Prosopis juliflora*. *Prosopis* is highly adaptive with deep roots that produce a strong tolerance for drought and marginal soils. Under conditions of severe drought such as those experienced in recent years, *Prosopis* displaces indigenous vegetation according to representatives from Farm Africa and local researchers.⁷

The Afar Region is made up of mostly very hot and arid lowlands that are chronically drought-prone. For hundreds of years, the Afar pastoralists have been in conflict over pasture and water with the Issa. With some land already lost to commercial farms, the *Prosopis* invasion has drastically impacted the availability of pasture in Afar. Meanwhile, the Issa have continued to push into Afar, closer and closer to the waters of the Awash River. Complicating matters even further, there are serious boundary disputes between the Issa and Afar. The confluence of these stresses — repeated weather shocks, massive *Prosopis* invasion, the loss of pasture to irrigated farmland on state-supported commercial enterprises, the disputed border, and the forays of the Issa onto Afar lands — has raised tensions and the potential for escalating conflict very high.

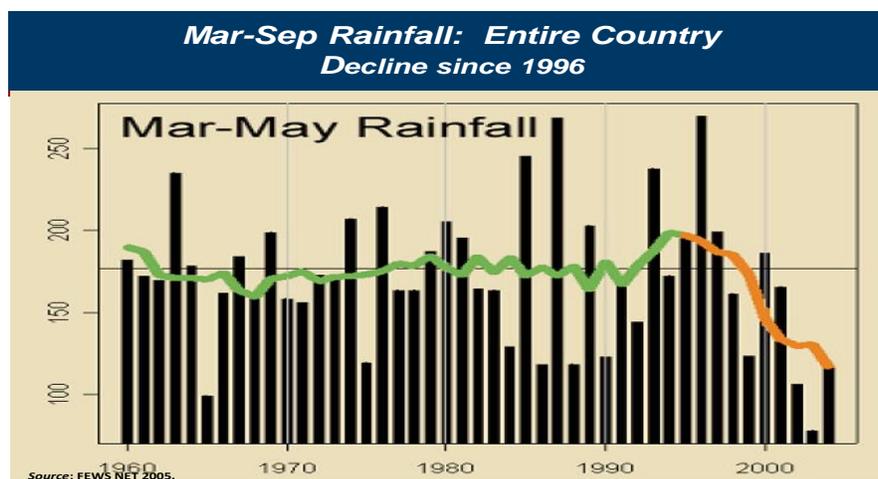
Only the recent emergence of peace (or “salaam”) committees and the efforts of NGOs to combat the *Prosopis* invasion stand out as forms of social and institutional resilience in the face of these mounting problems and antagonisms.

2.2.4 Whither Pastoralism and Pastoralists?

Pastoralists in Ethiopia are coming under increasing pressure. Population growth, increasing numbers of livestock produced for export, deforestation, environmental degradation, bush encroachment, and invasive species are increasing stresses and competition over a shared and shrinking resource base. In some areas, administrative boundaries at times contested or were not clearly demarcate, constrained the movements of pastoralists in search of water and pasture, or may have been used to exclude one pastoralist group to the advantage of another.

Climate trends in pastoralist areas over the last decade indicate that climate change may be bringing a “new normal” that adds unprecedented challenges. The two most important features of climate change impacts are 1) increased frequency of severe droughts, and 2) the chronic failure (late arrival, early cessation, or non-appearance) of the long rains in the period from March through May. The latter trend is reflected in Figure 4.

FIGURE 4: RECENT DECLINES IN MARCH-MAY RAINFALL IN ETHIOPIA



These transformed climate trends bring with them severe weather events whose effects may well overwhelm political and social institutions, especially as they intertwine with other demographic, environmental, and developmental problems. Resource scarcity puts into motion the adaptive strategies that pastoralists have developed over many generations. The most important adaptive strategy remains the mobility of pastoralists. However, the combination of more people with more animals competing for

the use of ever-shrinking pastures and water sources produces conflict. When administrative boundaries are used to try to regulate these movements, resulting in actual or perceived differential benefits for different clans, strong and potentially explosive grievances are likely to arise.

Severe drought now seems to be occurring persistently. In many instances, especially in southern Ethiopia, with no time to recover from year to year, household assets are collapsing. Throughout southern Ethiopia, pastoralists themselves expressed doubts about the viability and future of the pastoralist livelihood.

One consequence of this new pattern is an increase in the number of pastoral dropouts who have few or no alternative economic activities to pursue in the near term. This raises the possibility of a growing and potentially aggrieved population that might gravitate toward urban areas and contribute to climate-related conflict of a quite different sort than the resource competition normally envisioned. It also suggests that the need for alternative livelihoods and urban planning is more urgent than has been recognized to date.

All other things being equal, pastoralism is perhaps the most efficient land use system for Ethiopia's extensive dry rangelands. However, with intensifying climate change and an approach toward pastoralism in the government's development plans that privileges transition toward settlements rather than continuity in support of traditional mobility, it is clear that not all things are equal. Instead, pastoralism is likely to come under increasing climatic and developmental pressures.

Current trends suggest that the need to address the impacts of these constraints and their effects is even more urgent than has been realized to date. There is a danger of international assistance programming falling behind the real curve of the pastoralist transition that is underway.

Nascent dialogues need additional support and offer the opportunity for the development of new forms of institutional cooperation between governments at all levels and customary institutions put in the service of the peaceful sharing of natural resources valued by pastoralist communities. Support for government-community engagement around the theme of climate change and the peaceful sharing of natural resources could both advance progress on resolving resource conflicts and build important new institutional relationships of significant value in their own right.

2.3 PERU: CLIMATE CHANGE, WATER MANAGEMENT, AND RESOURCE CONFLICTS

2.3.1 The Peruvian Context

Peru's geography can be roughly divided into three zones: the arid plains of the Pacific coast, the mountainous highlands or *sierra* of the Andes, and the tropical jungle or *selva* of the Amazon Basin. These three regions are home to culturally and ethnically different majority identity groups, each with very different ecological endowments. The Andean highlands are populated by Amerindian-mestizo descendants with deep roots in Amerindian cultural practices and traditional forms of social solidarity. The Amazonian Basin is much more sparsely populated, with inhabitants who largely self-identify as indigenous people. These Amazonian groups, to an even greater extent than their Andean compatriots, traditionally hold views on ownership, resource access, labor, and political power that are a far cry from the perspectives of the urbanized, westernized, and globalized inhabitants of the coast.

