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DECONSTRUCTING PREVENTION:

THE MISSING LINK IN THE HUMAN SECURITY APPROACH TO CLIMATE CHANGE

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I. INTRODUCTION

> *It's the year 2030. The global population is inching closer to the 9 billion mark, which it is expected to reach in a mere 10 years. 47% of the population now lives in areas of high water stress.[1] Since 2012, the world's need for food has increased by 50% and water by 30%. The livelihoods of people in low-lying regions are threatened by rising sea levels. Internal and cross-border migrants are at an all time high, increasing population pressures on already-stressed environments.*
>
> *Sub-Saharan Africa, in particular, is the region upon which climate change has taken the greatest toll due to multiple stresses and low adaptive capacities. By 2020, 250 million people already suffered from water insecurity, and that number is estimated to double by 2050. Increased food insecurity and malnutrition have spread across numerous countries as yields from rain-fed agriculture, a main source of food for local communities, has reduced by 50%.[2]*

This may be our fate; this may even be the best-case scenario if the international community continues to fail to act in the face of climate change. Throughout modern history, the human security of all people has never been threatened by an uncontrollable force on the scale by which it is threatened by climate change today. As the irreversible effects of climate change continue to strengthen their grip on the environment, the threat to human security will increase as populations will face competition and a threat to life due to the depletion of life-sustaining resources. If the international community continues to fail to take a preventive approach to threats to human security stemming from climate change, states, institutions and humanitarian organizations will increasingly struggle to address massive migration or increased instability.

Although the human security concept entered international dialogue in the 1990s, states and institutions have continued to employ the top-down approach to human security - an approach customary to traditional national security threats that stresses actions that states can take or policies states can implement to protect security. The top-down approach has directed nearly all attention and efforts towards the reduction of GHG emissions to lessen future threats to international peace and security, although negotiations are currently at an impasse and have been for many years. GHG emissions are only a small piece of the puzzle, and do not address the human security implications of climate change that are occurring and will continue to grow.

This has resulted in a gap in the international approach to human security threats stemming from climate change- the absence of a fundamental bottom-up approach upon which the original concept of human security was founded. Civil society organizations, particularly those with a human development mandate, have the tools, expertise and experience to fill this gap in the international approach. However, engagement of civil

society in climate change dialogue remains sparse due to conceptual and institutional barriers.

The first lies within civil society itself. Human security NGOs have adopted two separate components of the human security concept. Organizations that emphasize the human protection component, which prioritizes civil and political rights, have a prominent voice in the international arena and have been able to interject human protection concerns into the international agenda. However, human protection organizations do not yet emphasize climate change as a threat to human security. On the other hand, organizations that emphasize the human development component, which focuses on economic, social and cultural rights, stress climate change as a threat to human security but operate primarily outside of the international agenda. This is due to the acceptance of and consensus on civil and political rights within the international community versus economic, social and cultural rights that are still widely debated. This fine line between categories of rights is what lies at the root of the separate components of human security. This divergence existed within civil society prior to the introduction of the human security concept in the international community.

However, climate change is an unprecedented threat to human security that bridges both components and prevention cannot be effective without mutually-reinforcing development and protection. If these threats can be effectively realized, a convergent approach to human security can occur. A convergence of components within civil society would increase its capacity to interject human security threats of climate change into the international agenda, primarily through human protection organizations that are deeply engaged at the international level, and would provide an array of tools, expertise and experience that are unique to human development organizations and fundamental to prevention. This is necessary because civil society cannot take up this task on its own as effective prevention requires resources and policy-making of states and international institutions and cooperation to facilitate information sharing and increase efficiency and effectiveness. The second barrier is institutional and prevents the engagement of NGOs in international dialogue thereby hindering cooperation. Both of these barriers can and must be broken.

This paper will deconstruct prevention of human insecurity by identifying inadequacies of the current international approach to human security threats stemming from climate change and providing policy prescriptions for how these gaps can be filled through engagement with civil society. This will be followed by an identification of barriers to civil society engagement and an analysis of tools that can provide a bottom-up approach to human security. Lastly, it will analyze the final and key component to an effective preventive approach to human security: cooperation.

As the effects of climate change become more pronounced, the time for preventive action dwindles. The detrimental impacts have already begun to take hold and will continue to do so. This is an unprecedented threat but also provides an

unprecedented opportunity for the international community to take a preventive role, rather than the traditional reactive role, to ensure the security of the world population.

II. INADEQUACY OF THE INTERNATIONAL APPROACH TO HUMAN SECURITY IMPACTS OF CLIMATE CHANGE

Forty-one years ago, the United Nations (UN) Conference on the Human Environment met in Stockholm, Sweden and determined that it was the "urgent desire" of all people and the "duty" of all governments to protect and improve the human environment.

> A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well being depend.[3]

More than four decades have passed and the same concerns are repeatedly uttered by world leaders, but this time, "massive and irreversible harm" has already been done.

The origins of the current approach to security lie in the articulation of the national security concept of the Cold War era, which prioritizes military threats to the state as a whole and "presupposes that threats arising from outside the state are somehow more dangerous to its security than threats that arise within it." Responses to national security were framed almost entirely within a state-centric context, as what actions or policies the state could undertake to address threats. This concept was found to be inadequate in addressing post-Cold War security threats because it did not account for new realities such as the rise of prominent actors outside of the state and globalization. States began to realize the danger of "societal risks" as opposed to solely national dangers that can be addressed using military force.[4]

The traditional concept of national security evolved to incorporate collective security in which inter-governmental bodies, such as the European Union and North Atlantic Treaty Organization (NATO), played a much greater role in international relations. However, just a few years later in the early 1990s, the failure to prevent genocide in Rwanda and Srebrenica, to address the conflict in the former Yugoslavia and to resolve the Gulf War through collective efforts led to a full reconceptualization of security. "Recognition that national security does not necessarily equate to better lives for most people gave rise to the concept of human security, which served to critique the effects of national security on human well-being." [5] The human security concept incorporated threats "not only [to] human beings, families, and communities….but…humankind," rather than solely military threats to national security.[6]

The purpose of the human security concept is as follows:

> To protect the vital core of all human lives in ways that enhance human freedoms and human fulfillment. Human security means protecting fundamental freedoms – freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people's strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity.[7]

In 2003, the Commission on Human Security (CHS), which was created in response to the outcome of the United Nations Millennium Summit, prepared a guide for the human security concept that listed three ways in which the human security concept transformed traditional security. First, "traditional, state-centric conceptions of security that focused primarily on the safety of states from military aggression" were supplanted by a concept of security "that concentrates on the security of individuals, their protection and empowerment." Second, the concept highlighted a "multitude of threats that cut across different aspects of human life," thereby identifying the deep relationship between security, development and human rights. Lastly, the concept promoted a comprehensive, "coordinated and people-centered approach to advancing peace, security and development."[8]

The CHS also identified five main features of the concept, each of which are vital to upholding human security in the face of climate change threats. These features include: people-centered, multi-sectoral, comprehensive, context-specific and prevention-oriented.

The prevention-oriented feature involves a dual-focus on protection and empowerment, which are mutually-reinforcing. Protection entails a top-down approach in which international actors, including states, have the primary responsibility, international and regional institutions, NGOs and the private sector implement systematic norms, processes and institutions to protect people from threats. [9] Complementarily, empowerment entails a bottom-up approach in which individuals and communities are enabled to develop resilience to threats, make informed decisions and participate in solutions to ensure human security for themselves and others.

To date, international approaches to the human security impacts of climate change remain solely within the realm of protection, employing a top-down approach through implementation of international policies. This approach does not keep pace with the rest of the globalized world. "Although a great deal of the substance of politics has been globalized, the process of politics has not. Its main institutions …remain rooted at the national level."[10] This raises a serious problem as protection and empowerment are mutually-reinforcing and therefore are both "required in nearly all situations of human insecurity, though their form and balance will vary tremendously across circumstances."[11] In addition, states have prioritized and focused nearly all of their

attention on mitigation, which is only one component of protection, and these policies have been unsuccessful to date, with current negotiations at an impasse.

Climate change is already negatively impacting the human security of vulnerable populations. Addressing only one root cause of the problem will not provide for a solution. In fact, the current approach focuses almost solely on reducing impacts decades, if not centuries, from now.

There are three main gaps in the current international approach to human security implications of climate change: a prioritization of mitigation, a hierarchical categorization of human rights and a lack of preventive action due to the absence of international cooperation. This is not solely because of a failure of states to act, but also because their capacity for action to comprehensively address human security implications of climate change is simply inadequate.

PRIORITIZATION OF MITIGATION

The period of earth's history since the industrial revolution has been deemed the "Anthropocene," an era during which production and consumption patterns have had direct impacts on the earth's system.[12] Greenhouse gas (GHG) emissions and aerosols, as well as natural drivers, produced by or resulting from human activities, are considered drivers of climate change, as they have altered the composition of the atmosphere and resulted in what is known today as climate change.[13] It was not until more than two centuries after the start of the industrial revolution that states took collective action against anthropogenic drivers, which, by then, were already resulting in visible environmental degradation.

The concept of environmental threats to security first emerged at the UN Conference on Human Environment in 1972, but it was not until the late 1980s that the environmental security regime began to develop.[14] In 1983, the discourse gained momentum when Richard Ullman, one of the first modern thinkers to garner attention to the link between the environment and security, redefined a "security threat" to extend from the military into the environmental realm. Ullman defined a threat as:

> An action or sequence of events that (1) threatens drastically and over a relatively brief span of time to degrade the quality of life for the inhabitants of a state, or (2) threatens significantly to narrow the range of policy choices available to the government of state or to private, nongovernmental entities within the state.[15]

Within the first component of his definition, Ullman considered threats to include droughts, floods, epidemics, natural disasters, drastic deterioration of environmental quality or simply any "interruption in the flow of critically needed resources or, indeed, a dwindling of the available global supply."[16] Just a few years after Ullman, Jessica Tuchman Mathews, president of the Carnegie Endowment for International Peace who was serving as founding vice president of the World Resources Institute at the time,

theorized that the "new security threats" that states would be confronted with in the future included population growth, resource scarcity and environmental degradation.[17]

The consequences of anthropogenic drivers became undeniably clear in 1990 with the release of a report from the Intergovernmental Panel on Climate Change (IPCC), which was been formed by the UN Environmental Progamme (UNEP) and the World Meteorological Organization (WMO) in 1998. The IPCC declared with certainty that human activities increase atmospheric concentrations of GHGs and result in a warming of the average global temperature.[18]

To predict the implications of GHGs on the environment, the IPCC later developed a series of possible scenarios to project climate changes, which revealed that between 2090 and 2099 the average global temperature will have increased between 1.1 and 6.4 degrees Celsius (2 – 11.5 degrees Fahrenheit) from 2000 levels. When adjusted to a "best estimate," the range is scaled back to 1.8 – 4.0 degrees Celsius (3.1 – 7.2 degrees Fahrenheit). However, the wide variability in projections only occurs in the later part of the century. If calculating temperature increases between 2011 and 2030, all scenarios project an increase between .64 and .69 degrees Celsius. The primary effects of climate change include an increase in the global average temperature, warm spells and heat waves, heavy precipitation events, drought increases, extreme weather and sea level rise. In addition, each of these effects has and will continue to have impacts on human security.

States took the first step towards mitigating these effects with the adoption of the UN Framework Convention on Climate Change (UNFCCC) in 1992, through which countries committed to take steps to limit the average global temperature increase through GHG reductions and to cope with inevitable impacts. By 1995, countries realized that these reductions were inadequate and developed the Kyoto Protocol to legally bind countries to emission target reductions.

Overall, more countries were successful in meeting their commitments during the first Kyoto Protocol commitment period, 2008-2012, than those that failed. However, the United States (US), a top contributor of GHG emissions, is not a party to the protocol and therefore has no obligation. Additionally, as developed countries were reducing their emissions during the first commitment period, emissions throughout the rest of the world increased drastically, especially in China, Brazil and other emerging economies. This resulted in more than a 10% increase in worldwide CO_2 emissions, the primary anthropogenic driver of climate change, between 1990 and 2012.[19] Currently, negotiations for a second commitment period are at an impasse.

