Article

Climate Change and Conflict in Darfur

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Abstract
Drought, desertification and land degradation in Darfur led the pastoralists to migrate south for improved grazing for their livestock, yet farmers have denied them access due to their marginal lands leading to competing for access to land, water, and other natural resources. The increased competition aggravates the already uneasy political, social, and ethnic relationships in the Darfur region. Yet, the international efforts to resolve the Darfur crisis focus too heavily on peacekeeping and military strategy and not enough on climate and development. The paper intends to show that the non-recognition of climate change as a player in the conflict led to the lingering crisis despite the peacekeeping operations. The recognition will lead to seeking a solution beyond a political treaty between the rebels and the government and concentrate more on climate change and development that will provide a lasting solution to the conflict in Darfur.

Key Words: Climate change, Conflict, Desertification, Drought

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Introduction

After gaining independence from the United Kingdom in 1956, the Republic of Sudan has experienced decades of military regimes favoring Shari'a law, civil wars, and ethnic strife (CIA World Factbook, 2007). Since the 1980s, Sudan has experienced internal conflicts. In 1989, the National Islamic Front (NIF) gained power through a military coup. As a result of Arabization and authoritative policies, a 20-year civil war erupted between the Arab, Muslim north and the non-Muslim, African south, called the Sudanese People's Liberation Movement/Army (SPLM/A). In 2005, these two sides reached a peace agreement. However, conflict in another area of the country, Darfur, entered the crisis stage after years of low-level conflict (UNEP, 2007)

In 2003, the Sudan Liberation Army (SLA) headed by Minni Minawi, rebelled against the Government of Sudan (GOS) and its ruling party, the National Congress Party (NPC), by attacking the airport in El Fashir, the capital of North Darfur (Gidley, 2005). They cited grievances of political and economic exclusion from the centralized government. The act destroyed several Government of Sudan (GOS) air

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force planes that, in turn, triggered an escalation of the tensions between the Darfur people and the GOS (HRW, 2007). In response, the GOS enlisted the aid of the Black, nomadic, Arab-speaking population, called the Janjaweed, to subdue the rebellion.

Although the Sudanese Liberation Army (SLA) and the Government of Sudan (GOS) signed the Darfur Peace Agreement (DPA) in 2006, the fighting has continued to escalate (ICG, 2007). Since the fighting began over 2.5 million Africans have been displaced and over 250,000 people have been killed. The situation in Darfur remains very violent, extremely unstable, stagnates at the crisis stage. As a result of the crisis, management of the environment remains a peripheral issue in order to meet the immediate needs of affected populations.

The ongoing conflict in the Darfur region of Sudan has destroyed the lives of millions of people. In the west, the genocide is often portrayed as an ethic conflict only between the African farmers and the Janjaweed, or Arab nomads. However, the crisis has proven to be much more complex. Diving deeper into an analysis reveals a situation that involves numerous stakeholders across multiple levels, horizontally and vertically, with their own agendas.

In particular, the environment has played a key role in the conflict in Darfur. The inhabitants depend heavily on the natural resource base for their socio-economic activities. First of all, land and water access are crucial for sustainable livelihoods. The majority of people earn their livelihoods through subsistence agriculture, either farming or pastoralist (Fadul, 2004). With the increasing competition for land and water resources and the lack of local conflict resolution mechanisms, the relations between the competing groups have intensified.

Furthermore, the issue of climate change presents a continuing problem in the region. The International Panel on Climate Change (IPCC) reports convey that sub-Saharan Africa will experience some of the most significant effects from climate change, such as increasing occurrence and severity of droughts (IPCC, 2007). Darfur has already experienced some of these changes as documented by the UNEP post-conflict environmental assessment. Climate change impacts in Darfur can present significant implications for future conflicts due to the lack of conflict resolution mechanisms, low capacity, and absence of an adaptation strategy.

Additionally, the presence of oil resources in Sudan complicates the interaction with local, national, and international actors. Oil resources can lead to the phenomenon known as the "Resource Curse." Importantly, the overall interaction of local, state and international actors with the environment in Darfur has enhanced certain aspects of the conflict. While attempts at peace have been made, without addressing the environmental components of the conflict, the tensions will continue.