These fractures of ethnicity, identity, economic power, and culture have made state-building extremely difficult in Peru. The weakness of the political system and its inability to give effective voice and representation to the nation's diverse population has led to correspondingly weak government institutions. In the 1980s, Peru was swept up in the Latin American debt crisis, and the nation's economy plummeted. The 1980s and early 1990s also saw an upsurge in illicit coca production and political violence. At the same time, the rise of an extremely violent revolutionary movement, *Sendero Luminoso* (Shining Path), was a serious and direct challenge to the state.

It was in this deeply troubled national context that Alberto Fujimori was able to ascend to the presidency in 1990. Fujimori dissolved congress and suspended the constitution in a so-called "self-coup" in 1992. He implemented an extensive privatization program that reversed statist economic structures but also facilitated cronyism and corruption. Between 1990 and 1997, mining investment increased 20-fold. In 1992, Abimael Guzmán, the leader of Shining Path, was captured in a dramatic blow to the extremists. However, it became increasingly clear that, under Fujimori's direction, military and intelligence personnel had engaged in widespread human rights abuses and killings. Fujimori was eventually convicted and imprisoned for human rights abuses, embezzlement, wiretapping, and bribery. The 1980s had ended in hyperinflation; the 1990s ended in political and institutional disarray.

The promotion of foreign investment in the extractives sector was intensified under President Alan García (2006-2011). Economic growth accelerated, and investment increased in the extractives sector (spurred by high international mineral prices, which played an important role in that growth). Yet complaints about the environmental costs of poorly regulated mining activities proliferated, and there was little evidence that mining brought lasting benefits to affected communities. Community-company relationships were frequently tense and sometimes explosive. Mining communities suffered damages to both the supply and the quality of their water resources.

In 2009, a confrontation in Bagua province in the Amazon over oil and gas exploration dramatized conflict in the extractives sector. Both civilians and police died in the resulting clash, and there were divergent accounts of the incident, including who was at fault. Hence, Peru faced a paradox. As rapid growth began to move the country forward, the most dynamic economic sector was also the greatest generator of conflict.

García's successor, President Ollanta Humala, a former army officer, campaigned on a platform of greater social inclusion for Andean and Amazonian groups, as well as a more equitable distribution of the revenues generated by the extraction of the nation's mineral resources. The country's existing

institutional structures and capacities, however, remained inadequate to the task of addressing many of these conflicts.

High levels of social and economic inequality still create a strong sense of deprivation among vulnerable groups in the countryside. These economic, social, and political rifts are deepened or ameliorated by other factors that condition specific conflictive situations. Given Peru's heavy dependence on its natural resource base for its well-being and stability, climate change is a major conditioning factor, and its effects, which already can be seen and felt, are increasingly consequential.

2.3.2 Climate Change and Human Security

Peru is highly vulnerable to climate change impacts, with seven of the nine vulnerability characteristics recognized in the 1992 United Nations Framework Convention on Climate Change (UNFCCC): low coastal zones; arid and semi-arid areas; exposure to floods, droughts, and desertification; zones prone to natural disasters; areas of high urban pollution; fragile mountain ecosystems; and significant economic dependence on the production and export of fossil fuels. Few countries are as ecologically diverse as Peru, both in terms of biodiversity and distinct climatic zones, and Peru holds 71 percent of the world's tropical highland glaciers.

Extreme weather events and related phenomena have been increasing in frequency, intensity, and duration, sometimes occurring at unusual times of the year. These include flash floods, landslides, droughts, freezes, and hailstorms. In the 1990s, when measured in terms of extreme climate events and mortality, Peru ranked among the 10 most vulnerable countries in the world.

Peruvian glaciers have diminished in size by 22 percent since 1980. Some 95 percent of Peru's population uses water resources that originate in the high Andean regions. Along the Pacific coast, about 80 percent of total water resources are used for irrigated export agriculture. The mining sector also is a significant consumer of water. In the poor, rural highland agricultural sector, irrigation is based on low technology, and water availability for irrigation is often limited.

The interests of these myriad water users are diverse and frequently contradictory. Water management in the agricultural sector raises complex questions about irrigation rights, appropriate technology, and upstream-downstream distributions. Public concerns about mining companies' privileged water access and water pollution caused by mining operations can lead to protests that disrupt or even shut down mining projects. Under Peru's 2009 Water Resources Law, the availability of water for human consumption is considered a human right. As climate-related threats to adequate water supplies increase, the potential for conflict among stakeholders with competing needs and divergent interests is increasing.

The most authoritative tracking of social conflicts in Peru is done by the *Defensoría del Pueblo* or Ombudsman's office in Lima. According to the Ombudsman, more than half of the conflicts in the country are classified as socio-environmental conflicts. Most of these are water conflicts, and a majority is related to conflicts involving extractive industries. The Ombudsman's office is investigating climate change in the context of human rights, focusing on water availability, water quality, and access.

Conflicts between communities and extractive industry companies are at a high level in Peru, and they are likely to increase in number. The Ministry of Energy and Mines (MEM) estimates that the value of mining project investments expected in the next decade is in the range of \$40 billion to \$50 billion. With high metal prices, large mining companies are moving to locations with higher populations and more complex and more easily mobilized communities. The impacts of climate change on water scarcity and water quality have significant implications for both potential conflict and the stability and overall investment climate of the mining sector.

frustration for the growing number of local advocates urgently recommending measures to reverse water insecurity and address conflicts in the Santa River Basin.

Little attention has been given to the problem of climate change and water quality, but it is a looming issue, and one with potentially serious implications for conflict in Ancash. As the glaciers recede, water and oxygen combine with sulfur in the newly exposed surfaces to make sulfuric acid. The sulfuric acid releases the toxic heavy metals found in the exposed rocks, and they are then carried by glacier melt into surface and ground waters. In addition to its harmful effects on human health, contaminated water is potentially a huge problem for irrigated agriculture. However, toxic heavy metals also are produced by mining activities throughout the region. In addition to the very real consequences of poor water quality in the area, the uncertainties about the source of any specific instance of contaminated water could lead to finger pointing and serious conflicts. In the judgment of local experts, the issue of water quality is “a time bomb.”

Conversely, concerns about melting glaciers and water scarcity appear to be somewhat exaggerated or misplaced. Recent research suggests that once the glaciers melt completely, the effects on total water discharge will be variable, differing widely depending on location (Baraer et al., 2012). Researchers and government officials in Ancash agree that problems of water scarcity are less related to absolute shortages than poor management of water supplies, especially in agriculture. Existing water rights are inefficient and inequitable, and those who benefit are resistant to change. High basin areas are the source of water while the lower basin agricultural areas are both the largest consumers of water for irrigation and home to the main centers of administrative and political influence. Yet, highland water conservation is the essential challenge that must be addressed if sustainable water supplies are to be maintained for water users downstream.