Despite mitigation attempts, worldwide GHG emissions have not been reduced, which will result in greater impacts in the future. This top-down approach has been inadequate and has ignored the short-term impacts of climate change on human security, thereby ensuring an ultimate failure to prevent insecurity.

HIERARCHY OF HUMAN RIGHTS

As mentioned earlier, states have employed a protection-oriented approach to human security and neglected the mutually-reinforcing empowerment aspect. The protection focus is synonymous with the protection of "first generation rights," or civil and political rights as defined in the International Covenant on Civil and Political Rights (ICCPR), which are upheld by a state through inaction, meaning the state must simply avoid certain actions. Due to the fact that these are negative rights, that there is a general consensus on their articulation and that these rights are upheld through *inaction* rather than *action*, the human protection approach has been prioritized by states within the international community. Protection is more limited and therefore, theoretically, more feasible.[20]

The empowerment focus, which emphasizes development, is synonymous with economic, social and cultural rights, or "second generation rights," as defined in the International Covenant on Economic, Social and Cultural Rights (ICESCR). ICESCR rights are considered more ambiguous, which has posed a barrier to its inclusion in international dialogue. These are rights that governments must "progressively realize to the maximum of its available resources," which has resulted in ambiguity as to how these rights can and should be fulfilled, how to measure progress, who is to be held accountable and what accountability mechanisms exist to ensure that they are upheld. A lack of consensus has resulted in economic, social and cultural rights remaining secondary to civil and political rights on the international agenda.

Fuelling this ambiguity even more are the newly developed collectively-developmental rights, or "third-generation rights."[21] The adoption of the 1992 Rio Declaration on Environment and Development resulted in this unofficial sub-group of rights being most closely associated with the impacts of climate change.[22] Although the declaration is "soft-law," it suggests that all humans have a right to economic and social development, a healthy environment, natural resources, intergenerational equity and sustainability, among other rights. The human rights implications of climate change have been increasingly contextualized within ICESCR rights. Unfortunately, to date, the human security impacts of climate change have been categorized as threats to economic, social and cultural rights, and in some cases as threats to collective-developments rights, which will prove to be a miscalculation.

The prioritization of protection by states and international institutions and the categorization of climate change threats as a concern solely for human development has resulted in the absence of climate change impacts on human security within the international human security dialogue.

LACK OF PREVENTIVE ACTION

A top-down approach, which focuses on the prioritization of mitigation, and a failure to take collective action has resulted in a lack of preventive action in addressing

the negative human security impacts of climate change. Although the reduction of GHGs is a component of prevention in the long-term, it is only one component, and has failed to date. The consequences of stalled UNFCCC negotiations alone are going to be drastic, yet action from states to address already-occurring climate impacts on human security remains nonexistent.

The Sahel is facing a drought that has increased economic and political instability, hunger, migration, and malnutrition, and which UN Secretary-General Ban Ki-moon has deemed "a warning for all" as "the resilience of societies and systems will be tested [by climate change] in all regions."[23] Sea level rise has accelerated in the last decade, to nearly double that of the last century.[24] The average global surface temperature is progressively increasing, with the five hottest years on record since 1997 and the 10 hottest since 1990.[25] Ocean temperatures are gradually warming, resulting in more severe storms and hurricanes.[26] An increasing number of extreme weather events are taking place each year. Seasons are shifting and the oceans are becoming more acidic.[27] These consequences have and will continue to negatively impact life-sustaining resources, threatening human security.

The impacts of climate change are not and will not be evenly distributed throughout the world.[28] Although developed countries have contributed the greatest share of GHG emissions, both cumulatively and in recent years, developing countries that continue to struggle economically will face the brunt of consequences from those emissions. Developed countries only held a 20% share of the world's population in 2004, yet they produced 57% of the world's Gross Domestic Product based on Purchasing Power Parity (GDP_{PPP}) and accounted for 46% of global GHG emissions.[29]

In addition, the capacity of a state to adapt to and mitigate the effects of climate change "is dependent on socio-economic and environmental circumstances and the availability of information and technology," thereby resulting in greater vulnerability to climate change impacts in economically weaker states, especially those facing multiple stresses.[30] At a sub-state level, impacts are also likely to "disproportionately affect the poor" and pose a greater risk to less-developed areas.[31]

This disproportionate balance of contributions and vulnerability is reflected in the principle of "common but differentiated responsibility," which recognizes historical differences in the contributions of developed and developing countries to climate change as well as their differences in economic and technical capacity to address the effects of climate change. In an attempt to address this discrepancy, states and international institutions have established numerous funds to assist vulnerable countries with adaptation. These various funds were the first concrete step by states to attempt to address human security impacts of climate change by acknowledging varying vulnerabilities and promoting sustainable development through adaptation, not only mitigation. However, greater analysis shows that these attempts have been nearly as unsuccessful as UNFCCC negotiations.

The Global Environmental Facility (GEF) was established in 1991 to support sustainable development initiatives by providing grants for projects related to biodiversity, climate change, international waters, land degradation, ozone depletion and organic pollutants. In regards to climate change specifically, mitigation projects have focused on reducing or avoiding GHG emissions through renewable energies, energy efficiency, sustainable transportation and the management of land use, land-use change and forestry. Projects have targeted developing countries to promote immediate and long-term adaptation measures through policies, plans, programs, projects and actions. One of the key components of the GEF is that it has strived to partner with not only states and international institutions, but also civil society organizations and the private sector. Unfortunately, the GEF has been criticized for employing a top-down approach, a lack of timeliness, failing to involve local communities in project implementation and decision-making, and not correcting the balance between developed and developing countries, as there is no requirement for developed countries to contribute funds despite "differentiated responsibilities."[32]

The GEF also oversees two other funds. The Special Climate Change Fund (SCCF) was created to finance initiatives for adaptation, technology transfer, capacity building, management of energy, transportation, industry, agriculture, forest and water as well as economic diversification. The second fund, Least Developed Countries Fund (LDCF), supports least developed countries to prepare and implement National Adaptation Programmes of Action (NAPAs), which are reports submitted by states to identify urgent and immediate needs for adaptation measures in hopes of preventing increased vulnerability or costs at a later stage. However, it has been found that NAPA processes face the same constraints on effectiveness and legitimacy as other national planning processes, particularly in consultation processes that tend to have a narrow focus and be unrepresentative or exclusive to certain stakeholders.[33] In the absence of citizen and civil society engagement and democratic structures, sustainable adaptation and resilience to climate change is little more than rhetoric.[34] A bottom-up approach is absent but is necessary to ensure "that the immediate needs and concerns of the most affected communities are included in the list of projects for funding under NAPA."[35]

Another fund, established under the Kyoto Protocol, the Adaptation Fund finances adaptation projects in developing countries that are vulnerable to effects of climate change.

The largest of the funds, the Global Climate Fund (GCF), which was created within the UNFCCC framework in 2010, aims to engage relevant institutions and stakeholders within countries receiving funding in order to determine where mitigation and adaptation funding should be targeted. The fund has the potential to bridge the technology gap between developed and developing countries- another disadvantage facing vulnerable states as they do not have the resources or technologies to reform their own policies and practices.

In theory, the varying climate funds are on the right path. However, the lack of timeliness, poor project planning, poor funding and a top-down approach has led to a failure to effectively and efficiently address the human security impacts of climate change.

As stated by Don Eberly, founder of the Civil Society Project, "There is a dawning recognition that in a 'flattened' and decentralized global environment shaped by local innovation, the standardized bureaucratic approaches get in the way of progress."[36] The over-prioritization of mitigation and the failure of preventive adaptation policies, both stemming from a top-down approach, highlight the inadequacies of the current international approach to climate change.

Every day that preventive efforts fail, the implications of climate change grow. Current trends "endanger the survival of humankind."[37] As former Japanese Prime Minister Mr. Takco Fukuda stated during the InterAction Council High-Level Expert group meeting, "The Interrelated Problems of Environment, Population and Development" in 1985. "Effective cooperation is a prerequisite for human survival."[38]

Nearly three decades later after Fukuda's statement, effective cooperation has yet to exist. The current approach taken by states is "much too narrow view of what environmental politics is, and ought to be, about,"[39] as stated by Robert Garner, a political theorist at the University of Leicester in the United Kingdom who has focused his studies on the environment. There is a need to look at the role of non-state actors, including civil society organizations, and their role in addressing climate change threats to human security. Garner has built on this by saying, "This leads us away from a focus on states and international negotiations towards a focus on civil society, and a strategy to create a more environmentally aware citizenry."[40]

III. CIVIL SOCIETY ORGANIZATIONS: THE MISSING LINK

In the early years of the post-Cold War era, the world began to globalize not only economically, but also socially. Globalization opened up a space in the international forum for civil society to grow transnationally, and the concept of security evolved to reflect the changing international dynamics. Civil society organizations (CSOs) play an important and dynamic role in international affairs, based on their claim to the interests of individuals. Many modern CSOs emerged to function as a counterbalance to the state, employing a bottom-up approach to represent the interests of certain populations or groups. Throughout the past decade, non-governmental (NGOs), a form of civil society, have played an increasingly important role at the international level in compelling action from states and international institutions. Unlike international political processes that remain state-centric, CSOs "have proved well able to adapt to working in strong global organizations and networks."[41]

The concept of civil society is widely debated and has evolved over centuries.

Within the context of climate change, humanitarian NGOs, at the local, national, regional and international levels and the scientific community have the potential to fill the current human security gap in the international debate on climate change. However, humanitarian NGOs have remained absent in international dialogue, and both humanitarian and scientific organizations have yet to effectively realize their complementary roles. Approaches, priorities, experiences and tools of humanitarian NGOs are adequate and necessary to address current and prevent impending human security threats stemming from climate change.

BOTTOM-UP APPROACH

A bottom-up approach lies at the core of the human security concept and is the foundation of modern civil society. The purpose of most modern CSOs is to represent the unheard voices of a certain population or amplify the voice of a particular group to increase their influence, thereby fulfilling its primary purpose of countering the state. Within the context of climate change, a bottom-up approach to human security is necessary to effectively address varying sub-state vulnerabilities.

> The analysis starts with people first and works backward to understand the circumstances, social, cultural and ecological threats, challenges, vulnerabilities and risks that render them insecure and may contribute to conflicts or cooperation. Focusing on human vulnerabilities, and then working back to understand the causes of those insecurities is an approach that differs from the earlier phases although it builds on many of their insights.[42]

In addition, a bottom-up approach allows for the engagement of stakeholders. To date, the small role that states and international institutions have played in adaptation has focused primarily on what scientists and experts believe to be the best policy option and has a top-down thought process. However, environmental concerns are only one component within a complex system and additional factors must be considered. Past case studies have shown that engagement of stakeholders in public policy making is of "utmost importance…since many new policies can only be effective and successful if they are accepted by the majority of affected people."[43] In addition, past cases of cooperation between citizens and experts has shown that citizens are much more capable in dealing with complicated social and technical questions.[44] "Solutions to many complex problems are found through more, rather than less, interaction between citizens and experts" and "nowhere are the conflicts between citizens and experts more salient than in environmental politics."[45]

Frequently, CSOs have served as the mediator between local citizens and top-down government policies. The ability of NGOs to better understand circumstances and vulnerabilities through a bottom-up approach has the potential to not only increase the effectiveness of public policies but strengthen the resilience of a community and foster

development that can withstand the impacts of climate change.

FILLING GAPS IN RESEARCH

The employment of a bottom-up approach by NGOs can assist in filling gaps in the current regime through the inclusion of experiential knowledge as well as evidence and analysis from stakeholders. As mentioned above, research has been primarily scientific within the international community, in terms of adaptation to and mitigation of climate change. Within academia, the relationship between climate change and human security has been analyzed and critiqued relentlessly through the use of methodologically-criticized case studies, theoretical approaches and quantitative analysis of a wide array of indicators.