Although the Sudanese government and one of the three rebel factions signed the Darfur Peace Agreement (DPA) on 5 May 2006, the conflict has continued to escalate (ICG, 2007). Numerous reasons can be cited for the increasing violence; tense ethnic relations, lack of economic development, exclusionary political system. However, often times the surface reasons are not the actual root causes of the conflict. One aspect that is often overlooked is the role of the environment in conflicts. Specifically, Darfur is unique that the roles of resource wealth and scarcity play major parts in the crisis, which are being enhanced by climate change, low adaptive capacity, and unsustainable development, in a weak state with a political agenda that favors conflict.

Darfur and Climate Change

The region of Darfur in Sudan provides an interesting crossroads of environmental changes intersecting with socio-economic, political, and ethnic manipulations for inciting conflict. Recently, connecting climate change and the Darfur conflict gained scholarly and media attention. In 2007, UN Secretary General Ban Ki-Moon released an editorial in the Washington Post highlighting the connection between climate change and the conflict in Darfur (Ki-moon, 2007). He wrote how "... amid the diverse social and political causes, the Darfur conflict began as an ecological crisis, arising at least in part from climate change." The impacts from climate change, such as the year Sahelian drought, altered resource usage and access among the different stakeholders. Desertification increased significantly in northern and central Darfur, availability of fresh water resources declined, and farmland and grazing areas deteriorated. Interestingly, the same drought affected 16 other countries in the Sahel region (Smith and Vivekananda, 2007). However, only Sudan has experienced such widespread violent conflict due to climate change impacts. What political, social, economic, and environmental conditions in Sudan initiated the violent conflict in Darfur? The following conflict analysis attempts to highlight the environmental aspects of the Darfur crisis and provide recommendations for peace building through climate change adaptation.

The first noted climate changes occurred in the mid-1980s with the decreased rainfall amounts in the Sahel region, especially in the states of Darfur and Kordofan. The 1984-1985 droughts were especially brutal to pastoralists, where the majority of their animals perished, and adding economic insecurity to their tribes. Studies by the International Panel on Climate Change (IPCC) and UNEP have tracked this decrease in rainfall across the Sahel region and also predict a continued reduction in rainfall amount.

Furthermore, according to UNEP, the desert has shifted 50-200 km southwards based on rainfall and vegetation records since 1930, thereby increasing desertification significantly. The reoccurring droughts and the increasing desertification initiated the migration of the pastoralists into the more fertile regions in the central and southern parts of Darfur. As a result, previous land use agreements between pastoralists and agriculturalists disintegrated due to environmental degradation, thereby increasing conflicts between the once symbiotic livelihoods.

The influx of pastoral migrants from the Northern Darfur into the central part of the region exacerbated tensions between the current occupants and the newcomers by increasing the number of people competing for land, water, and grazing rights. "Environmental scarcity is more likely to produce migrants than refugees, because it usually develops gradually, which means that the push effect is not sharp and sudden and that pull factors can therefore clearly enter into potential migrants' calculations." (Homer-Dixon, 1991). With the migration of pastoralists from north to south combined with an increase in population density, increased the competition for scarce resources. "Demographic and environmental stress can increase the level of grievances within societies, which in turn can provide ruling elites with incentives and opportunities to exploit these grievances to serve their own purposes." (Kahl, 2006). The GOS understood these livelihood and demographic tensions between Arab and African groups and exploited them by creating the Janjaweed. For their reward, the Janjaweed, typically landless, can seize lands from the predominantly non-Arab agriculturalists. Also complicating matters is the population increase from the west, due to the influx of Chadian refugees. (De Waal, 2006). Significantly, all of these groups are chronically impoverished, marginalized, and lack the capacity to improve environmental conditions. The population increase in Darfur and the decreasing amount of quality resources deepens the cleavages between groups and solidifying their grievances against one another.