The current dysfunctional management of water is a reflection of the fact that the politics and cultural underpinnings of water governance in Peru are thorny and complex. Regional water governance policy reforms and project initiatives need to be crafted and implemented with extreme sensitivity and an acute awareness of how they may affect social, political, and economic interests and unintentionally generate conflict.

Many regional water experts regard integrated water basin management, starting with micro-basins and moving to sub-basins and macro-basins, as the crucial mechanism for achieving sound water management and conflict prevention.

Because of its naturally arid climate, climate change challenges are perhaps even more daunting in Arequipa Region. Cutting across Arequipa Region is the Ocoña River Basin, whose waters originate in the snow and ice cover of Coropuna, a snowcapped mountain that has been greatly reduced in size by the effects of global warming. Desertification has advanced in some parts of the region, while the highlands have seen a reduction in wetlands, springs, and lakes, as well as an increase in extreme weather events that have led to landslides, floods, and crop losses.

In an open meeting in Chuquibamba in Condesuyos Province, a discussion of climate change produced an outpouring of worries, complaints, and laments concerning changes in the area’s weather, landscapes, and livelihoods. Participants agreed that there are many consequences of recent changes in the climate for plants, animals, and humans. In the highlands, pastures no longer grow as they once did, and the milk production of camelids (llamas, alpacas, vicuñas) and cattle (goats, bovines) is declining. Skin cancer is on the rise. Increasing population and the search for firewood for sale has contributed to deforestation. This has resulted in erosion and further loss of water resources. The water for irrigation is decreasing due to these climatic and environmental transformations, and scarcity is producing localized conflicts among water users.

As in Ancash, water scarcity is greatly aggravated by poor water management that is inefficient and often contentious. Small farmers who benefited from the land reforms of the 1970s did not receive water rights in sufficient quantity to meet their irrigation needs. As a consequence, the rights to use water for irrigation are still disproportionately concentrated in a few hands.

Water conflicts are not limited to the level of individuals or competing economic interests, however. There are also cross-border conflicts with neighboring regions. One such recent conflict was the “war over water” on the border between Arequipa and Moquegua, the region that lies to its south. A second regional violent conflict has taken place between Arequipa and Cuzco over the use of water for irrigation projects.

Regional institutions such as Arequipa’s Regional Environmental Authority (ARMA) and the regional Ombudsman’s office are trying to develop their capacities to prevent and manage water conflicts, and they recognize that climate change is an increasingly important contributing factor. However, they are significantly constrained by limited human and financial resources.

At the same time, there are clear opportunities to build on resilient community attitudes that reflect a readiness to work together on common problems. In Condesuyos, for example, community representatives agreed to form committees to address water, environmental, and climate challenges in three issue-areas: reforestation; improved irrigation; and environmental education. Communities and municipalities generally have strong capacity for self-organization but lack resources and technical expertise.

2.3.4 The Trajectory of Climate Change and Conflict in Peru

While weather station data are generally lacking, there is strong agreement among experts, extensive oral testimony, and convincing biophysical evidence that highland areas of Peru are experiencing serious negative impacts from climate change that go well beyond the highly publicized risks of glacier melt. While there is significant variation among specific micro-climates and micro-watersheds, the general effects include continuing glacier retreat, warmer temperatures, more erratic and intense weather events (e.g., droughts, rains, frosts), significant changes in seasonal precipitation patterns, deteriorating highland ecosystems, increasing water scarcity, water contamination (e.g., acid rock drainage), and more frequent natural hazards (e.g., floods, landslides, and glacier lake outbursts). These long-term climate trends are unlikely to go away. In the near term, they are likely to be exacerbated by poor environmental governance.

These stresses and hardships add significantly to conflict potential all along the watersheds that extend from the highland paramos (alpine tundra ecosystems above the timberline) to the middle basin small producers and on to the coastal agro-export plantations dependent on abundant irrigation.

Climate change is not yet the dominant reason for water scarcity (inefficiency in water use in the agricultural sector is the leading factor), but it is a contributor, and it is likely to steadily increase in importance in the coming years if water resource management is not improved. The continuing expansion of the mining sector will also add to water stresses.

At present, the clear trend is toward increasing conflict linked to the accumulating effects of climate change coupled with weak environmental governance. The increasing water requirements of export agriculture and mining are at loggerheads with the reality of climate change trends. Some highland communities are headed toward ecological and economic crisis. Mining companies are encroaching upon fragile ecosystems that are essential for the regulation of the natural water regime. In this context, a proliferation of local social explosions, whose cumulative effects could have ramifications for national stability, is entirely possible.

The new institutional arrangements in Peru's national, regional, and local governments are steps in the right direction, but they will require time, course corrections, and much better institutional coordination before they become fully effective. In the meantime, support for improved and participatory water management is both an important form of climate adaptation and a useful step toward reducing conflict.

There is also considerable capacity in Andean communities for self-organization to take further steps not only to increase resilience but also to institutionalize mechanisms to reduce conflicts, climate-related and otherwise. In fact, joining the agendas of strengthening resilience and promoting conflict prevention would strengthen both outcomes.

3.0 LESSONS LEARNED: PATTERNS OF CHANGE AND INSTITUTIONS

3.1 FROM CAUSATION TO CONSEQUENCES

Given the projected effects of climate change, it was natural and perhaps inevitable that think tanks, researchers, and policy experts would ask, “Will climate change cause conflict in the developing world?”

As the complexities and nuances of these three field-based case studies demonstrate, however, when posed in its simplest form, this is actually not a very helpful or productive question. Is climate change the cause of conflict in the selected regions of Uganda, Ethiopia, and Peru? Clearly, with so many factors contributing to conflict in each of these locales, answering with a flat “yes” would provide an inaccurate and flawed analysis. Conversely, answering the question with a flat “no” — a tendency observable in many recent discussions that seek to debunk the early hype of some climate-conflict warnings — is a dead end that closes off any deeper understanding of climate-conflict linkages.

Instead, based on our case studies, what we *can* say is that trying to understand conflict dynamics in Karamoja; the Oromia, Somali, and Afar regions; and the Peruvian Andes *without* taking into account the effects of climate change, would also produce an incomplete and flawed analysis. Clearly, the case studies of Uganda, Ethiopia, and Peru give confirm our initial methodological premise that “conflict is always the result of the interactions of multiple political, economic, social, historical, and cultural factors.” Yet what they also show is that climate change — especially as reflected in changes in seasonality and severe, erratic weather — has an appreciable impact on politics and political institutions, livelihoods and economic development, society and culture, and even history, insofar as it reconfigures communities’ long-held understanding of their lived environments. In this sense, how could climate change *not* have an impact on conflict?