In summation, theorists, scientists, researchers and academics have developed wide varieties of graphs, explanations, and theoretical relationships between human security and climate change. The reality is that human insecurity stemming from climate change will manifest differently within all populations, environments, and political and economic systems. Attempting to theorize what the effects and impacts will be is a starting point, but it is time to reach beyond theories as the impacts are already taking place. Neither an academic approach nor a solely scientific approach are sufficient "because they exclude the complexity of the interactions between nature and humans that can be neither modeled nor predicted."[46] A more holistic perspective is required. Citizen participation and stakeholder engagement can "provide new knowledge – in particular local knowledge – that is inaccessible to more abstract empirical methods."[47] Academic, scientific and stakeholder input are all necessary components to successful protection and empowerment of human security, but stakeholder input currently remains absent and lies within civil society.

NGOs focusing on conflict prevention, food security, water security or migration, to name a few areas impacted by climate change, can share qualitative, quantitative and experiential knowledge through a bottom-up approach. This can assist actors in determining what types of projects and policies have and have not been successful in addressing human security issues, to provide a case-by-case analysis of human security contexts, to serve as a liaison between policy-makers and stakeholders, and to be the voice of powerless vulnerable populations.

EMPHASIS ON PREVENTION

Lastly, and most importantly, civil society's emphasis on prevention is a necessary but an absent component in current dialogue. The impacts of climate change will not wait for the international community to find a solution or reach an agreement. Civil society's emphasis on prevention and early response is necessary in order for states to protect human security, now and in the future.

While states and international institutions have focused primarily on the protection component of the prevention-oriented feature of human security, NGOs collectively employ a dual focus on protection and empowerment. This involves mandates directed for protection, primarily of human rights, which entails promoting accountability for violations, increasing transparency, and monitoring and assessing policy implementation, among other roles. Mandates for empowerment stress the importance of development and capacity-building.

The inclusion of NGO approaches to prevention would emphasize early action to increase resilience and adaptation rather than the traditional reactive response, thereby resulting in a more cost-effective approach that encourages a comprehensive strategy for human security and fosters cooperation and information sharing. NGOs could also provide tools, best practices and experiences, expertise and information that states and international institutions are incapable of ascertaining.[48]

TOOLS AND EXPERTISE

Cooperation and experience, as well as emphasis on a bottom-up approach, have led to the development and improvement of a wide array of civil society tools for the protection of human security, of which many, if not all, are applicable to prevent the threats of climate change to human security. It has been found that "NGOs often have much better analytical and technical skills and capacity to respond more quickly than government officials." [49] Of course, this is dependent upon the resources and funding available to the NGO. In particular, there are two tools that should be considered vital to the protection of human security in the context of climate change including context/conflict assessments and crisis mapping, which will be reviewed in a later chapter.

IV. BRIDGING DIVERGENT APPROACHES

Human security is deeply engrained in the work of humanitarian NGOs through human development, which is synonymous with the empowerment aspect of human security, and human rights, which is synonymous with the protection aspect of human security. However, when the concept of human security entered international dialogue, it had already been well-established in the work of humanitarian NGOs. While there is not a "hierarchy" of human rights within civil society, the same disconnect between the empowerment and protection aspects of the human security concept that exist in state and international institutions are also present within civil society.

> In all this freedom from want suggests the provision of essential food, water and shelter, while freedom from fear suggests the absence of political violence and oppression. Climate change is now frequently discussed as a threat precisely

> because it may disrupt food supplies and through storms in particular directly endanger shelter and health too (Webersik 2010). Likewise there is very considerable literature that expresses concern that such disruptions will induce violent conflict, although the social science research suggests that much of this is alarmist (Kahl 2006), nonetheless security agencies are now frequently using such arguments in their analyses of potential future conflict.[50]

These two divergent approaches taken by NGOs are reflective of the top-down approach to protection and bottom-up approach to empowerment. As mentioned earlier, responsibility for prevention-oriented protection lies primarily with states to establish norms, processes and institutions to protect people from threats. NGOs employing a protection approach strive to increase accountability for state actions, compel leaders to implement policies for human protection, pressure violator states amidst other similar roles. Since there is a general consensus on civil and political rights and they are negative rights, NGOs saw an opportunity to interject themselves into the international dialogue and emphasize "sovereignty as responsibility," through which sovereignty is no longer conceptualized as a protection against interference but rather an obligation to protect their population. As a result, NGOs have approached the human security concept from two divergent paths: development and human rights.

While divergent approaches may have been beneficial in some regards, climate change is an unprecedented threat to both protection and development. When analyzing the human security implications of climate change, all aspects of human security are interdependent. The impacts of climate change on human security straddle the divide between the two approaches, as a force that will negatively impact current and past development projects, especially those focused on hunger, poverty, health, livelihood, and migration, and that could result in a threat to human survival, both due to conflict and physical health, as well as enjoyment of basic human rights.

Empowerment and protection are mutually reinforcing aspects of human insecurity prevention. Human rights are fundamental to development and development is a key to prevention of human rights violations. Development that does not account for the future impacts of climate change could result in human protection being compromised or could "undo decades of development efforts," as stated by the World Bank Group in 2003. Both development and protection are fundamental to human security, especially when addressing climate change threats.

The human development and human protection components of human security are not only complementary, but have overlapping concerns in terms of climate change. Humanitarian NGOs that employ divergent approaches to human security must realize that climate change poses a threat to both human protection and human development or preventive efforts will remain fruitless and a time will come when prevention is a lost cause.

A brief analysis of the primary concerns of human development and human protection NGOs sheds light on overlapping concerns, which can serve to merge the human development and human protection components within civil society.

IDENTIFYING OVERLAPPING CLIMATE CHANGE CONCERNS OF THE TWO APPROACHES TO HUMAN SECURITY

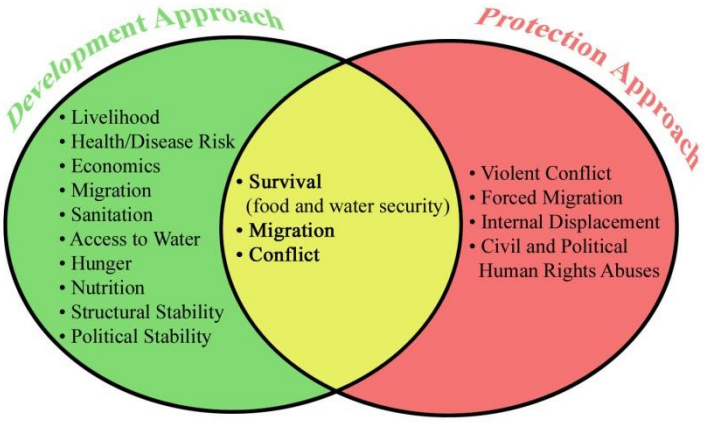

FIGURE 1: OVERLAPPING CONCERNS OF TWO APPROACHES TO HUMAN SECURITY *(CREATED BY AUTHOR)*

Although the concerns of development organizations stretch beyond the factors listed above, the concerns of protection organizations tend to be specific. There are three primary concerns stemming from climate change that both protection and development organizations have routinely focused on in the past: survival (or life), migration and conflict. When development and protection organizations can collaborate to address the survival, migration and conflict implications of climate change, not only will they be acting preventively, but they will have more power to do so in light of cooperation and shared resources and knowledge.

Human survival is threatened by the negative impacts of climate change on the most basic levels: life-sustaining resources such as food and water. most basically by negative impacts of climate change on life-sustaining resources- food and water, which are intrinsic to survival. Increased temperatures, heavy precipitation events, warm spells and heat waves, droughts and sea level rise will each have a distinct negative impact on these resources. Additionally, external factors, such as growing populations, increased economic demand for natural resources and degradation of water sources from human activities, will add further pressures to already stressed systems.

One of the primary means by which populations cope with threats to survival is through migration. Climate change is driving and will continue to drive migration, whether it is historical migration, forced migration, internal displacement, cross-border migration or urbanization. Migration, in all its forms, will have additional implications

for stability, primarily by increasing stresses on societal divides and infrastructure. In addition, population movements, coupled with expected population growth, can serve to further exacerbate food and water insecurity or instability.

Food insecurity, water insecurity and migration can all serve as contributing factors to violent conflict, whether small scale, intrastate or interstate. Quantitative and analytical studies have continuously attempted to prove and disprove relationships between the environment and conflict. While the relationship is still unclear, when looking at solely small scale conflicts within sub-Saharan Africa, environmental factors, whether it be access to drinkable water, rights to land upon which people are dependent for their livelihood or migration due to land degradation, it is clear that the environment can play a contributing role to violent conflict, at least at the local level. The growing impact of climate change will only exacerbate these tensions.

In order to understand why and how a comprehensive conceptualization of human security is necessary within civil society, the following section will analyze the impacts of climate change on overlapping concerns of human development and human protection NGOs.

CLIMATE CHANGE IMPLICATIONS FOR OVERLAPPING HUMAN SECURITY CONCERNS

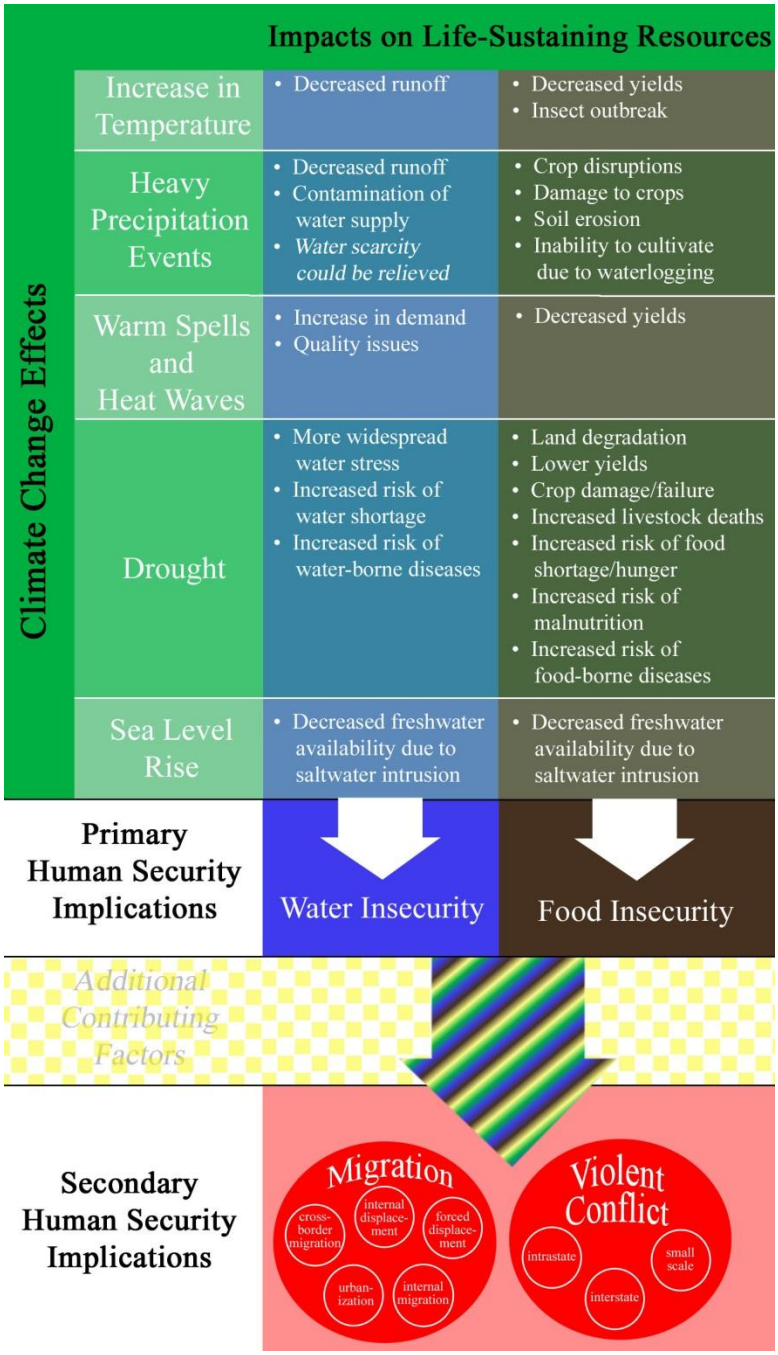

FIGURE 2: CLIMATE CHANGE IMPLICATIONS FOR OVERLAPPING HUMAN SECURITY CONCERNS
(CREATED BY AUTHOR; RESOURCE FOR CLIMATE CHANGE EFFECTS: IPCC WGII 9.4, 2007)

V. DECONSTRUCTING PREVENTION: CIVIL SOCIETY TOOLS TO TRANSFORM RHETORIC INTO REALITY

The implications of climate change are stark and the international community's failure to address human security threats is nothing short of immoral. The world continues to globalize but the concept of the "international community" has failed to adjust at the same rate. A world once dominated by states and international institutions must now adjust to the reality that international, regional, national, sub-national and local civil society organizations as well as private sector actors are all dynamic components of international relations. This recent reality can either be harnessed to make prevention of human insecurity attainable, or can be ignored to later face the ever-mounting consequences of inaction.