Increasingly Scarce Water Resources:
A significant problem in the Darfur crisis is the lack of accessibility to potable water resources for domestic, livelihood and humanitarian uses. A particular concern is the water resources underlying the refugee and IDP camps in West Darfur. Previous studies have shown that the aquifer has the potential to supply water for towns and villages, but not including the hundreds of thousands of camp inhabitants. Darfur experiences rainfall during four months of the year and the geology is unfavorable for groundwater storage (Tearfund, 2007).
Furthermore, on the government level, several different government ministries manage water resources. Also, the GOS favors dam projects and large-scale agricultural schemes that favor the *jellaba.* These projects hurt small-scale users. Most of the water is accessed through digging wells, mataras (irrigation) and *wadis* (when filled with water) and boreholes (Mohamed, 2004). Competing users include subsistence agriculturalists, pastoralists, and smallholder farmers for cash crops. Control over these sources of water has been a source of contention between rebel groups, janjaweed, local tribes, towns, and humanitarian camps.

Additionally, humanitarian camps rely heavily on these sources of water to provide basic needs to the Internally Displaced Persons (IDPs) and refugees. Many of the camps are located in arid locations where water reliability is limited. Current water usage is not sustainable, especially if the camps remain long-term (ICG, 2007). Humanitarian camps often lack the capacity to monitor water-usage and groundwater levels due to money, time, and personnel constraints. Furthermore, the lack of water resources forces camp residents, usually women, to leave the compounds. As a result, women are frequently attacked and raped (Smith and Vivekananda, 2007). The lack of water resources is a humanitarian, livelihood, and security issue in the region.

Also, some of the larger refugee camps (such as Kalma camp with 90,000 inhabitants) have a more significant water problem than other smaller camps. The high water usage combined with the drought, is depleting the water resources faster than they can recharge. Specifically, in the areas of Kalma, Abu Shouk and Al Salaam water in the wadis may or may not adequately recharge the Basement Complex aquifers supplying these camps. As more refugees enter the camps escaping the increased violence, the water resources will be depleted even faster. Another factor to consider in water resource management in the region is the arrival of approximately 26,000 peacekeeping troops in 2008 which increased the competition for water (UNEP, 2007).

Furthermore, a lack of conservation education impacts how refugees view water, as a "free" resource. According to UNEP report, 94% of surveyed families used more water in the camps than in their previous homes. Currently, refugees use water to make bricks to build their homes since lumber is not available. This brick-making process uses a significant amount of water. Also, the water is handed out for free to the refugee population, so they are inclined to use as much as desired. As a result, humanitarian organizations are seeking methods to promote a more sustainable livelihood, especially given the severe drought conditions in the past. The Darfur refugee camps demonstrate the delicate balance between supporting livelihoods and sustaining the environment to help manage the crisis.

Lack of Climate Change Adaptation Strategies: Due to Darfur's remote location, marginalization from the central government, and lack of development, the region was ill prepared to deal with the climate change impacts over the past 20 years. The implications were seen was early as the 1980s. Social scientist

Dr. Alex de Waal met with an Arab sheikh, Hilal Abdalla, who described the breakdown of relations between pastoralists and farmers due to the drought and decreased supply of arable land (Faris, 2007). "Farmers who had once hosted his tribe and his camels were now blocking their migration; the land could no longer support both herder and farmer." By blocking the migration of pastoralists, many of them lost their stock and turned to farming on marginal lands. In past climate cycles, these tribes were able to adapt their practices to the environmental conditions. However, in the 21st century, the presence of international actors, the GOS, globalization, arms trade, and market forces discourages the use of traditional livelihood practices to cope with climate variations. "... In future environmental security research will have to conceptualize its research agenda in awareness of the potential disruptions of climate change and myriad other ecological factors in an increasingly artificial global "environment." (Daly, 2007). As a result, the climate change factor decreased the feeling of human security for both the agricultural and pastoralist tribes, creating cleavages. Climate change will continue to alter the landscape, water availability, and traditional relationships across Darfur. Unfortunately, climate change will hit the poorest hardest as it had in Darfur.

International Intervention in the Conflict in Darfur

The African Union/UN Hybrid operation in Darfur, referred to by its acronym UNAMID, was established on 31 July 2007 with the adoption of Security Council resolution 1769. On 31 July 2008, the Security Council extended UNAMID's mandate for a further 12 months to 31 July 2009 and then again on 6 August 2009, for a further 12 months to 31 July 2010 (UN, 2011), all in reaction to the civil war that erupted in Darfur in 2003 between the Government of Sudan and its allied militia, and other armed rebel groups. Particularly during the first two years of the conflict, tens if not hundreds of thousands of people were killed. Fighting continues between the Government and the now splintered movements, and 1.8 million people are estimated to be internally displaced.