The results of the case studies argue for setting aside simplistic and non-productive questions of causality and replacing them with more pragmatic and productive questions about how climate change may be *consequential* for conflict, making use of some of the well-established categories of conflict analysis. This facilitates the construction of a more substantive, qualitative analysis that goes beyond general references to climate change as a threat multiplier, stressor, or potential trigger for conflict. It also generates discussion of specific issue areas with linkages to programmatic interventions that USAID or other international assistance agencies may wish to undertake or may already have underway. Equally important, because they incorporate the input of the agents who actually decide whether to take part in or refrain from conflict (i.e., the affected individuals, communities, institutions) the case studies identify the specific stakeholders in government and society whose interests are threatened by climate change and whose participation may be key to the success or failure of climate-related program initiatives.

Recognizing that these three case studies provide only a still-limited comparative base — most notably because all three focus on inland regions in the countryside — it is still possible to identify, on a somewhat stylized and preliminary basis, three climate-related patterns of change and one set of institutional challenges that are likely to be relevant and consequential for rural areas of other developing countries in Africa and Latin America.

3.1.1 Patterns of Change

1. Climate Change as Disruption of Traditional Knowledge and Coping Mechanisms

Climate change effects have been significantly destabilizing for millions of people living in the regions of the three countries covered by the case studies. One of the major sources of insecurity has been the decreasing salience and viability of traditional knowledge and coping mechanisms. For all of the affected groups, whether pastoralists or agriculturalists, day-to-day activities to meet basic needs are grounded in sophisticated, centuries-old knowledge of the flora, fauna, and annual patterns of their environment. All of these societies, especially in Karamoja and the pastoralist areas of Ethiopia, have long-established coping mechanisms to respond to the challenges of (sometimes extreme) climate variability. These episodes of climate variability have nevertheless occurred within certain parameters and a horizon of expectations that allow for a measure of predictability. In today's Uganda, Ethiopia, and Peru, however, rural inhabitants comment frequently on the increasingly erratic nature and sheer *unpredictability* of weather events and weather patterns.

The key dimension of erratic weather patterns for such groups so heavily dependent on the land and natural resource base for daily subsistence is marked *shifts in seasonality*. In both Uganda and Ethiopia in recent years, the planting season rains have shifted toward a later arrival (or non-arrival), and the onset of rains has not meant a sustained period of precipitation. Rather, rains often arrive in intense outbursts, followed by the return of a period of drought. In the Andes, a Quechua expression, *chirimanta ruphaymanta*, is used by *campesinos* to capture the phenomenon of unprecedented extremes of heat and cold. This unpredictability can disrupt long-standing practices in ways that may be counterproductive. For example, one farmer in the Cattle Corridor of Uganda observed that she is only planting on one-fourth of her land because she fears squandering seeds.

A further problem that has exceeded traditional coping mechanisms is the problem of invasive species, especially *Prosopis juliflora*, which thrives in harsh climate conditions and dominates indigenous vegetative cover. Vast areas of grazing land in Afar can no longer be used because of the *Prosopis* invasion, thereby aggravating resentments over encroachments on the remaining viable land by the Issa.

Experience tells us that one thread of the fabric of conflict is often woven of an already aggrieved group's further loss of the sense of control over its own destiny. The erosion of the efficacy of indigenous knowledge brought about by climate change is producing this effect in the communities of the case studies. This was best summed up by one Karamojong interviewee, who said, "If knowledge is power, then the Karamojong feel they are losing the power of their indigenous knowledge as the climate changes. It is one more aspect of their feeling of powerlessness."

2. Climate Change Threats to Livelihoods in the Context of Rapid Economic Development

In southern Ethiopia and Karamoja, the stepped-up pace of recurrent droughts and the loss of traditional sources of pasture and water represent an existential threat to the livelihoods in communities completely or predominantly reliant on pastoralism. Particularly in Ethiopia's Oromia and Somali National regions, the near disappearance of a recovery period between severe droughts has meant a steady depletion of the asset base of households and communities. Formerly practiced traditions of sharing resources during times of scarcity — at times even including among the antagonists of competing clans — are not feasible in the context of a severely reduced asset base.

The case studies suggest that the consequences of climate-related resource scarcity include but are considerably more varied and complex than the conventional imagery of competing interests fighting over a shrinking pie. In pastoralist areas of Ethiopia, interviews made clear that under conditions of severe drought communities were fully occupied with the need to survive and had no inclination or capacity to engage in conflict. Interviewees stated that traditional cattle raiding and restocking would

occur only at some indeterminate point in the future when “the rains have returned and communities have recovered.” The situation in Karamoja was somewhat different. There, armed young Karamojong shifted from traditional cattle raiding to participate in gangs involved in violent thievery and banditry in and around the growing number of small towns. In Ethiopia, the questionable future of pastoralism appeared to be leading many young people to become “pastoral dropouts” drifting into more urban areas. The fate and implications for social stability of this rapidly growing, unskilled cohort of youths remains an important question which seriously concerns local development specialists.

In the very different circumstances of Peru, fears about the sustainability of livelihoods were less acute but also present. As in Africa, a variety of factors conjoined to produce these worries, but water scarcity related to climate change was a tangible threat cited in interviews and community meetings. For example, the head of a local water users board exclaimed, “This community is about to die and has been headed toward a collapse for some time now. [Mount] Coropuna no longer has a snow peak – it is a little hat. This is an emergency.” While climate change is not the only driver of water scarcity, these conditions are spurring additional rural-to-urban migration from the Andean highlands to coastal areas.

These threats to livelihoods and climate-related displacements do not give the full picture of this particular pattern of change, however. The key context to note is that, in each country, the affected populations perceive the precariousness of their livelihoods as also, in part, the result of explicit policies associated with state-led economic development plans. Pastoralists in Uganda and Ethiopia are wary of their national government’s plans for “sedentarization” and support for large-scale commercial agriculture and other high-value investments that require large swathes of land. It is clear to these groups from both President Museveni’s statements and Ethiopia’s GTP, respectively, that the vision of central planners for the future is one in which pastoralists decrease in numbers. In Uganda, the stated preference is for pastoralists to move toward either ranching or agriculture, while in Ethiopia the GTP aims at a more productive and far more market-driven and entrepreneurial pastoralist sector.