If civil society is able to converge the components of human security in the face of climate change and interject human security concerns into the climate change dialogue, a cooperation-based approach can be taken to address human insecurities stemming from climate change. Cooperation allows for the tools, resources and expertise of all global actors to be employed, fosters information sharing and best practices, and opens the door to the implementation of effective adaptation and preventive measures before it is too late.

Among the vast selection of tools within civil society, two tools in particular will play a vital role in the prevention of human insecurity and timely and efficient reaction to crises, in cases in which preventive efforts failed or never existed.

PREVENTIVE V REACTIVE RESPONSES TO CLIMATE CHANGE IMPLICATIONS

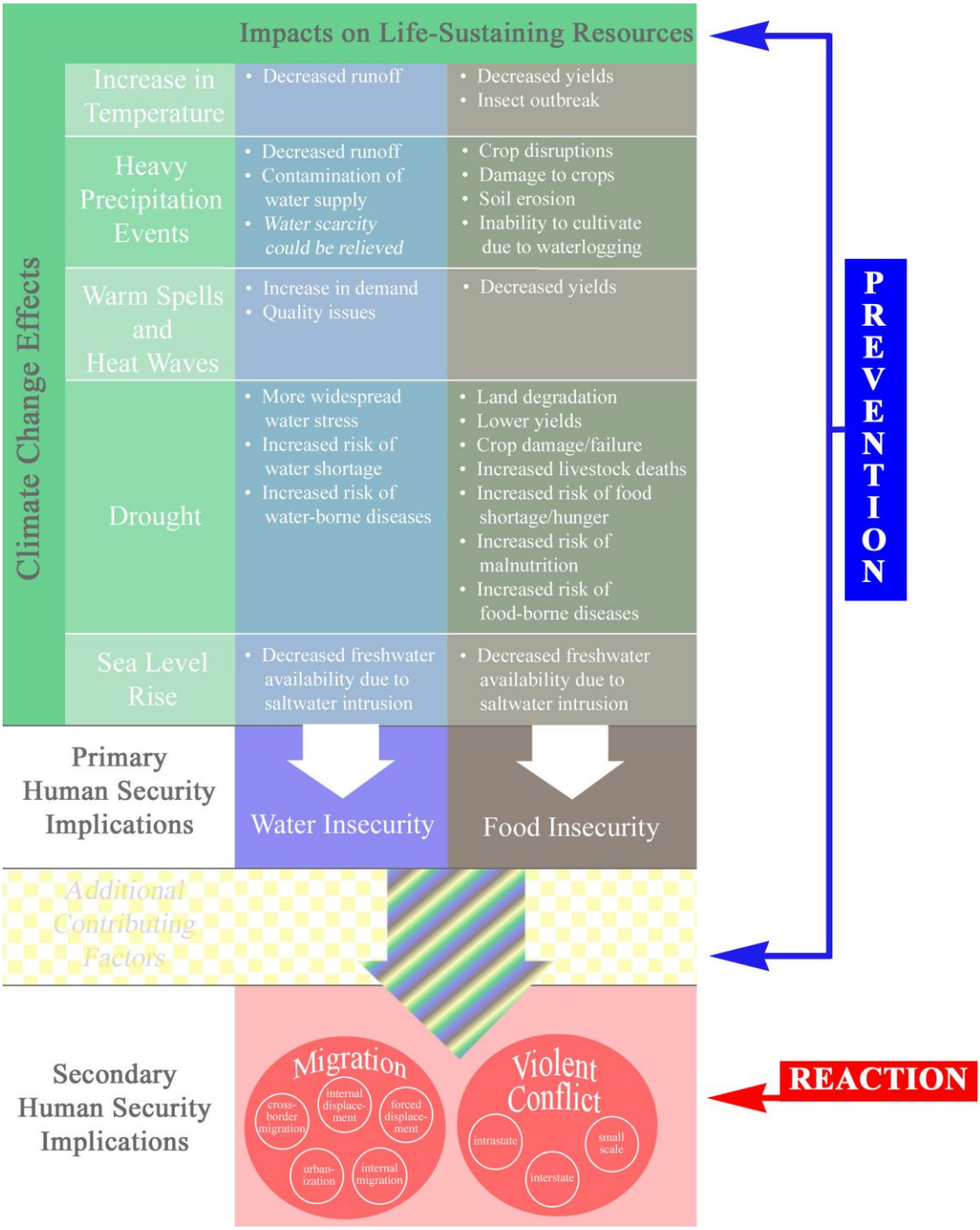

FIGURE 3: PREVENTIVE V REACTIVE RESPONSES TO CLIMATE CHANGE IMPLICATIONS
(CREATED BY AUTHOR; RESOURCE FOR CLIMATE CHANGE EFFECTS: IPCC WGII 9.4, 2007)

PREVENTIVE CRISIS MAPPING

Tools that were once incredibly expensive and only available to a small number of professionals have entered the field of humanitarian assistance in the past decade. The rise of citizen journalism, social media and advanced technologies has facilitated information sharing on an unprecedented scale, resulting in the current generation of crisis mapping, which allows NGOs to gather data on unfolding crises. Such essential data can increase the timeliness of a response and target humanitarian aid and assistance as well as project implementation.

While a few notable organizations have been able to harness this technology, "there is also evidence that current humanitarian practice has not been able to take advantage of the new technologies and partnerships offered by the network age to share, manage, understand and then act on information in an effective and timely way."[51] For example, in 2011, early warning signs of famine in the Horn of Africa did not allow sufficient time for effective action, resulting in thousands of avoidable deaths.[52] One of the prominent issues was a lack of information sharing, thereby posing "a significant barrier to response and to partnership."[53]

In order to stay relevant and strengthen preventive efforts to the best of their ability, humanitarian organizations must adapt to the changes in technology, "to the increasing volume and complexity of information in the network age, and to the many new actors involved in using that information."[54] One of these new actors happens to be the private sector, which has not only utilized crisis mapping, but has been one of the leaders in its advancement. Palantir, a software company composed of primarily engineers, was founded with the purpose of assisting organizations with data and analysis for humanitarian causes and, simply, "to make the world a better place."[55] Additional actors include regional organizations, localized civil society in the form of associations, local groups, or a collection of people with an interest, academic circles, and the media, amongst others.

Advanced technologies, one of which is crisis mapping, have rendered the traditional meaning of "humanitarian assistance" irrelevant. What once referred to "a small group of established international organizations, often based in or funded by high-income countries providing help to people in a major crisis" is now an outdated view.[56] Rather, crisis response now consists of a decentralized global system of citizens, organizations, states and international institutions.

Each of these developments is not only relevant to the protection of human security but is a necessary component of prevention. Effective information sharing and mapping of insecurity levels can assist NGOs, governments and other actors to target international aid, implement adaptation measures, track forced environmental migration and provide warning signs of a crisis.

STATE-LEVEL ANALYSIS

Mapping takes many different forms and serves many different purposes. At a state-level, mapping data can assist to identify countries that will be most affected by and are most vulnerable to the impacts of climate change, primarily through the analysis of scientific data and development indicators.

David Wheeler, Senior Fellow at the Center for Global Development, published a working paper on "Quantifying Vulnerability to Climate Change: Implications for Adaptation Assistance," in which he developed a data set for the physical impacts of climate change on each country and their vulnerability, or ability to cope with the changes. Wheeler first analyzed the direct state-level risks for agricultural production loss, extreme weather and rising sea level. He then incorporated data to account for the country's ability to cope with those climatic changes and his analysis revealed that Africa would be disproportionately vulnerable.[57]

The findings of Wheeler reflect those of the IPCC, which determined, based on numerous studies, that Africa is "one of the most vulnerable continents because of the range of projected impacts, multiple stresses and low adaptive capacity."[58] Predictions made by the IPCC regarding *regional* patterns and impacts of climate change are made with greater confidence, and can therefore better identify particularly vulnerable systems, sectors and regions.[59]

Within Africa, the primary physical effects of climate change include droughts, warm spells and heat waves, a rising sea level, higher temperatures, and heavy precipitation events. Each of these effects will negatively impact food and water insecurity. Unfortunately, the current state of water and food security in Africa does not provide for a promising outlook in the face of climate change.

The IPCC predicted with high confidence in 2007 that by 2020, just seven years from now, 75 to 250 million Africans will be exposed to increased water stress, and yields from rain-fed agriculture, a primary source of food for many rural communities in sub-Saharan African, could be reduced by up to 50%, adversely affecting food security and exacerbating malnutrition. Approaching the end of the 21st century, sea level rise will affect low-lying coastal areas with large populations, for which the cost of adaptation could amount to at least 5-10% of GDP.[60] These predictions are likely to occur whether or not states reach an agreement to reduce GHG emissions for a second commitment period within the UNFCCC.

As of 2010, Africa was the only region in which a majority of countries had less than 75% of the population using improved drinking water sources. Six out of the seven countries worldwide with less than 50% improved sources of water were sub-Saharan African countries: Niger, Somalia, Ethiopia, the Democratic Republic of Congo, Mozambique and Madagascar.[61] Although Millennium Development Goal (MDG) 7, which is to "halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation," was the first goal to be achieved on a global scale,

averaging the achievements of all countries. When broken down by region, only 61% of the total population of sub-Saharan Africa use improved water sources.[62]

The second component of MDG7 is to increase the percentage of the population using improved sanitation facilities. As of 2010, only 31% of the population used improved sanitation facilities, 23% in rural areas and 42% in urban. A lack of sanitation facilities is one of the primary contributors to "unimproved" drinking water sources. Of course, this is not necessarily due entirely to a lack of initiatives- economic, political and social factors must be considered as well. In terms of water resources, attention has been brought to the discrepancies between rural and urban access to drinking water, highlighting varying vulnerabilities of sub-state populations.

Populations residing in rural areas tend to have a higher poverty rate and a lower rate of access to improved drinking-water sources. Currently, more than eight out of ten people worldwide who do not use improved drinking-water source live in rural areas.[63] Within sub-Saharan Africa, more than 70% of impoverished people reside in rural areas and the region also has the highest incidence of extreme rural poverty.[64] Nearly 85% of the sub-Saharan population without improved drinking-water sources resides in rural areas. Figure 6 illustrates the magnitude of the gap between urban and rural access to drinking water: 64% of the total population resides in rural areas yet only 49% of rural populations have improved drinking-water sources.