UNAMID has the protection of civilians as its core mandate, but is also tasked with contributing to security for humanitarian assistance, monitoring and verifying implementation of agreements, assisting an inclusive political process, contributing to the promotion of human rights and the rule of law, and monitoring and reporting on the situation along the borders with Chad and the Central African Republic.

In 2003, the United Nations first raised the alarm on the crisis in Darfur. Since that time, finding a lasting resolution has been a top priority for the Security Council as well as two consecutive Secretaries-General. The long peace process included the Darfur Peace Agreement signed on 5 May 2006 under the auspices of the African Union (AU) and with support of the UN and other partners.

Intensive diplomatic and political efforts to bring the non-signatories into the peace process have continued since then, with the All Darfur Stakeholders' Conference of 27-31 May 2011 in Doha intended as another milestone. Once an agreement has been reached between the major parties to the conflict, the United Nations and African Union intend to bring the peace process back to Darfur for dialogue and implementation on the ground.

In 2006, the African Union deployed a peacekeeping mission to Sudan, which was replaced in 2008 by the unprecedented joint African Union/United Nations Hybrid operation in Darfur (UNAMID), currently the largest peacekeeping mission in the world. UNAMID's mandate has been extended since then, most recently until 31 July 2011, and currently stands at 92 per cent of its authorized troop strength of almost 20,000.

The Mission's headquarters is in El Fasher, the capital of North Darfur, with further deployment locations throughout the three Darfur states. The Mission conducts about 160 patrols a day, attempting to increase its robustness, often in the face of bureaucratic or armed obstruction. The aim is to do everything in its power to protect civilians in Darfur, facilitate the humanitarian aid operation to all areas, regardless of who controls them, and to help provide an environment in which peace can take root.

Climate Change and Conflict Resolution in Darfur

There will be no peace in war-torn Darfur unless the region's water shortages are tackled. When you are dealing with very hungry people and desperately poor people, unless you also put forward a realistic and viable development option, you cannot make peace (Jeffrey Sachs, 2006). Sudan is unlikely to see a lasting peace unless widespread and rapidly accelerating environmental degradation is urgently addressed (UNEP, 2007).

In the international policy realm, climate change has gained more attention in the past several years. With the release of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, the scientific community has verified that the "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level" (IPCC, 2007). Additionally, in 2007, the publishing of the Stern Review found that the "...the benefits of strong, early action considerably outweigh the costs." In particular, both reports strongly agree that developing countries will be the hardest hit by climate change due to lack of financial, technical, and institutional capacity. Importantly, the Stern review notes: "Climate-related shocks have sparked violent conflict in the past, and conflict is a serious risk in areas such as West Africa, the Nile Basin, and Central Asia." Analyzing the linkages between climate change and conflict has found a renewed interest.

Despite the renewed interest in the climate change and security nexus, the phenomenon is not new. In the 1970s, Richard Falk's This Endangered Planet and Lester Brown's Redefining National Securityboth explored the connections between security and the impending climate change (Falk, 1971). Specifically, Falk pointed out the relationship between time and climate change: the faster the rate of change, the less time to adapt (Brown, 1977). As a result, without proper institutional capacity to manage environmental changes, the risk for violent conflict increases especially in weak states.

Another prominent scholar, Jon Barnett, explores the linkages between climate change and conflict: the political scale, the nature of governance, and the nature of environmental (as opposed to resource) changes affected by climate change (Barnett, 2003). Since climate change has global impacts versus a localized problem, different levels of analysis will be needed to understand the social, economic, and political effects on livelihoods, especially for adaptation programs. Furthermore, Barnett stresses the importance of understanding that nation-states are unlikely to declare war with one another due to climate change effects, most likely conflicts will erupt intrastate. "Conflicts in which environmental change appears to be a contributing factor tend to be within rather than between states, and it is at this sub-state level that a climate change-conflict research agenda would most profitably focus." Research by Hendrix and Glasner (2007) supports this need for research, analyzing different geographic scales to incorporate sub-state factors.