In Peru, farmers in the Andes do not perceive the government of President Humala to be fundamentally “anti-*campesino*,” but they do feel threatened by what they perceive to be the preferential water access accorded to the highly promoted and rapidly expanding mining sector. As in Africa, climate-related threats to livelihoods in the Andes are intertwining with communities’ existing feelings that the government’s main priorities for economic development lie elsewhere. This commingling of climate change threats to livelihoods with a sense of vulnerability resulting from the country’s prevailing development strategy exemplifies an additional pattern with the potential to contribute to conflict in the countryside.

3. Climate Change and the Erosion of Identity and Social Roles

For traditional societies living in rural areas, group identity and clearly defined social roles are stabilizing forces that provide both security and meaning for individuals and communities. Threats to group identity and social values (e.g., ethnicity or religion) are well-known factors contributing to conflict in Africa (Williams, 2011). For pastoralists in general and the Karamojong in particular, distinctions between the economic, social, and cultural spheres of life are somewhat artificial. What one does in the tasks and routines of pastoralist daily life is essentially the same as who one is in the social order of the community. For the Karamojong, the possession of cattle is not merely a marker of wealth but also a reflection of group identity, and cattle play an important role in the ceremonies and rituals by which the most important group decisions are made, including decisions about whether or not to engage in conflict. In such settings, climate-related threats to livelihoods are simultaneously threats to group identity and the social roles played by individuals.

Over the past 20 years, the Karamojong’s access to water and pasture has been constrained by the restrictions on mobility placed upon them by the Ugandan military, but in the last decade, increasingly severe and recurrent droughts have greatly intensified resource scarcity. Lacking resources, the role of

young men as community providers has been eroded, and women have ranged farther from encampments on risky forays for food that expose them to the possibility of harassment and abuse from members of opposing clans. The gradual loss of authority of elders has been perhaps most consequential for social cohesion. Traditionally, elders made group decisions about where and when community members would be likely to find pasture and water. With the chronic and severe droughts of recent years, this role has become increasingly irrelevant. In southern Ethiopia as well, elders who were interviewed lamented their diminished capacity to prevent conflict resulting from a variety of factors, including the effects of climate change.

Climate change also is destabilizing for identity and social roles in the Peruvian Andes. In the highlands, glacial lakes both provide water resources and are closely linked to the identity and spiritual values of Quechua speakers. As rainfall becomes more erratic and water scarcity increases, these resources become even more important. In 2009, when Duke Energy surpassed its projected water consumption for the Cañón del Pato hydroelectric facility and lowered the water level in Lake Parón, panicked farmers took over and shut down the company's hydraulic machinery. However, livelihood concerns were not the only reasons for these actions. Communities also objected because of the lake's spiritual significance for them. In the countryside, the effects of climate change on social cohesion and cultural values can be just as powerful a cause of conflict as its negative effects on economic well-being.

3.2 CLIMATE CHANGE AS A CHALLENGE FOR POLITICAL INSTITUTIONS AND RESOURCE GOVERNANCE

Not surprisingly, the interaction of climate change impacts with politics and governance in the three case studies produced the strongest and most numerous linkages with conflict. The main concerns in this category can be clustered into several components.

3.2.1 Institutional Gaps: Data, Public Information, and Disaster Preparedness and Response

As the case studies explore in some detail, there is a significant lack of time-series weather data and location-specific knowledge about climate change in all three countries. In Uganda and Ethiopia, in addition to limited weather station coverage, conflict itself is a main reason for the absence of data, as violence often has made the collection of temperature, precipitation, and hydrological readings impossible. In Peru, the multiplicity of microclimates in the Andean highlands and valleys presents a severe challenge to the government's data collection capacity. All three countries are devoting or seeking resources to upgrade the ability of government institutions significantly to collect information and understand the effects of climate change at subnational and local levels.

At the moment, however, the dissemination of timely and accurate weather information to farmers and pastoralists is spotty at best. As frustrations with the unpredictability of climate change rise, the lack of help or guidance from government institutions becomes a source of grievances. As one local natural resource official in Uganda put it, "They tell us to expect rains and we don't get rains. They predicted an El Niño, but we never got it." The problem often appears to be as much a failure of communication as an outright lack of information, but the frustrations are the same in either case.

In view of predictions for increasingly frequent climate-related natural hazards, the general lack of national disaster preparedness and response capacity in the three case study countries has an even greater potential for generating instability and conflict. Clearly, Uganda and Ethiopia are very heavily dependent on the international community for disaster and relief assistance in response to severe droughts and floods. In Peru, a reconfiguration of institutional responsibilities for disaster response is underway with promises of more rapid and effective reactions to natural disasters when they strike. An analytic distinction is sometimes made between the instability associated with these sorts of "complex

emergencies” and instability leading to violent conflict. However, these kinds of distinctions are much neater after the fact than in real time. Much depends on the local context and specific political moment. It should be noted that, in the past, sizable protests and violence have resulted from citizen discontent with disaster responses in both Ethiopia and Peru.

3.2.2 Marginalization, Relative Deprivation, and Lack of Voice

In Uganda and Ethiopia, the tensions arising from national development plans that place a low priority on climate-affected populations’ livelihoods and give high priority to large-scale commercial development do not merely reflect the outcome of technical economic decisions. Rather, they also are an expression of the political power of respective groups, and they are understood as such by those pastoralist communities who feel marginalized, or even abused. This feeling is especially acute in Karamoja, but it is also present in southern Ethiopia. As climate change sharpens the crisis of pastoralism, the government’s allocation of resources to party favorites and entrepreneurs — or favored pastoralists with strong market linkages — deepens resentments among those who feel a sense of relative deprivation. In Ethiopia, it is widely perceived that the regional and national governments also play one vulnerable pastoralist group against another (e.g., Somalis over Oromos, or Issa over Afar) in a complex political game. Although Karamoja receives considerable attention from the Ugandan government as a perennial “problem” to be solved, the Karamojong distinctly feel their lack of political voice and perceive many government initiatives as essentially top-down efforts to control them. This includes government responses to climate change.

In Peru’s very different political context, where democracy is flawed but not absent, both the *campesinos* and young professionals of the highlands are struggling to get more attention for climate change threats from a central government traditionally more responsive to the political interests of wealthier coastal elites. Though unsettling, it is a striking irony that the climate adaptation measures fought for by Andean activists (e.g., ecological restoration, protection against glacial lake outbursts, and the construction of small dams) are actually the best insurance for a healthy water regime able to service the needs of commercial farms and urban dwellers downstream. The political space in Peru, however, is much greater than in Uganda and Ethiopia, and civil society is both more highly developed and more capable of collective action. This at times actually heightens conflict – witness the dozens of “socio-environmental” conflicts registered by Peru’s national Ombudsman’s office each month. In Peru, as elsewhere in Latin America’s democracies, conflict can in fact play a positive role when kept within nonviolent limits. The tipping point from nonviolence to violence, however, is not always readily apparent when passions are high, as they are in most of these resource-related protests and mobilizations.