RURAL VS. URBAN IMPROVED DRINKING WATER ACCESS
(% OF TOTAL POPULATION)

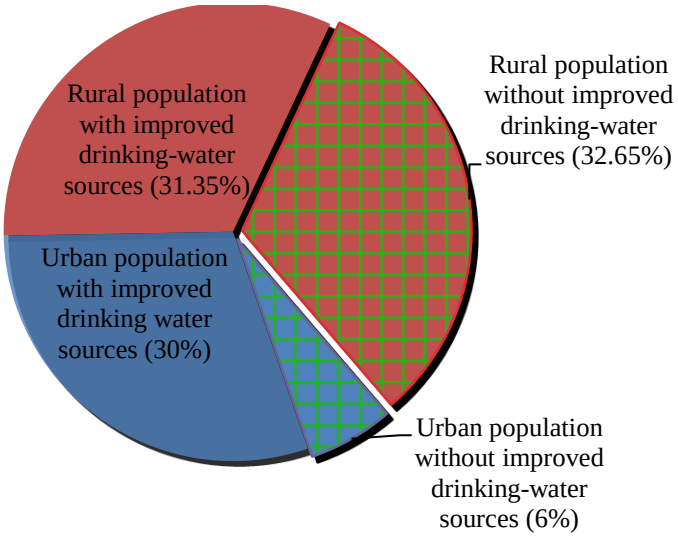

FIGURE 4: RURAL VS. URBAN IMPROVED DRINKING-WATER ACCESS
(WORLD BANK, 2010)

With an estimated 40% of the population of sub-Saharan Africa lacking improved drinking-water sources and an increased demand for water resources in recent decades due to a growing population, climate change is expected to further exacerbate water insecurity. The Food and Agriculture Organization (FAO) has predicted that in just 12

years, 1.8 billion people will be living in countries or regions with "absolute" water scarcity, and two thirds of the populations will be under "stress" conditions.[65] When accounting for population growth, it has been predicted that .4 to 1.7 billion Africans alone will experience increased water stress, and by 2050, that number will reach between 1 and 2.7 billion.[66]

SPATIAL DATA ANALYSIS

It is clear that vulnerabilities may vary within a state and even from community to community. Therefore, a state-level analysis is not adequate as it generalizes a population that may have groups at opposing ends of a security spectrum. Spatial data has been a progressive step towards pin-pointing vulnerabilities. In 2010, a study entitled "Global threats to human security and river biodiversity," used scientific spatial data to identify populations at risk of water insecurity. The authors aimed to provide a worldwide synthesis with the goal of "prioritizing policy and management responses to the [water security] crisis."[67]

The 2010 study, "Global Threats to Human Water Security and River Biodiversity," is an example of how spatial data can be incorporated into the human security approach to climate change. For NGOs or states that wish to implement development projects focused on water security, this data can help to identify a starting point.

However, this analysis was based primarily upon scientific data. While that is a necessary component, it fails to consider community resilience, thereby excluding vital components: whether or not the community actually reports that they suffering from water insecurity, if successful adaptation has taken place or if there are economic barriers to security, to name a few. It should be mentioned that this was not the intention of authors and therefore not a flaw. Rather, in order for a spatial analysis such as this to be used for effective prevention, further steps are necessary.

Water insecurity is closely linked to food insecurity. The sub-Saharan African region is particularly vulnerable to climate change because of the widespread dependence on rain-fed agriculture for sustenance - comprised of 96% of the population - and for livelihood - comprised of 70% of the rural workforce.[68] As a result of the bleak state of food security in sub-Saharan Africa, researchers and organizations have begun to map sub-state data to identify internal vulnerabilities and increase the accuracy of data. This will be a necessary component in addressing insecurities as internal vulnerabilities can be drastically divergent.

Already, about 25% of the world's degraded land is in Africa.[69] Although agricultural production has increased in recent years, the environmental toll has been severe, due in part to poor water and soil resources, the lack of fertilizer, seeds and irrigation technologies, and regressive policies that result in degradation or support

unsustainable resource use. In addition, increased production has not compensated for the growing population. Per capita agricultural output is only 56% of the world average.

Undernourishment and hunger still run rampant throughout sub-Saharan Africa despite the Millennium Development Goal 1 to eradicate extreme poverty and hunger. Since 1990, the percent of undernourished people in sub-Saharan Africa has only decreased by 4% and the absolute number of underweight children has risen steadily for the past twelve years, due in part to a growing population. Per capita consumption has progressively decreased over the past few years and would be even lower without food imports.[70]

Events throughout recent years, including the financial crisis, spike in food prices in 2008 and droughts, have driven more people into poverty and hunger.[71] In 2007 and 2008, a food price crisis arose as a result of droughts in grain-producing countries and rising oil prices. Within just two years, from 2006-2008, average world prices for rice rose by 217%, wheat by 136%, corn by 125% and soybeans by 107%. As a result, global progress towards achieving MDG1 has "slowed and leveled off" since 2007-2008.[72]

Nearly four years later, in 2012, Maplecroft's Food Security Risk Index revealed that of the 197 countries surveyed worldwide, 30 of the 59 most at risk for food insecurity were sub-Saharan African states. Maplecroft warned that low crop yields had pushed global food prices up by 6% in July 2012, adding to the concern of a repeat of the 2007-2008 food crisis. Nine of the eleven countries at "extreme risk," the highest rank, were in Africa, including Somalia and the Democratic Republic of Congo, which were ranked together in first, Burundi (4^{th}), Chad (5^{th}), Ethiopia (6^{th}), Eritrea (7^{th}), South Sudan (9^{th}), Comoros (10^{th}) and Sierra Leone (11^{th}). Aside from drought, sources of food insecurity included rising prices and declining production of corn from the United States and other countries, as well as conflict and instability. The concern of another major food crisis in Africa has been echoed by the UN as well.

The impacts of climate change will pose another barrier to development in sub-Saharan Africa. An increase in erratic weather patterns and continued land degradation will negatively affect crop yields. By 2020, it is expected that yields from rain-fed agriculture could be reduced up to 50% in some sub-Saharan African countries.[73] This will have particularly adverse effects on smallholder farmers, most of which are located in rural communities and provide the vast majority of agricultural production.[74] Overall, land suitable for agriculture will be reduced by 6%, thereby by decreasing GDP by 9%.[75] A rural-urban divide, similar to that in water insecurity, has already begun to appear in levels of food insecurity.

SUB-STATE LEVEL SPATIAL DATA ANALYSIS

Sub-state level analysis begins to put mapping on track towards greater accuracy. In an attempt to understand sub-state vulnerabilities, Olivia Grimm and Albrechy Ehrensperger from the Centre for Development and Environment, and Boniface Kiteme

from the Centre for Training and Research in ASAL Development, gathered data and used a bottom-up approach through consultation with stakeholders to identify sub-national levels and drivers of food insecurity. Their findings confirmed that state-level or global analysis is not accurate because "reasons for food insecurity are multidimensional and not always related to the volume of food production or the consumer prices of food items." Therefore, it is necessary to understand the levels and drivers of food security at a sub-national level since they vary from community to community.[76] They found that the drivers of food insecurity and mitigation techniques are "highly context specific."[77]

Two of the most notable and beneficial components of this study are the attempted use of a bottom-up approach, by engaging stakeholders through interviews and group discussions, and the inclusion of cross-disciplinary experts. Five European, three African and two Central American institutions collaborated on this study, and individual contributors included professionals from environmental, political, economic sciences, geography, agronomy and engineering disciplines.[78]

Similar data mapping is performed on a regular basis by The Famine Early Warning Systems Network (FEWS NET), creating one of the most progressive approaches to food security. FEWS NET has staff members in numerous Africa countries who are the "eyes and ears" of the project and collect and analyze data as well as travel and work in the field to keep up to date with the current situation. Data is updated monthly for countries at great risk of famine, and usually updated at least quarterly for most countries in which FEWS NET operates. Data is released in a public report for use by policy-makers all over the world.

Of course, there are ways in which both of these methods of data and information gathering could be improved to ensure a bottom-up approach. Much of the information used by FEWS NET is quantitative, which may be due in part to the frequency of data gathering, a limited number of individuals on the ground or other factors. In order for this to be updated for the use of tracking human insecurity stemming from climate change, additional qualitative data would be necessary to better identify the specific needs of communities or drivers of food insecurity.

Grimm, Ehrensperger and Kiteme could have performed interviews and group discussions. Although they engaged local individuals, this consisted primarily of "rural advisers or officers from irrigation, agriculture, gender and social development offices at the district level," and therefore does not necessarily represent the population. While it is a daunting and difficult task to reach beyond political or community leaders, it is essential in many circumstances as it cannot be guaranteed that officials represent the thoughts, ideas and sentiment of individuals or groups within the community. Additionally, a cross-disciplinary approach is beneficial, but in this case, failed to include civil society or development professionals, both of which play a key role in food security.

Despite gaps in methodology, studies such as these are essential to preventing food and water insecurity. Next steps would include the creation of a centralized

database, cooperative participation from NGOs to report on insecurities, development of reporting mechanisms for individuals currently without access to the Internet or mobile devices, and partnerships with a team similar to a SBTF that has the capability to spatially map and analyze the data.

REAL TIME DATA

To date, the most advanced crisis mapping initiative on climate change is the Climate Change and African Political Stability Program (CCAPS), developed by the Robert S. Strauss Center for International Security and Law at the University of Texas at Austin in partnership with AidData. The mapping tool enables users to "visualize data on climate change vulnerability, conflict, and aid, and to analyze how these issues intersect in Africa." For example, different layers of data allow you to visualize how conflict patterns could exacerbate insecurity in a region vulnerable to climate change or see how conflict has shifted over time. It also provides data on aid-funded interventions, which has the possibility of providing insight into whether or not development assistance is effectively reducing vulnerability. This tool was a breakthrough in the field and sets the groundwork for the road ahead. Adopting a tool such as this for application on a greater scale has the potential to drastically strengthen preventive efforts.

The map below includes a base layer with spatial data for climate vulnerability, which incorporates physical exposure to climate-related hazards, population density, household and community resilience and governance and political violence. The red markers map the Armed Conflict Location and Events Dataset (ACLED), which is updated on a monthly-basis and includes location, date, actors for fatalities from battle events, transfers of military control, headquarter establishment, civilian violence, and rioting. Lastly, black markers identify aid projects in place using data from the Malawi Aid Management Platform, the World Bank.

The map allows for a large-scale view but also a sub-state view with relatively accurate mapping of data. However, its purpose is primarily to identify conflict patterns and their relationship to climate change-based vulnerability. In addition, aid data is only available for certain years and is not available for years after 2010.

A mapping tool for the prevention of human insecurity would have to be a centralized and coordinated effort within civil society. There are also many new technologies that could assist in providing up-to-date data and information. Improvements would need to include more extensive and timely data as well as cooperation with a wider variety of actors. Just over the past five tears, a breakthrough in real time data collection was made, now termed "crowdsourcing."

CROWDSOURCING

Natural Language Processing (NLP), which aggregates data and information from news and social media outlets to provide collective data about an unfolding crisis, was

the first monumental merge between Geographic Information Systems (GIS), which map geo-spatial data, and social media and the internet. A few years later, in 2008, crowdsourcing was introduced to gather information from the ground and is now "primarily [used as] a tool for agencies to decide how to help people, [and] it must be understood as a product, or service, to help affected communities *determine their own priorities*."[79] Crowdsourcing takes two forms: (1) information is aggregated directly from affected communities; (2) data and information is outsourced to volunteers at a location outside of the affected community.[80] Crowdsourcing has been used primarily for disaster response.

As post-election violence began to unfold in Kenya in 2008, a mapping platform called Ushahidi was set up by Patrick Meier, who is now a lead figure in the field of crisis mapping. Ushahidi is an free, open-source platform that can be viewed by anyone across the world to give them access to data and information in the form of a spatial map. The original use of Ushahidi in Kenya was to crowdsource reports of violence and map it in real time. People in Kenya had the option to fill out an online form to describe the events that they were seeing or send a text message via standard messaging services (SMS), to report violence. The Ushahidi platform has since evolved and as a crisis unfolds, volunteers assemble to form a Standby Volunteer Task Force (SBTF) and gather messages, photos, videos and satellite imagery to map on the Ushahidi platform. These volunteers form a decentralized network located all over the world that mobilize when a crisis occurs. In preparation for the 2013 Kenyan elections, the Uchaguzi platform was established to promote a "free, fair, peaceful and credible election process." Reports were gathered via SMS, Twitter, through the use of the "#uchaguzi" hash tag, Facebook, email, and the web-based platform. Data and information was mapped in real time by a SBTF and transmitted to volunteers and election monitors on the ground in Kenya to verify reports and monitor incidents of violence, fraud or other disruptions. The initiative engaged local civil society, official NGOs, governments and local election monitoring groups and gathered information through both forms of crowdsourcing. The Ushahidi platform has since been used by other organizations on a smaller scale to track reports of rape in a country, track human trafficking and other humanitarian issues.