Rather than solely a state-level problem, climate change will have different effects on varying scales. Currently, most of the literature focuses on state level analyses (Nordas and Gleditsch, 2007). States may

have a propensity for using climate change to further their own agendas. Therefore, Barrett argues that issue of climate change should not be hijacked for military and sovereignty agendas that would undermine the nature of the global common and foreign policy problems. Solutions should be in the spirit of preventing environmental injustices against sensitive populations; and strengthening the state's capacity for climate change policies. Furthermore, the need to develop a state's capacity to mitigate and resolve conflicts will be crucial for long-term planning.

Weak states can contribute to the outbreak of conflict as well. "The weakening of the state is seen as an intermediate factor between resource scarcity and violent conflict." (Raleigh and Urdal, 2007). Furthermore, the weak state theory has tw o channels: one focuses on the society side of weak state-civil society relations and the other on the state's relationship with civil society (Humphreys, 2005). With resource scarcity, degradation of the environment can weaken the social cohesion and functional capacity of a state. Additionally, focusing on the state side, rich oil resources can contribute to a weak relationship between states and civil society (Kahl, 2006). States will rely on oil revenues rather than taxation systems to fund their government. States have less accountability with their constituents and less incentive to provide public services. With impending climate change, a state's capacity for mitigation and adaptation will be crucial. As a result, targeting weak states is paramount for preventing climate change related conflicts.

Essentially, climate change will significantly affect livelihood securities as well. "The impacts of future changes [of climate change] will be felt primarily by resource-dependent communities through a multitude of primary and secondary effects cascading through natural and social systems." (Adger, 2003). Some impacts will be gradual, such as desertification, droughts, or rising sea levels, or some immediate with increased heat waves or strong storms. Despite the type of environmental change, the underlying issue remains the same: human livelihood insecurity. An urgent need develops for the state to increase their role for service delivery and less on their traditional national security agendas.

> .. .Climate change undermines human security in the present day, and will increasingly do so in the future. It does this by reducing people's access to natural resources that are important to sustain their livelihoods. Climate change is also likely to undermine the capacity of states to provide opportunities and services that help people to sustain their livelihoods, and which help to maintain and build peace. In certain circumstances, these direct and indirect impacts of climate change on human security and the state may in turn increase the risk of violent conflict.(Barnett and Adger, 2007)

Therefore, climate change adaptation projects, especially those in weak states, should focus on increasing the state capacity for conflict prevention. The state will need to handle significant macro issues such as disaster relief programs, food insecurity from agriculture failures, decreasing potable water supply, human migrations, livelihood protection and diversification, and competing interests for natural resources.

Combining a weak state-civil society structure with the onset of climate change creates a new set of problems. For instance, states heavily reliable on agriculture commodities will be affected by climate change through decreasing crop yields.

Containing conflict is critical at the local level as well. Citizens, especially in rural areas, must be given the tools to increase their capacity to adapt to climate change. In particular, local conflict resolution mechanisms and environmental education will be necessary to mitigate issues of resource access, especially among pastoralist and agriculturalist communities (Brown, 2007). Importantly, these systems should include early warning indicators to prevent conflict from erupting between groups of people.

Additionally, one significant consequence of immediate concern is food security. While greenhouse gas (GHG) emissions continue to increase, climate change will continue to impact the global population in several different ways. For instance, the IPCC report states that when temperatures rise above 3° C, the potential for food production will decrease. As a result, without proper governance and effective institutions in place, the potential for food insecurity will occur. In turn, without proper distribution mechanisms, conflict can erupt. Therefore, research and development should focus on preventative measures to mitigate conflict. "This calls for the urgent need for mitigation against the causes, and management of environmental insecurities arising from threats such as degradation and climate change." In particular, projects should focus on sector reforms for adaptation and distribution of resources (Clover, 2005).