3.2.3 Land Use, Water Management, and Subnational Borders

The case studies demonstrate that many of the foregoing considerations find their most concrete expression in conflicts having to do with land use and water management. For pastoralists, mobility and access to water and pasture are existential issues. In Uganda and Ethiopia, extended droughts have forced pastoralists to expand their search for these resources to new areas. In the Cattle Corridor of Uganda, rather than seeking accommodative arrangements to allow shared resource use, the national government has encouraged the removal of pastoralists from contested lands. Because of the prevalence of armed violence, mobility has been severely restricted in Karamoja.

In Ethiopia, access to land is even more conflictive because it is linked both to resource scarcity and to the administrative boundaries and jurisdictions associated with ethnic federalism. The intertwining of climate change impacts with land disputes and controversial internal border policies is potentially explosive.

Disputes over scarce and inefficiently managed water supplies are perhaps the main source of conflict in Peru. Irrigation rights are complex and often blatantly unfair. Small farmers frequently protest against large mining companies that use increasing amounts of water as they expand their operations across the country. In 2012, in an effort to quell persistent protests in mining communities, President Humala pledged that the government would never approve mining operations whose water use would prejudice the needs of local communities. Nevertheless, the protests continued. As indicated in the Peru case study, climate change is making the situation more difficult not only because of its negative effects on water availability and the hydrological regime in the highlands, but also because contamination from acid rock drainage is affecting water quality.

Moreover, as water supplies dwindle, Peru also has experienced violence linked to water conflicts between neighboring regions. Divided water management between Arequipa and Moquegua led to violence on the border between these two regions, and a second conflict was caused by fears in Cuzco that Arequipa's massive Majes Siguan II irrigation project would leave some Cusqueños without sufficient water. Water conflicts in Peru are increasingly contingent on a race between improved water management and the growing impact of climate change.

3.2.4 The International Dimension

Although somewhat outside of the ambit of the case studies as originally envisioned, it bears mention that what might be called the international dimension of climate change and conflict was raised by interviewees in each of the three countries. Both in the drylands of Uganda and Ethiopia and in the highlands of Peru, community leaders and government officials occasionally remarked upon what they saw as the responsibility of developed countries for the problems brought on by climate change. These grievances were politely stated but strongly felt. At the level of policy, several government officials objected that, given their country's limited contributions to greenhouse gases, their citizens were more needful of climate adaptation than climate mitigation. These rifts did not seem likely to portend conflict in any foreseeable time frame, but it did not seem impossible that these resentments might take a more serious form at some future date if they were politically manipulated in relation to worsening climate impacts.

4.0 CLIMATE CONFLICT, CLIMATE ADAPTATION, AND RESILIENCE

As more recent research on climate and conflict emerges, it has become almost axiomatic to say “climate change does not cause conflict by itself.” Links between climate change and conflict are even more difficult to identify if conflict is narrowly defined as armed conflict resulting in fatalities above substantial numerical thresholds.⁸

This study has taken a different approach, arguing that — based on everything we already know about conflict analysis — the complexity of interactions of climate change with non-climate factors in relation to conflict is merely to be expected. In fact, it is of a piece with other factors commonly believed to contribute to conflict. For example, it is known that very poor countries have higher incidences of conflict, but few analysts would be comfortable asserting in unqualified terms that “poverty causes conflict.” It is, indeed, more complicated than that. Yet, poverty is a major focus for researchers and international assistance agencies both because of its contributions to instability and conflict and because of its intrinsic human costs. The same holds true of the relationship between climate change and conflict.⁹

The salient question, especially for international assistance agencies seeking to identify effective programmatic interventions, is how and in what ways climate change impacts may be consequential for conflict, and how that knowledge can be used in conflict mitigation and climate change adaptation. The kinds of interrelationships between climate and non-climate factors identified in the patterns of change and institutional challenges described above suggest a variety of points of intervention. The case studies of Uganda, Ethiopia, and Peru also provide examples of the kinds of institutional and community stakeholders who are likely to need to be a part of successful climate-related initiatives. The selection of the precise program initiatives appropriate for any given country is contingent, of course, on country-specific priorities and conditions. The one running thread through all of the case studies is the absolute necessity of including the participation of the women, young people, and men from affected communities. Their perceptions, decisions, and actions will serve to animate or inhibit conflict in the face of climate change impacts.

There is one important way in which climate change impacts *are* unlike any other contributing factor to conflict. We know with virtual certainty that they are just beginning to be felt and they are going to get worse — possibly much worse. Unlike ethnic tensions, religious schisms, economic trends, or political upheavals, we know where the trajectory of climate change is headed,¹⁰ if only as a result of the inertia already present in global climate systems.¹¹ The difficulties of achieving climate change mitigation also remain evident. Our analysis of the relationship between climate change and conflict, then, is just at the beginning of the story, not necessarily a barometer of what it may be in the future. Addressing climate-conflict issues now is like buying an insurance policy with a fairly low premium. Later, the costs are likely to go up.

Fortunately, a great deal can be done in terms of climate adaptation to avoid many of the worst-case scenarios envisioned in the early climate-and-conflict literature. Many of these climate adaptation measures are enumerated and described in the full-length versions of the three climate change and

conflict studies, but a brief list of some of the most important would include climate-resilient seeds, crop storage, water and soil conservation, small-scale irrigation, livestock diversification, improved farming techniques, better market linkages, insurance schemes for pastoralists and agriculturalists, integrated watershed management, and enhanced forecasting and local-level projections of weather trends. As the case studies indicate, however, it would be a mistake to consider these simply technical fixes. Their implementation will also require a combination of institutional reforms and strengthened social organization that will be as or even more challenging to achieve. Not infrequently, these sorts of transformations also will require political support, consume state resources, or otherwise have implications for the competing interests of stakeholders in government, civil society, the private sector, and communities. In other words, the climate adaptation agenda can be diverted, obstructed, or undermined by a variety of tensions and conflicts.