More recently, crowdsourcing has taken new forms. An example is a map that gathered data from Twitter to evaluate the "potential of Twitter as a source of time-stamped, geocoded public opinion data in the context of the recent popular uprising in the Middle East." Todd Mostak created this database to perform real-time analysis and visualization of certain Twitter tags. This is now being made into a public web interface called "Tweetmap" in collaboration with Ben Lewis who heads the WorldMap Initiative at Harvard's Center for Geographic Analysis. Todd Mostak has also already used his Tweetmap for live crisis mapping. Meier responded to the creation of this map by exploring whether or not socio-economic trends, such as poverty and unemployment, can be captured via Twitter.

Following extensive research on the emerging field of crisis mapping, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) came to conclusion that "The most appropriate and effective systems are typically those that draw upon technologies that are already common in a country, and ones the people from all walks of life are familiar with," which tend to be low-cost and easy to use technologies. The establishment of FreedomFone, a system that collects data through voice over the phone, has been found to be useful in areas of low literacy. This tailoring of digital tools to local contexts "increase[es] the ability of technologies to be participatory and increase[es] local ownership," as stated by the UNDP.[81]

REACTIVE CRISIS MAPPING

Crowdsourcing is the key to effectiveness and efficiency in the current model of crisis mapping. It allows for real time analysis and employs a bottom-up approach, supporting the fact that "communities know best what works for them," as stated by OCHA.

As of 2012, African countries that are expected to face the brunt of global climate change constituted more than half of the top 14 countries ranked on the Failed State Index as the most instable or on the brink of failure.[82] Added instabilities of food and water scarcity will only exacerbate current situations, and are likely to result in secondary impacts including migration and, in certain circumstances, violent conflict.

If employed properly, crisis mapping has the potential to map migration patterns stemming from climate change. This can assist NGOs in accurately targeting humanitarian aid in a timely manner to communities and cities unable to meet the needs of a large-scale influx of migrants, and can identify common patterns of migration to assist NGOs in efficiently implementing development and resilience projects in communities and cities expected to grow in population size.

MIGRATION

Migration will be a severe consequence of climate change and the international community must be prepared for changes in migration patterns. The IPCC stated that the single greatest impact of climate change would be on human migration induced by both *climate processes,* which tend to be slow-onset processes such as sea-level rise, desertification or increased water scarcity, and *climate events*, such as flooding and hurricanes.[83] The most widely accepted prediction of migration induced by climate change was proposed by Professor Norman Myers of Oxford University, who stated that there would be 200 million climate migrants by 2050. However, all estimates admit that predictions are unclear and unpredictable. "The history of migration literature as a whole shows that theoretical positions come and go with as much regularity as the population flows themselves."[84]

Currently there are no international mechanisms, processes or legal documents that address the issue of climate-induced migration. In fact, there is not even an agreed-

upon term for this form of migration. According to the International Organization for Migration (IOM), "environmental migrants" are:

> persons or groups of persons, who, for compelling reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or chose to do so, either temporarily or permanently, and who move either within their country or abroad.[85]

Currently, there is an ongoing debate on the issue of how to classify population movement associated with the environment. Many academics have used the term "environmental refugee" to express the urgency of environmentally-induced migration. However, migration on the bases of environmental drivers does not fall within the international legal definition of "refugee" and it is unlikely that it will ever be accepted as such by states and international institutions due to its ambiguity and the prioritization of political and civil rights. That does not mean it is not an urgent issue, but is an unprecedented form of migration that will not be as noticeable as typical patterns because climate change is a slow process but will result in the same magnitude of migration as sudden-onset crisis in the long-term.

While climate migrants do not fit within the refugee category, per say, they also do not fit within the traditional definition of migrants. Historically, many populations, especially rural or pastoral communities, have considered seasonal or temporary migration to be a regular event. However, this entails the ability to return to the place of origin. As the impacts of climate change strengthen, land degradation may prevent populations from returning. A study on migration triggered by drought in Somalia published by The Institute for Sustainable Development and International Relations and IOM entitled "The State of Environmental Migration 2011," shed light on numerous factors constraining migration, including growing population in rural areas, competition for land and water, ecological damage to resources and restricted mobility across political boundaries."[86] This has led to the introduction of the term "forced" environmental migrant, to emphasize the fact that the migrant has no other choice but to migrate in order to survive or sustain their livelihood, which is usually a basis for survival. Forced migration emphasizes the roll of "push factors," including environmental degradation, water and food scarcity or a threatened livelihood to name a few, which the IOM has argued are the main contribution to a migrants decision to flee. "Pull factors are of course a component, but it is likely that they would not flee simply because of pull factors," which are primarily economic factors.[87]

In support of this, case studies have found that in many instances most individuals are not interested in leaving their community unless it isas a last resort, and they would return if possible. Traditionally, seasonal migration allows for populations to return.

Within sub-Saharan Africa and other developing countries, these migratory shifts will likely take place within national borders. In the context of the disproportionate vulnerability of impoverished and rural populations, it is expected that "increased food and water scarcity due to climate change in rural areas will accelerate the dramatic rural-urban shift in the developing world."[88] The internal characteristic of forced climate migration is due primarily to economic constraints, as it "typically requires access to money, family networks and contacts in the destination country."[89]

This urban shift will have consequences of its own, many of which will be similar to the primary impacts of climate change; food and water insecurity. Currently, about one third of the developing world's population, 1 billion people, lives in urban slums with a lack of clean drinking-water sources, sanitation and other health, educational and social services.[90] Climate change combined with regular migration patterns is expected to result in this number rising to 1.7 billion by 2030. With an influx of people into already unstable or unhealthy environments and weak infrastructure, conditions should only be expected to worsen.[91] "Over the short term, climate change forced migration will make the Millennium Development Goals harder to achieve. Over the long term, large-scale climate change migration could roll back much of the progress that has been made so far."[92] Unfortunately, without proper preventive measures, forced climate migration will likely feed a cyclic pattern between environmental degradation and migration.

Many of these shifts will be inevitable over time, however crisis mapping and data analysis can play a vital role in addressing migration. More recently, new crowdsourcing techniques have been successfully tested that pave the way in the future of crisis mapping, most notably by Flowminder, a company that has uses location data from mobile phones to visualize and predict population movements after major disasters. After the 2010 earthquake in Haiti, Flowminder analyzed the movement of 1.9 million mobile phone users by comparing population locations before and after the earthquake. Remarkably, the predictability of population movements remained high and increased during the three-month period after the earthquake[93] "The findings suggest that population movements may be significantly more predictable than previously thought," Linus Bengtsson and Xin Lu, co-founders of Flowminder, as well as Petter Holme, a colleague of the co-founders, stated in their report on predicting populations after the earthquake.[94] Satellite imagery has also been used to track population movements, although not as accurately. For example, in 2011, a SBTF partnered with UNHCR and Tomnod in Somalia to scan satellite imagery and tag over a quarter of a million features that looked like shelters of internally displaced persons (IDPs). This was completed within just 5 days.[95]

Tracking migration patterns in early stages of climate change-induced crises can help to identify rural and urban areas with the greatest population influx. This provides guidance to NGOs when determining where to target aid or implement development

projects. NGOs can assist in preparing urban infrastructure for increased population growth in order to prevent increased or exacerbated food and water insecurity.

A tracking system as robust as Flowminder is a worthy goal, but previous generations of crowdsourcing can also serve as a starting point. This would involve gathering information from local individuals, groups, and NGO's as well as sub-national actors, via reports, SMS, or social media outlets and map the collected data. Sources could report noticeable out- or in-migration, whether slow patterns or mass movement. This would allow NGOs to investigate reasons for migration and target aid to primary migration destinations.

Additionally, in cases of extreme climate events, such as floods or droughts that result in sudden-onset migration, crisis mapping platforms, similar to Ushahidi, can assist NGOs, governments and international institutions in targeting humanitarian relief and aid.

Crisis mapping and data analysis remains a new and developing field within the humanitarian context, and has plenty of room for growth and improvement. There are particular risks to accuracy and effectiveness, one of which is participation bias in crowdsourcing. This can be due to varied availability of reporting mechanisms or societal divides within a country. It is estimated that 70% of the African population have mobile phone subscriptions and there was a significant increase in cellular penetration in the top 20 countries that receive international humanitarian assistance.[96] However, it must be taken into account that subscriptions may be unevenly distributed amongst societal divides, such as economic or geographical differences.

Participation bias can also stem from societal structures, such as gender inequalities. In addition, internet penetration is incredibly low, with only 13% of the population having access to internet in 2011.[97] Additional risks that have been discussed by practitioners and are now being addressed include information overload, unmet expectations, unverified data, and privacy concerns regarding public data, particularly for fear of retribution violence.

Increasing access to reporting mechanisms, developing initiatives for improved access or identifying alternative modes of reporting are steps that NGOs, governments or the private sector can take as a first step in prevention of human insecurity. Communities are capable of monitoring local hazards and vulnerabilities, which is information that can assist other actors if it properly collected. New technologies, such as crisis mapping, can "provide key conflict prevention actors…with a level of localized information not previously available."[98]

A vital component to this strategy is context assessment, a method used by humanitarian organizations to ensure a bottom-up and conflict-sensitive approach through stakeholder engagement when implementing projects and initiatives or delivering aid. As Patrick Meier stated, "the frontline of humanitarian action has *always* consisted of communities helping themselves before outside aid arrives."[99]

CONFLICT ASSESSMENTS

Large-scale population movements have the possibility of increasing instability and are recognized by the UN Security Council as a "threat to international peace and security," particularly if there are already ethnic and social tensions.[100] The IOM has stated that forced climate migration "will redraw the ethnic map of many countries, bringing previously separate groups into close proximity with each other and in competition for the same resources."[101] This is just one of the many means through which climate change could lead to violent conflict on a small or large scale.

Researchers, academics, governments and international actors have explored the relationship between the environment and violent conflict for many decades in hope of reaching greater understanding and increasing prevention. Theory and research on this relationship has been discussed through four different scientific perspectives; determinist, empiricist, skeptics and deniers. Determinists claim that climate change will lead to wars.[102] Empiricists stress that climate change has and will contribute to forced migration and small-scale violence.[103] Skeptics simply debate and point to a lack of evidence in peer-reviewed and quantitative literature.[104] And, deniers challenge the links between climate change and security threats, claiming that it is a concern of development rather than security. Unfortunately, not one of these perspectives accurately analyzes the impacts of climate change.

Since the beginning of conflict prevention theory, researchers have identified and disproved links between different factors over and over again with no one theory being entirely correct because there is no formula to the outbreak of conflict. While all of these developments have helped to shoulder progress in conflict prevention, none have provided the answer to the question they were out to solve; how can we predict and prevent conflict? Attempting to theorize if and how environmental factors contribute to conflict is a starting point, but it is time to reach beyond theories. Ultimately, only one reality exists- that human insecurity stemming from climate change will manifest differently within all populations, environments, and political and economic systems.

In the past year, reports from the ground have led many researchers and academics to believe that "adaptation may be more of a cause of conflict than climate change itself," as stated by Simon Dalby during an interview for this paper.[105] This seems to be a repeated theme. Steven Heywood, who formerly worked at the Quaker United Nations Office in Geneva to study the relationship between water resources and conflict, reiterated this relationship.

> I think there is a possibility of adaptation and mitigation measures leading to an increase in tension and conflict, if they are done with largely commercial or monetary motivations and fail to take into account the needs of local people in the areas where adaptation and mitigation projects are taking place.[106]

One of the most noted cases to date is reviewed by Prosper Matondi, Kjell Havnevik and Atakilte Beyene in their book, "Biofuels, Land Grabbing and Food Security in Africa." The introduction of biofuel production was originally seen a climate-friendly form of mitigation and adaptation as it has energy and environmental benefits through reducing dependence on GHG-producing oil. However, biofuels have also led to "land grabbing," also termed "climate colonization," in which primarily commercial or state actors rush for control of African land. "Contemporary land grabbing is shrouded in similar attitudes about unexplored, underutilized and uninhabited African land. This echoes in a subtle way the past colonization of Africa. Worse in the current context, however, is the existence of willing participants on the African side who negotiate concessions for foreign interests under a veil of secrecy, and often in alliance with domestic actors."[107] Other motives have included economic development from foreign investment. However, the theory that there are large amounts of land in Africa that are underutilized or not utilized at all is a mistaken perception. Rather, as was stressed earlier in this paper, arable and irrigable land is limited due to climate change and environmental degradation.

