UN environment

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Early Warning, Emerging Issues and Futures

Environment, Climate Change and Security

Background

The key message for this brief is that conflict degrades the environment and environmental degradation can be a driver of conflicts. When climate change accelerates environmental degradation, the risk of conflict increases. This feedback loop is demonstrated in the case of South Sudan. The international community engaged in implementing the Sustainable Development Goals (SDGs) must understand these interconnections between environment and security in view of the onset of climate change.

Introduction - what the issue is:

Climate change is happening, and it is a threat to human security. The potential future effects of global climate change include more frequent wildfires, longer periods of drought in some regions, and an increase in the number, duration and intensity of tropical storms. Recent global news headlines in 2018 from Europe, Japan, and Australia decry our lack of preparation for the inevitable and point to new stressors that will change the way we live. On 9 August 2018, the New York Times proclaimed, "2018 is shaping up to be the fourth-hottest year, yet we're still not prepared for global warming". [1] The US National Aeronautics and Space Administration (NASA) confirmed this trend on 06 February 2019.[2]

Climate change is an emerging global consensus that will stress the economic, social, and political systems that underpin each Nation and State. Although itis increasingly being understood as a global and local reality, its impacts on human security are often neither fully understood nor directly attributable because of the complexity of causal pathways in conflict situations. Future investments in global and national security must recognize the threat and provide preventative and mitigative solutions.

This brief contributes to our understanding of climate change and security and highlights a recent environmental assessment conducted by the Government of South Sudan (GOSS), with support from UN Environment Programme, and its insights on how climate change impacts human security. Human security programmes have advanced in-depth analysis of the local context to understand the multidimensional consequences of climate change and its impact on the severity and distribution of risks and vulnerabilities within countries.

What do we know of climate change and human security?

In its "Climate Security Report", CNA, a non-profit research and analysis organization located in the USA, notes that academic researchers have been debating the links between climate change and conflict for decades. The current consensus is that climate change alone is unlikely to be the primary cause of conflict, but it is an important threat multiplier.[3] As such, climate change has been identified as a threat multiplier, which can exacerbate existing threats.[4]

Climate change, with increased temperature and or more erratic precipitation regimes, has effects globally. What scientists had predicted in the past from global climate change are now occurring: loss of sea ice, accelerated sea level rise and longer, more intense heat waves.[21] Hsiang et al (2013) assessed 60 studies on subjects related to climate, conflict, temperature, violence, crime, and others, and re-analyzed those studies' data using a common statistical framework.[5] They found a "strong causal evidence linking climatic events to human conflict across a range of spatial and temporal scales and across all major regions of the world. The magnitude of climate's influence is substantial: for each 1 standard deviation (1σ) change in climate toward warmer temperatures or more extreme rainfall, median estimates indicate that the frequency of interpersonal violence rises 4% and the frequency of intergroup conflict rises 14%".

Juba, South Sudan, February 2017. Women and children sitting on the ground. Yellow jerrycan with number of a displaced family. Camp for internally displaced persons (IDPs).
Adriana Mahdalova/Shutterstock.com

Why is this important?

The study of the environment – conflict nexus in South Sudan and other countries in conflict can inform how social and environmental sciences could feed into peace negotiations and post-conflict programming. Conflict has touched all socio-economic and environment sectors of South Sudan through complex, interconnected pathways. With knowledge of these pathways, the international community will have a better understanding of how to avoid or mitigate conflict situations where the environment is among the causal factors. -Specifically, we need to build environmental sustainability into humanitarian assistance, while at the same time taking cognizance of environment linkages with security when planning sustainable development. If we do not take these precautions, there is risk of a growing human insecurity in South Sudan. The insecurity may lead to poverty, more conflict, and migration with ripple effects in neighbouring countries and eventually outside the African continent.

There is a risk that conflicts can mask hotspots of environmental change. Disruption of wildlife migration, land degradation, pollution, etc. might go unnoticed because of conflict – making sustainable peace even harder to reach since the population will not have adequate resources to sustain itself after peace is established.

Current situation and likely impacts in South Sudan

The South Sudan's first State of the Environment and Outlook Report (2018) documented the key environmental challenges of South Sudan. The report highlights how climate change is contributing to the vulnerability of communities and driving the risks described above 15.

WFP (2014)[7] describes the negative consequences of long-term climate projections on food security and livelihoods in the 11 livelihood zones in South Sudan, as mapped by the Famine Early Warning Systems Network. It recommends a number of measures such as continued investment in flood protection, improved drainage, construction of flood control measures such as barriers, improved retention areas and prevention, accurate flood forecasting, warning alerts and land use planning as the most preferred measure.

There are several likely and observed impacts on pastoralism, farming and other livelihoods, as well as the effects of a changing climate on ecosystems and their services in South Sudan. Some of them include the delay and shortening of rainy seasons that farmers depend on for crops and water for livestock, and reduction of wetlands, impacting food and fodder availability for livestock and wildlife. Others include perennial rivers drying up due to higher evaporation, resulting in seasonal rivers, and as a result of increased river seasonality, the loss of fish species and reduced fish size and reduced water tables in boreholes.[15]