Moreover, as the maps of climate vulnerability in Africa produced by CCAPS and others demonstrate, one can assert almost as a general rule that the places most in need of climate adaptation in Africa tend to be the most affected by conflict. A global USAID analysis found that 81 percent of countries considered fragile also were projected to experience significant climate change impacts.¹² Thus, the climate change adaptation agenda and the conflict mitigation agenda are bound up with each other. Conflict specialists can no longer do their job without asking about the possible implications of climate change, and climate adaptation specialists cannot do their job without seriously considering conflict sensitivities. As recent research from southern Ethiopia also indicates, where conflict exists, the establishment of peace and security is often a crucial precursor to building climate and livelihood resilience (Mercy Corps, 2012).

The lessons learned from the climate change and conflict case studies have relevance for building the resilience of communities as they face more frequent droughts, floods, landscape changes, and crop failures. Perhaps the pivotal concern identified in the climate change and conflict case studies, as in many current efforts to build resilience, is sustainable livelihoods. What the case studies serve to show is the extreme conflict sensitivity likely to be associated with program initiatives aimed at building that resilience. Conversely, the case studies also show that there are many opportunities for participatory climate change adaptation to make a lasting contribution to conflict mitigation and peacebuilding and for peacebuilding or conflict resolution interventions to be essential precursors or elements of effective climate change adaptation interventions. Climate change adaptation programs address crucial natural resource use and livelihood issues. To be successful, they must be participatory; and by engaging marginalized communities, they address the perceived lack of participation and representation that is one of the main sources of instability in all three countries.

5.0 KNOWLEDGE GAPS AND FUTURE RESEARCH

Although the cases of Uganda, Ethiopia, and Peru provide a good deal of material for analysis and reflection in relation to the question of climate change and conflict, they obviously constitute a limited comparative base. Some of the limitations are readily apparent. First, they are limited geographically, covering only a corner of the Greater Horn of Africa, while not including any of the very different terrains and populations of the central, southern, and western regions of sub-Saharan Africa. Similarly, while Peru serves as a good representative for conditions in the Andes, it is dramatically different from Latin American countries in Mesoamerica, and even more distant from realities in the Caribbean. Second, the African cases place a special focus on pastoralism, while the Latin American case brings attention to the high-altitude ecosystems and Amerindian populations of the Andes. Both are natural candidates for climate-related assessments because of their sensitivity to climate variation, but their applicability in terms of the range of possible livelihoods and ecology in the two regions is still quite narrow.

The fact is that around 75 percent of Latin American citizens live in cities, and Africa is embarking upon by far the fastest rate of urbanization in its history. Yet, very little research has been done on the increasingly important question of climate change and conflict in cities. Similarly, while the three case studies examined are limited to inland areas, there is a significant shortage of climate-and-conflict studies dealing with coastal regions, and almost nothing dealing with these issues in relation to sea level rise. In short, there is a huge gap in knowledge on climate change and conflict in urban areas, coastal zones, and areas vulnerable to sea level rise. Some metropolises in regions like West Africa or the Caribbean combine all three of these characteristics.

The most recent research on climate change and conflict is focused less on “waving the red flag” in warning about possible climate catastrophes and more on exploring correlations between weather and conflict or understanding the role institutions can play in preventing conflict (e.g., Raleigh and Kniveton, 2012; De Stefano et al., 2012; Goulden and Few, 2011). Downscaling in the mapping of climate-conflict hotspots, especially in Africa, also continues. A logical next step is to begin to link up this latter work with the findings of qualitative case studies of the sort discussed here. Ultimately, the task of understanding the interactions and relationships of climate change and conflict requires the steady accumulation of a stronger and more comprehensive comparative base and clearer specification of hypothesized empirical relationships. These two streams of inquiry should continue to inform each other as they move forward.

In the meantime, there is a practical need for development specialists in the field to apply those preliminary insights that have emerged from these case studies and other research. As a first step, a series of diagnostic questions for development specialists can provide some of the necessary background for discussion and consideration of programs and initiatives aimed at advancing conflict-sensitive climate adaptation measures. A preliminary set of tasks and questions for group discussion follows in two parts in Appendix I. The first set of tasks and questions is based on a condensed and revised selection from the Climate Change and Conflict Assessment Framework used for the case studies. The second set of questions generates information related to the potential climate-conflict linkages identified in the discussion above.

ENDNOTES

- ¹ For specialists in conflict analysis, “conflict” is often meant to refer to deadly violence above a given numerical threshold that involves government as one of the protagonists. For example, the Uppsala Conflict Data Program tracks armed conflicts above 25 battle-related deaths in which the government of a state plays a role. This formal definition excludes intrastate conflicts that fail to meet one or both of these criteria, even though these kinds of internal conflicts are highly consequential for the programs of international assistance agencies. Additionally, conflict prevention and mitigation require attention to the precursors of violent conflict, including the emergence of group grievances, the organization of the material and social capacity for collective action (mobilization), and the potential impact of triggering events. For these reasons, the term “conflict” is used here in the more common and less technical sense of opposing interests that give rise to social and political tensions and instability likely to lead to actual or potential violent conflict.
- ² One exception was the collection of country-focused essays published in *Climate Change and National Security: A Country-Level Analysis*, edited by Daniel Moran. One of the main virtues of this volume was the contributors’ “common reluctance to detach climate politics from politics in general.” Although the chapters began as presentations at a workshop sponsored by the National Intelligence Council in 2008, they were not published in revised form until 2011.
- ³ Since these reports and studies were produced for other purposes, this is not a criticism but rather an observation about their limitations.
- ⁴ In 2011, the CCAPS program conducted a series of interviews in several African countries to try to ground truth the results of CCAPS vulnerability modeling. There were a number of divergences between the CCAPS model and the perspectives of interviewees. For example, “CCAPS’ explicit focus on security and humanitarian risks” was found to be “different from many local actors’ emphasis on livelihoods.” Similarly, interviewees placed more emphasis on rural areas and pastoral populations. See Robert S. Strauss Center for International Security and Law, 2012.
- ⁵ The questions listed are less a script than a characterization of the information sought, but it is worth noting that the question of when (or whether) to directly mention climate change is an important one. In the great majority of group meetings, climate change was not mentioned in advance by the researchers. (One community meeting in Peru was arranged by a USAID implementer working explicitly on a climate adaptation program, which made climate change a “built-in” topic of discussion.) With interviewees ranging from high-level government officials to residents of remote communities, what constitutes a “leading” question also differs according to context. It is worth noting, too, that the problem is not just one of *leading* questions but also of *misleading* questions. Talking about climate change is not unknown in many locales, even in the countryside. If focus group participants perceive that interviewers are withholding the real purpose of their questions, the situation is also problematic. In all cases, there is no substitute for interviewers being aware of these issues and exercising their best judgment.
- ⁶ Weather station data for these districts in Uganda are limited, but data for Nakasongala show a marked reduction in rainfall over the period 2001-2005 compared to 1994-2000. See Stark and Mataya, 2011, pp. 32-34.
- ⁷ It should be noted that *Prosopis* also is better adapted to the area’s typical climate variability, making it difficult to sort out to what extent its spread derives specifically from climate change. But to the extent that climate change has increased drought frequency, *Prosopis*’s comparative advantage has increased.
- ⁸ See, for example, the essays in the special issue on climate change and conflict in the *Journal of Peace Research* 49(1) 2012, especially the introductory essay by Nils Petter Gleditsch.
- ⁹ Put another way, assessments of climate change and conflict are not *sui generis* but *one type* of conflict assessment.
- ¹⁰ According to the *Fourth Assessment Report of the Intergovernmental panel on Climate Change* (IPCC, 2007), temperatures are “virtually certain” (above 99 percent), more intense precipitation is “very likely” (above 90 percent), and more intense cyclones and drought are “likely” (above 66 percent).
- ¹¹ Population growth is probably the only other factor sometimes associated with increased conflict that has a comparably known trajectory. But if one compares climate and population trends, it is clear that there has been progress since about 1990 (according to U.S. Census Bureau figures) on slowing the rate of global population increases, while there has been no progress to date (according to Environmental Protection Agency data) on slowing global carbon emissions. This does not take into account the lag time in the manifestation of climate change effects produced by carbon emissions and potentially important non-linear events such as the feared release of methane from frozen Siberian tundra zones.
- ¹² This statistic was reported during a USAID presentation at the Wilson Center in Washington, D.C. for a panel on “New Research on Climate and Conflict Links” on December 19, 2011.