The negative effects of biofuel production lies primarily with rural and agro-pastoral communities, a group also disproportionately vulnerable to the impacts of climate changes. One of the many issues that have been made clear with increased land grabbing is a failure to include stakeholders in the process. The authors cite the push for production of biofuels in Ethiopia as originating "primarily with global demand and the private sector, and not with local or rural needs."[108] In Tanzania, numerous land grabs have resulted in the displacement of farmers. Most of these land grabs take place in rural communities, in which a large majority of the population is dependent upon their own land for the production of food. In the case of Ethiopia, it is clear that a "major shortcoming of the current policies and strategies that promote biofuels is that they are not framed in relation to rural development and the livelihood needs of the rural areas."[109] Rather large-scale adaptation measures are implemented primarily on the basis of "commercial or monetary motivations," as stated by Heywood, and "fail to take into account the needs of local people in the areas where the adaptation projects are taking place."[110]

Ultimately, the lack of acceptance from rural communities could lead to a failure of biofuel adaptation projects as these projects are implemented primarily within rural communities. The authors noted that rural customs, practices, processes and institutions much be taken into account, governance must be addressed, social dynamics must be considered, and rural communities must not be seen as a homogenous group. The OCHA has stated that "communities know best what works for them; external actors need to listen and model their responses accordingly."[111]

It is not that land grabbing will lead to conflict, per say, but rather to stress the importance of a bottom-up approach in order to prevent human insecurity and conflict. Biofuels have been successful in northern Ghana, where socially responsible strategy and a participatory investment approach involved local populations and accounted for land use patterns, population density, and local livelihoods.[112]

Conflict, in and of itself, poses the most serious threat to human life, stability and development. As Heywood said, "We need to be looking into what we can do now to avoid conflict ever happening rather than waiting for it to happen then trying to fix it."[113] Any potential for conflict should be heeded with caution and preventive efforts should be taken. Using a bottom-up approach to human insecurity, particularly food and water insecurity, can mitigate the social impacts of climate change and serve to prevent instability, migration and, in certain circumstances, conflict.

To date, international approaches to adaptation have been led by the scientific community, which, generally tends to employ a one-size-fits-all approach. This is not adequate to address the impacts of climate change due to the fact that impacts, resilience and external contributing factors vary widely between communities, just as was seen in the 2012 study by Grimm, Ehrensperger and Kiteme. For many years, NGOs have worked to develop conflict assessment tools, also referred to as conflict assessment tools, to ensure that intervention programs and projects are sensitive to the context in which they are being implemented. Performing a conflict assessment can identify underlying interests, goals, positions, capacities and relationships that may not be regularly visible. In the case of biofuel production, conflict assessments can assist all stakeholders in understanding the context in which the project is being implemented and how it can be most successful while also diminishing harmful and unintended impacts.

Within the context of climate change, conflict assessment tools can be used to transform a bottom-up approach into a reality, through engagement of stakeholders and a multi-dimensional analysis of the context. This tool can assist to accurately identify insecurities and to determine the most suitable adaptation projects and initiatives for each community.

The origin of the modern use of conflict assessments lies in the Do No Harm (DNH) debate launched by Mary Anderson in 1994. Anderson brought attention to the fact that humanitarian and development aid may do more harm than good in certain circumstances. Since then, numerous organizations have developed their own context assessment tools, most notably the United States Agency for International Development (USAID), the United Kingdom's Department for International Development (DfID) and the World Bank. However, smaller NGOs have also made their own assessment tools. As there is no single assessment tool that is applicable to all projects, contexts or conflicts, organizations develop tools that are specific to the type of projects they will be implementing.

Generally, conflict assessment tools are best applied as part of a cyclic process,

which includes assessment, project design, implementation, monitoring, and adjustments. This helps to measure the negative and positive impacts of a project and its impacts on social dynamics.

To date, conflict assessments specifically focused on climate change impacts have been limited, but not nonexistent. In 2009, the International Institute for Sustainable Development (IISD) was contracted by CARE International and Save the Children UK (SCUK) to conduct a study on the climate-related vulnerability and adaptive capacity of the Borana and Somali pastoralist communities in Ethiopia with the intent of providing guidance to the Government of Ethiopia, civil society organizations and international donors on development programming and advocacy. IISD compiled a series of "guiding questions" in the form of a survey as a basis for information gathering. Research included a 4-day training workshop and 10 days of fieldwork followed by data analysis and reporting. In order to answer the questions, field workers consulted with pastoral and agro-pastoral community groups as well as governmental and non-governmental organizations working with those communities. They gathered statistical data on population, livelihoods, geography and well-being and reviewed climate data from the National Meteorological Agency and FEWS NET. Additionally, a desk study gathered information from key documents including IPCC reports, Ethiopia's NAPA, and UNDP's Climate Change Country Profile for Ethiopia. The researchers found:

> To contribute to the enhancement of climate change resilience among pastoral and agro- pastoral communities in the Borana and Shinile zones, practitioners…should take into account current climate variability, projected climate change impacts, and climate change vulnerability and adaptation when developing programmes and projects.[114]

This supports resilience as opposed to solely development to ensure that development projects can withstand impending negative impacts of climate change.

Significantly, IISD not only developed an assessment tool, including the "guiding questions" survey and stages of information gathering, but also provided a series of seven components that civil society should include in programs and projects to support resilience. These components are not only applicable to the Borana and Somali populations of Ethiopia, but are a starting point for and should be considered by all NGOs implementing adaptation projects in communities. The sections that follow will analyze each component individually.

CREATING PARTNERSHIPS WITH WEATHER AND CLIMATE INSTITUTIONS

Partnerships between civil society and weather and climate institutions supports information sharing between the scientific and humanitarian sectors, which is a vital but nearly-absent relationship in the current approach to adaptation. Generally, scientific approaches use solely climatic predications or general assumptions of insecurities to

determine what adaptation policies are suitable. In addition, scientific communities, although at the forefront of progress, tend to look for a one-size-fits-all solution. On the other hand, humanitarian organizations do not have the technology or expertise of the scientific community. "Such data and information could be used to plan for, and adjust programme interventions to ensure that the livelihoods and welfare of communities are safeguarded and improved in the face of current climate variability and change."[115] It is only through a cooperative effort that resilience can be attained.

USING TRADITIONAL KNOWLEDGE AND STARTING FROM WHAT PEOPLE ARE ALREADY DOING ON THE GROUND

Understanding what communities and individuals are already doing to cope with climate change can assist in determining effectiveness and sustainability of certain coping strategies. In the assessment of the Borana and Somali communities, IISD found that communities were often forced into ineffective and unsustainable coping strategies due to a lack of other options, rather than based on a personal choice. By fostering participatory consultations in a community, NGOs can gain "insight into which community groups [women, men, youth and children] are vulnerable to what, and which coping strategies are implemented by different groups," with the goal of developing "sustainable alternatives to replace ineffective or unsustainable practices."[116]

Another study of the Borana, performed in 2011 by the Climate Change Agriculture and Food Security Research Program of CGAIR, formerly the Consultative Group on International Agricultural Research, aimed to determine what changes households were making to farming practices over the course of the past ten years and why. The study found that 62% of households surveyed made one or more changes to their crops in the past ten years.[117] The most utilized change to the most important crop was an expansion of land area, consecutively followed by earlier land preparation, earlier planting, planting a better quality variety(ies), stopping growing crop in one season, introduction of intercropping, introduction of a new variety(ies) and stopping growing crop totally. Other changes, each undertaken by 30 households or less, included introduction of crop rotations, switching to a shorter cycle variety, switching to a drought tolerant variety and introduction of a new crop.[118] There was an average of 5.16 changes per household to the most important crop. Despite these changes to crops, it was also found that more than 20% of the population suffers from food insecurity year-round and the first three months of the calendar year are those in which households suffer the most, with more than 90% suffering from food insecurity in January, 95% in February, and 20-25% in March.[119]

Based on scientific knowledge and a bottom-up approach, it can be determined that current coping strategies are not sufficient as the population continues to suffer widely from food insecurity. Undertaking a context assessment can assist NGOs in determining the sustainability and effectiveness of coping strategies, gather information

that can identify underlying factors and community-based structures and processes that may assist or hinder implementation of a project.

UNDERSTANDING CLIMATE-LIVELIHOOD LINKAGES IN AN INTERVENTION AREA

NGOs must not only understand which resources community members are dependent on for a livelihood, but which of those resources are sensitive to climate hazards and should be prioritized for adaptation. "Development programmes and projects should aim to decrease the sensitivity of these resources or should aim to decrease the dependence of communities on these climate-sensitive resources."[120] To date, there are two notable tools that have been created to analyze climate-livelihood linkages with the purpose of improving impacts of programmes and projects on community resilience, including the Climate Vulnerability and Capacity Analysis (CVCA) Framework and the Community-based Risk Screening Tool – Adaptation and Livelihoods (CRiSTAL). Identifying these linkages can assist NGOs in prioritizing projects related to the most vulnerable resources and livelihoods.

BUILDING ON COMMUNITY SUGGESTIONS AND RECOMMENDATIONS

Engaging communities to gather suggestions and recommendations is the most fundamental component to employing a bottom-up approach. The IISD engaged community groups to develop ideas for short-term coping strategies and long-term coping strategies. Although some ideas were common, such as migration, water infrastructure repair, and livelihood diversification, others were suggestions based on traditional community practices. These included community-based support through restocking and food sharing, the use of donkeys for transportation, haymaking and the establishment of community groups.[121] Had community members not been engaged, these ideas may have never been placed on the table and adaptation strategies determined as suitable by external actors could run the risk of failure.

However, it must also be considered that engagement can be biased. In communities where women are marginalized, engaging community leaders may result in a lack of input from women and, therefore, produce biased and incomplete information. Context assessments and conflict sensitive-approaches are necessary to ensure that engagement is inclusive as well as appropriate for community standards and does not cause unintended harm.

IMPROVING INFORMATION AND KNOWLEDGE SHARING

Although community-based input provided an array of coping strategies, the IISD found that there were internal disagreements regarding suitable strategies.

> Bringing these two groups [pastoral communities] together, as well as different NGOs and governments who work with these communities, to share experiences on climate risks and different adaptation strategies, could prevent the

> implementation of adaptation strategies that have already been shown to be unsustainable in the long-run and favour collaborative development of new adaptation strategies.[122]

The IISD suggested that NGOs strive to facilitate information sharing between weather and climate institutions (such as the NMA and FEWS NET) and local communities to ensure timely and language-appropriate information as well as support the use of climate information for planning.

In the CGAIR study of Borana, Ethiopia, researchers found that almost all households had not received a forecast for weather or pest and disease outbreaks. Of the select few that did receive forecasts, 78% received extreme weather forecasts through traditional sources, 23% through the radio and 2% through friends and relatives.[123] Nearly all were able to make use of the information. Gathering this information identifies the most utilized sources of information and can help to identify gaps in information sharing.