At the government level, market forces and institutional policies can increase environmental changes. By planning for long-term strategies, such as switching to less-water intensive crops, improving the distribution of food, and environmental education can help societies adapt to changes in supply. "Therefore, adaptation processes involve the interdependence of agents through their relationships with each other, with the institutions in which they reside, and with the resource base on which they depend." In other words, a primary adaptation strategy is improving the state's capacity to provide basic needs for its citizens, and plan sector strategies based on the climate predictions for their region. "But there are some public goods that can only easily be provided by the state. These goods include major infrastructural investment in flood defense, the management of water resources, and spatial planning that become necessary when the impacts of climate change are significant and risky for large populations." (Adger, 2003) Weak states continuously fail to provide public goods for their citizens. Strengthening multiple levels of governance: local, regional, and national: will help states prepare for climate change.

Part of the strategy for adaptation should include grassroots education and collective action campaigns to strengthen civil society and their knowledge of climate change. Important to adaptation, however, includes the incorporation of indigenous knowledge in these programs. In particular, this step will be crucial in post-conflict societies as a method for localizing solutions and improving the social fabric. "Thus, stakeholders from the civil society buy into a shared vision of risk and adaptation in the long run and sustainable resource management in the immediate term." However, vertical linkages between civil society and the state must be present in order for this scheme to be effective. As a result, healthy social networks are key for adaptation and recovery, especially with extreme weather events. People will be more inclined to help one another if they have a sense of trust with their neighbors.

Furthermore, in post-conflict reconstruction, climate change can impede the peace building process. War-torn societies will find themselves reconstructing economies while concurrently adapting to climate change. The variability of climate change can impede economic growth. Therefore, in development projects, adaptive capacity to climate change must be included with post-conflict reconstruction projects, especially for strengthening institutions. "The constraints on adaptive capacity- poverty, weak

governance and political marginalization- are also among the factors that contribute to conflict." In other words, development and climate change adaptation programs have dual benefits to war-torn societies. "'Adaptation', if well done, could help direct international money and attention to reducing vulnerability not just to climate change but also to environmental degradation, poverty, and conflict." Since environmental degradation and poverty are often root causes of conflict, climate change adaptation policies conform well to the peace agenda..

On the other hand, post-conflict reconstruction programs can include opportunities to increase climate change adaptation. The goals of both programs are mutually beneficial. "...Adaptation does indeed provide an opportunity for positive, fruitful intervention by the international community to foster peaceful economic cooperation among competing groups of resource users in regions where achieving sustainable livelihoods is a challenge at the best of times."Climate change adaptation programs can bridge the divide between groups. "By resolving conflict and creating the environment for sustainable use, networking social capital and co-management institutions enhance the capacity to adapt to the impacts of changes in climate..." In turn, these relationships will strengthen civil society through trust and cooperation. When impacts from climate change occur, conflict mitigation mechanisms will already be in place.

Conclusion

In conclusion, the crisis in Darfur presents a tough challenge for peace initiatives due to the complexity of the conflict and the sensitivity of the environment. The fluid socio-political identities does not allow for a one-size fits all approach. A wide breadth of stakeholders must be involved in order to improve dialogue and incorporate multiple interests in the peace building process. Further negotiations should include a wider breadth of stakeholders that will include additional rebel groups, Arab tribes participating in militias, non-violent tribes who have traditional rights, civilians, refugees, and Internally Displaced Persons (IDPs) in the next round of negotiations.

Additionally, the environmental aspects of the conflict should not be pushed aside for political initiatives. The Darfur Peace Agreement (DPA) failed to address the environmental root causes of the current conflict: land tenure, drought management, and water access. The environment plays a central role on the local and national scales.

Any peace building solutions must incorporate environmental components into policymaking toolboxes. Traditionally, environmental measures are not considered in traditional peacemaking initiatives. However, with the onslaught of climate change, environmental aspects in conflicts will gain more importance for resolving violent situations. In addition, adaptation strategies to climate change and peace-building initiatives are not mutually exclusive. They can be incorporated into one another due to the fact that they have similar goals: poverty alleviation, improves adaptability of communities, and manages the environment effectively. Finally, Darfur highlights key environmental early warning signs for conflict, such as the breakdown of traditional relationships over natural resources, and scorch-and-burn tactics by dissenters. Isolating these important environmental factors can help conflict mitigation programs quickly identify and neutralize triggers.

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