APPENDIX I: DIAGNOSTIC TASKS AND QUESTIONS ON CLIMATE CHANGE AND CONFLICT

PART ONE

The purpose of this group exercise is to generate background information and discussion. It assumes some firsthand knowledge of the country and the area to be discussed, but it is not intended to represent a formal assessment or require extensive additional research. Where there are gaps in your knowledge, note them for follow-up and continue with your discussion.

I: Identification of Study Area

Select a conflict-prone area that has experienced extreme climate variability (e.g., droughts, floods, unseasonal temperature fluctuations).

Where possible, identify instances of conflict within these areas that you believe may have had direct or indirect linkages to climate variability.

II: Profile of the Study Area

Using both quantitative and qualitative data, what are the area's known weather and climate patterns and predicted future changes in climate?

What are the potential political, economic, social, cultural, and historical cleavages that may contribute to current instability or conflict?

What is your assessment of the governance capacity and resiliency mechanisms of existing political, economic, social, and cultural institutions in the area?

Identify the key concerns, grievances, and tensions that may be present. This should focus on the local unit of analysis but incorporate national, regional, and international influences.

III: Analysis of Critical Climate Change Concerns

Identify which economic sectors, livelihoods, and resources potentially influenced by climate change are critical to stability.

How are they critical? Who is affected when these are threatened? What have been and what could be the potential consequences?

Assess the impact of governance, with special attention to environmental governance,¹ on the identified sectors, livelihoods, and resources. What mitigating or exacerbating role does it play in relation to conflict?

IV: Assess the Impact of Climate-Related Events

Identify a specific climate-related event or specific period of climate variability in the area under study.

What range of response options did affected people and communities consider? What responses were applied? Whom did affected people and communities reach out to for help? Were resilience-building strategies used? What were the results of those strategies?

What role did social, human, physical, financial, and natural capital assets play in exacerbating the potential for conflict or mitigating conflict/building resilience?

V: Perspectives of the Affected Populations and Communities

Identify stakeholders interested in and affected by climate-related challenges.

In your estimation, what are the stakeholders' concerns, core grievances, and points of conflict? To what degree is each affected by climate threats? What is their response capacity, and what are their perceptions of the social and institutional responses to climate-related events? Do they have the means or potential to engage in violent conflict?

Seek to identify indicators of resilience versus indicators of vulnerability to conflict.

VI: Generate Future Scenarios

Based on the findings from your discussions and projected climate change trends, develop scenarios of the potential impact of climate-related events on the affected people or communities in the area. Is potential or actual conflict a part of any of these scenarios? If so, what are the mechanisms by which conflict might emerge?

PART TWO

The second exercise provides questions for thinking about patterns of change and institutional challenges linking climate change and conflict, especially in rural settings with traditional societies.

- In what ways is environmental change occurring?
- What are the drivers and impacts of this environmental change?
- Are there marked shifts in seasonality (e.g., the onset, duration, and intensity of rains)?
- Are there are other major shifts such as increased intensity of heat and dry spells?
- How is environmental change disrupting traditional knowledge and practices? Is this environmental change related or unrelated to climate change?

¹ Environmental governance is defined here as the traditions and institutions by which power, responsibility, and authority over natural resources are exercised.

- How is climate change negatively affecting livelihoods? How does that change relate to larger economic transitions in the country? Are national and local governments responding to the negative effects of climate change on livelihoods? How do affected communities perceive their situation and government responses?
- How is climate change affecting identity groups and social cohesion in the study area? Within identity groups, are social roles changing in response to climate change effects? If so, why and how?
- What information about climate trends or anticipated erratic weather is needed in rural areas? Is this information available? Is available information communicated effectively and appropriately to key groups? What is the perception of affected communities?
- What is your estimation of the level of disaster preparedness and response in view of increasingly frequent climate-related hazards (droughts, floods, etc.)? Could citizen perceptions of inadequate disaster response lead to instability and conflict?
- How does climate change differentially affect the needs and interests of stakeholders in the region? Do communities perceive government to be responding to climate change challenges in an evenhanded manner or are some groups seen as favored over others? How does this relate to existing asymmetries of political and economic power among various groups?
- How do concerns about land use rights and access to water intertwine with climate change impacts? What are the manifestations of competition and tensions among stakeholders for scarce resources? Do the national and local institutional mechanisms of resource governance ameliorate or exacerbate these frictions?
- Is resource competition complicated by internal borders or administrative boundaries? Are territorial rights applied or adjudicated fairly or are these the source of further stresses that may contribute to conflict?
- Reviewing your answers to the foregoing questions, what are the possible precursors to climate-related conflict in the area? What are the most powerful or significant components of these factors or patterns of change?
- Given your analysis, what sorts of programs or initiatives might help to advance conflict mitigation, promote conflict-sensitive climate change adaptation, and build resilience?
- Are there opportunities to involve the participation of local communities in climate change adaptation activities that support peacebuilding?

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