In another sense, a failure to disseminate knowledge to affected communities runs the risk of stakeholders being unaware of available coping strategies, mitigation techniques or even, simply, how climate may affect their livelihood. For example, another study of the Borana, specifically the Dire District, conducted in 2005 by Kejela Gemtessa, Dr. Bezabih Emana and Wktole Tiki and commissioned by the Pastoral Community Development Project within the Ethiopian Ministry of Federal Affairs, the report found that business-oriented approaches to adaptation were absent in the pastoral communities and may be beneficial. They found that incorporating business principles would "help to diversify livelihood[s…of the pastoral community, create risk management mechanisms, and adjust livestock populations to rangeland and water resources carrying capacities."[124]

ADDRESSING CONSTRAINTS TO ADAPTATION AND BUILDING ON ENABLING CONDITIONS

Through engagement with stakeholders, the IISD was able to identify the enabling conditions and constraints of each coping strategy. For example, migration as a coping strategy is enabled by the fact that young men in the community have the willingness and physical ability to relocate internally or internationally to find work or improved farming conditions. However, migration is constrained by conflicts between communities based on land and water resources and the limiting of livestock movement due to agricultural expansion. In addition, it was found that the negative effects of migration were also constraining factors that limited the use of this coping strategy, such as a separation of families and the possibility of exacerbated urban food insecurity and urban poverty resulting from rural-urban migration of unskilled labor. "The successful implementation of adaptation strategies will depend to a great extent on the ability of practitioners, communities and governments to address these constraints and build on existing enabling conditions."[125] A failure to consider these constraints could result in increased

vulnerability. Because these constraints originate from a mix of local, regional and national conditions and policies, joint action between NGOs, local communities and groups, as well as regional and national officials, is necessary.[126]

ADDRESSING THE UNDERLYING DRIVERS OF VULNERABILITY

The IISD found that the key underlying drivers of vulnerability include environmental degradation, population pressures, conflicts, social and gender inequalities, inadequate off-farm employment opportunities and skills, poor access to infrastructure, resources and services, weakening of the role of traditional social and governance institutions and inadequate government policies, coordination and capacities [127] Addressing these underlying vulnerabilities helps to strengthen sustainability and increase resilience. Being that climate change is a slow process, the time for prevention is greater than sudden-onset crises and, therefore, while the impacts of climate change are already being felt, there is still time to increase resilience and sustainability. To date, the scientific community has led the development of adaptation and mitigation techniques. However, technology alone will not be sufficient. Failure to address underlying drivers of vulnerability undermine programs and projects or even make them impossible to implement.

The study by Gemtessa, Emana and Tiki also shed light on the underlying drivers of vulnerability. The researchers aimed to analyze current coping strategies of various social groups within pastoral communities. Results of an extensive survey revealed that farming has been adopted to cope with food insecurity caused by declining livestock herds and coping strategies varied across economic groups.[128]

In addition, despite attempted coping strategies, the poor and destitute continued to have an average of only 2-3 food sufficient months compared to 8-12 of the medium and rich populations. This shows that poverty may be a driver of vulnerability as the poor and destitute have had to employ more coping strategies and continue to suffer disproportionately from food insecurity.[129]

Addressing underlying drivers of vulnerability in combination with the six previously mentioned components provides a starting point for NGOs when undertaking context assessment within the context of climate change. By utilizing these techniques, NGOs can increase the sustainability of projects and programs, increase efficiency of resource and funding allocation, and increase community resilience. Comprehensive engagement of stakeholders is regularly identified as the key to sustainability and conflict sensitivity. As Heywood states, "The more stakeholder that are consulted (and consulted in a serious manner in which their opinions are actually given weight) the less likely it is for conflict between stakeholders to flare up over the final outcome of negotiations."[130]

VI. BREAKING BARRIERS TO COOPERATION

Neither context assessment nor crisis mapping and data analysis can be utilized to their greatest potential without international cooperation. The key to a successful employment of a bottom-up approach to human security impacts of climate change lies in cooperation between civil society actors, primarily humanitarian and scientific communities, states, and international institutions. As stated at the 1992 Earth Summit, "Environmental issues are best handled with the participation of all concerned citizens, at the relevant level."[131] Many have agreed that the involvement of civil society in global environmental governance, although it has been limited, has "enriched the process and strengthened outcomes" in numerous cases, as stated by Minu Hemmati, a leading environmental psychologist who has focused much of her work on strategies for sustainable development and advocacy in light of climate change. [132] "Whereas governmental bodies and intergovernmental organizations often lack analytical capacity or are hampered by bureaucratic constraints and other obligations, NGOs can focus on a dynamic research agenda, and move quickly to address new issues."[133]

However, to date, a top-down approach continues to be applied and, as this paper has proven, this is not adequate. Civil society engagement is essential to employing a bottom-up approach but existing international structures and processes do not enable civil society to fulfill its role effectively.[134] In addition, divergent approaches to the human security concept within civil society pose a barrier to a united and comprehensive approach to threats. Breaking these barriers could allow the interjection of human security concerns of climate change into the international agenda and enhance prevention of human insecurity stemming from climate change through cooperation between states, international institutions and NGOs.

CONCEPTUAL BARRIERS

Numerous organizations and social movements have lobbied states, regional bodies and international institutions for environmental policy reform and regulation, have been involved in the UNFCCC processes or have organized relevant protests. However, when it comes to discussions on human security and climate change, NGO involvement has been sparse in an already near-absent debate.

Although the tools and expertise of humanitarian NGOs are needed to fill the gap in the current international approach to human security impacts of climate change, a divergence of approaches to human security within civil society poses as a barrier to international engagement. "Despite growing international concern about climate change...these issues have not been identified as priority areas for human security research."[135]

This divergence exists due to institutional processes that emphasize a hierarchy of

rights, prioritizing civil and political rights. Although the human security impacts of climate change are generally contextualized as an issue of economic, social and cultural rights, this paper has demonstrated that this is not the reality. Impacts of climate change bridge the divide between human protection and human development NGOs. Only can an international dialogue on human security impacts of climate change be ignited it civil society adopts a comprehensive approach to human security.

Some scholars have argued that developmental human security is altogether "impractical for policymaking" and therefore less endorsable at the international level.[136] This is due in part to its comprehensiveness, which limits its applicability on a global scale.[137] Conversely, human protection is more limited and therefore, theoretically, more feasible.[138] The Responsibility to Protect (R2P) is currently the most internationally-endorsed norm of human security.[139] Under R2P, states have an obligation to protect their populations from genocide, war crimes, crimes against humanity and ethnic cleansing. In the case that the state cannot provide protection or is unwilling, the responsibility to protect lies with the international community. It is the limits of the applicability of the R2P norm, to only those four crimes, and the employment of a top-down approach, that allowed it to be accepted as an international instrument.

It is highly unlikely that the human security impacts of climate change could be boiled down to a concept that would be widely accepted by the international community, and it may even be dangerous to attempt. Generalizing the impacts of climate change and taking a solely protection-based approach threatens to undermine the concept of human security altogether, disregard vulnerability, and ignore the role of civil society actors.

Unfortunately, NGOs employing an empowerment approach are not as welcomed into international dialogue because of a continued debate on how these economic, social and cultural rights can and should be fulfilled, how to measures progress, who is to be held accountable and what accountability mechanisms exist to ensure that they are upheld. Due to ambiguity and disagreement, these rights have remained secondary to civil and political rights on the international agenda.

It has been demonstrated that empowerment and protection are mutually reinforcing aspects of human insecurity prevention. A convergence of approaches within civil society would stress the importance of human security impacts from climate change. It would open the door for NGOs employing a protection approach to interject comprehensive human security concerns into international dialogue and begin the first steps towards a cooperative effort between civil society, states and international institutions. It would also serve to mutually reinforce the protection-oriented approach of states and international institutions. Cooperation from states and international institutions is needed to make this a reality.

If the two approaches fail to converge within civil society, the importance of empowerment will remain absent from the international agenda and the human security

implications of climate change on both protection and development will increasingly grow.

INSTITUTIONAL BARRIERS

Firstly, NGO participation in global environmental governance is limited by institutional barriers. Although NGOs can acquire consultative status at the UN, their participation in negotiations and dialogues is limited and they are usually prohibited from putting items on the agenda. With regard to climate change negotiations specifically, NGOs are occasionally granted access to Convention of Parties (COP) to the UNFCCC as observers. However, the same limitations exist. NGO engagement depends primarily on the willingness of states and international institutions to actively include NGOs in processes. If NGOs, or an international institution representing NGOs, cannot put items on the agenda nor actively voice their concerns, it is unlikely that a bottom-up approach will make headway in the international community.

To date, international institutions, such as the UN and the World Bank, and governmental agencies, including USAID and DfID, have taken the lead in addressing human security impacts of climate change, although not nearly to the extent necessary and, generally, through the use of a top-down or state-centric approach. Agenda 21 of the 1992 Earth Summit called on intergovernmental organizations, such as the aforementioned, to provide channels for NGOs "to contribute to policy design, decision-making, implementation and evaluation of IGO activities." Therefore, international institutions and government agencies must take the lead in applying a human security lens to climate change and engaging NGOs in policymaking, implementation and decision-making. The expertise, experience and tools necessary to employ a bottom-up approach and strengthen preventive efforts lie within civil society. "Enabling the constructive participation of civil society in global environmental governance is thus one of the most important tasks for policymakers concerned with the effectiveness of global governance," and is critical for achieving sustainable development goals.[140]

The second barrier to NGO engagement that must be addressed is under- or mis-representation. Certain NGOs simply do not have the access, resources or means to engage with international institutions or states on issues of climate change. In particular, NGOs from the global south are underrepresented at the international level. This results in powerful groups, those originating in developed countries, having disproportional leverage, especially since developed countries are less vulnerable. With vulnerable populations primarily located in developing countries, imbalanced representation at the international level threatens to undermine the human security concerns of particular populations- some of whose lives are already threatened. Policies and initiatives will not accurately reflect the needs of global society.

COOPERATION

Both of these barriers can be addressed if NGOs begin to work collectively to interject human security concerns into the international dialogue, if international institutions are open to engagement with NGOs and if all actors uphold mandates of protection. "The international community has begun to recognize that effective global action requires meaningful stakeholder involvement in international policymaking and implementation." [141] Historically, the UN has partnered with NGOs to assist in implementation of programs, focused primarily on emergency humanitarian response, civil and political human rights and election monitoring.[142] It is time for this cooperative effort to broaden to other fields and reflect the changing dynamics of a globalized world. "NGOs and other civil society groups are not only stakeholders in governance, but also a driving force behind greater international cooperation."[143]

In a truly cooperative international system, international, national and civil society actors could work together to strengthen effectiveness of global environmental governance, increase efficiency of response to crises and ultimately strengthen prevention. An ideal system would include implementers, regulators, funders, and information gatherers, analysts and sources.

Although this merely illustrates a model of cooperation, striving for the fundamental purpose of this model (the coordinated exchange of information and resources) can greatly benefit the current international approach to human security impacts of climate change.

Utilizing the tools of civil society, such as crisis mapping and context assessments that foster a bottom-up approach, can strengthen this approach and fill in the gaps in the current system.

This proposed model is a means through which to centralize human security efforts and foster information sharing in a decentralized international community, and is also idealistic, but encourages the international community take small steps towards a worthy achievement, each step advancing vital preventive efforts.

VI. CONCLUSION

Climate change poses a threat to each and every human being. For some, this threat is already a daunting reality. For others, ignorance will not serve them well in the future. Climate change is not something we can ignore in the hopes that it will disappear with time. It is here and the time to act is now.

Traditionally, the international community has played a reactive role in addressing threats to human security. As this is an unprecedented threat that all nations face, this is an opportunity to act collectively and live up to the mandates of prevention that states and international institutions have emphasized for so many decades. Climate

change is not a traditional sudden-onset threat, but rather a slow process that gives us more time to act- but time is running out.

To date, the international community has failed to take preventive action due to a top-down approach that emphasizes mitigation. The vital components of resilience and adaptation are absent from this strategy but can be provided through engagement with civil society actors that employ a bottom-up approach to human security threats. Before it is too late, states, international institutions, civil society, the private sector and individuals must cooperate to address the human security impacts of climate change that are already effecting vulnerable populations. Within civil society, humanitarian NGOs must collectively adopt a comprehensive approach to human security, merging the human protection and human development components. NGOs have the power to implore action from states and international institutions and the tools to foster a preventive approach to human insecurity. Cooperation is the key. No single actor has the tools, knowledge, or resources to address climate change on their own. A cooperative strategy will allow for greater effectiveness and efficiency, and, in turn, prevention.

If we wish to leave this planet as a safe environment for future generations, we must realize that it is not Africa that is threatened by climate change, it is not low-lying states- It is each and every one of us. Only collectively can we ensure prevention.

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