What are the findings

How climate change triggers conflict

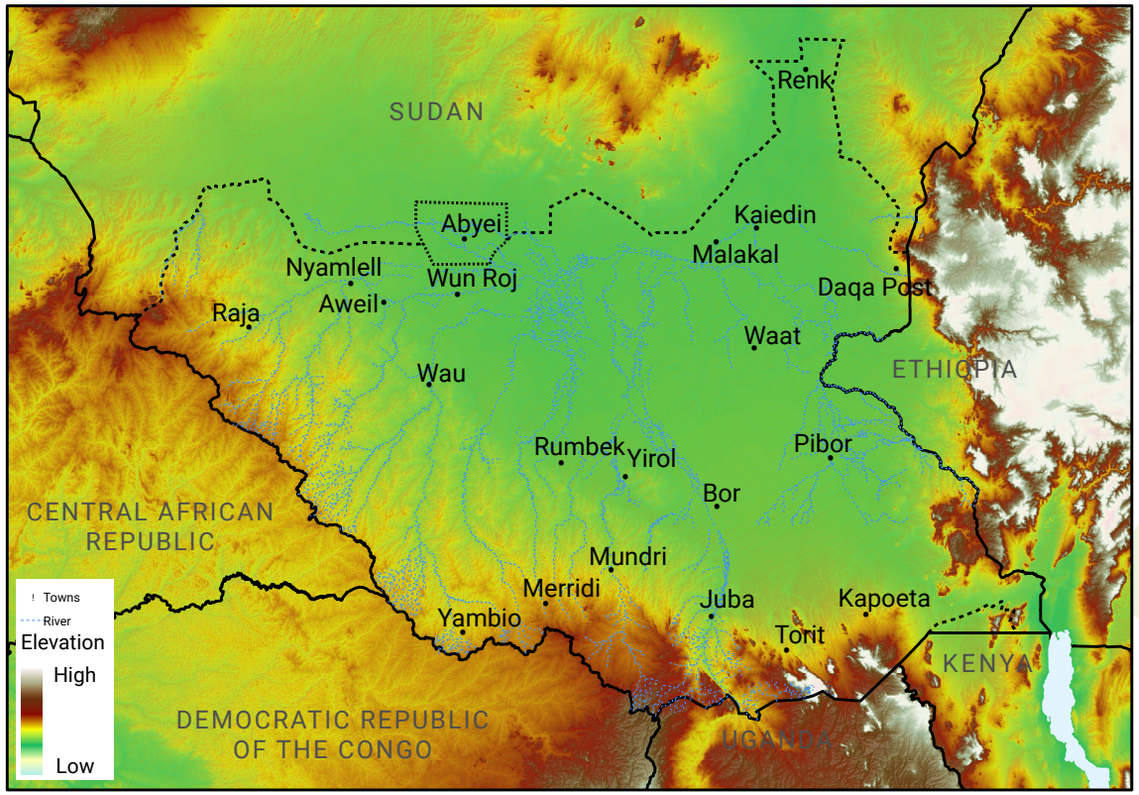

Figure 1: South Sudan – shaded relief map South Sudan (Figure 1) received its independence in 2011, and like many new countries, has suffered birth pains. Its internal political struggles have been complicated by droughts and erratic rainfall which have hindered its development. Figure 2 shows a recent upswing in average temperatures and decrease in rainfall, concurrent with the lifespan of the new state.

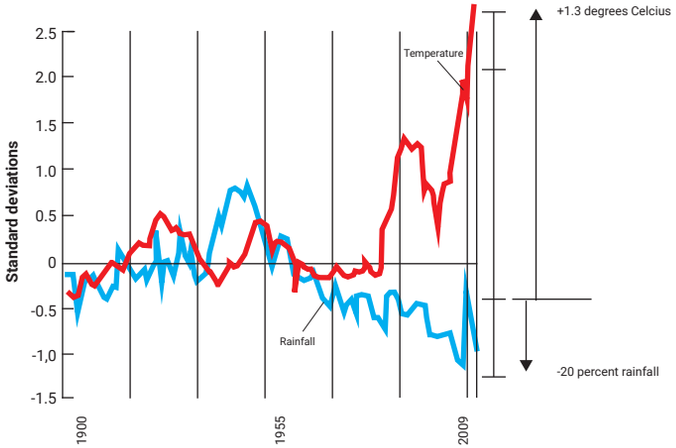

Figure 2: Trend in temperature and rainfall, 1900-2009. Richardson (2011) (11).

Furthermore, USAID (2016) 12 projects that average temperatures in South Sudan will rise by 1°C by 2060, with lower increases in the southern regions.

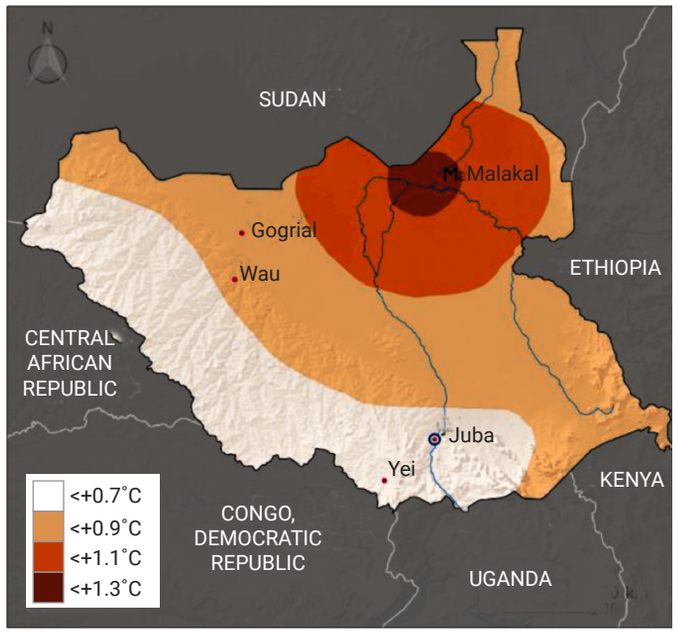

Figure 3: Projected change in temperature for South Sudan, 1960-2039 (USAID 2016)

Figure 3 is the result of adding temperature increases already observed in South Sudan with predicted increases through 2039. Most of the area shown will experience an increase of between 0.5° C and 1.3°C from 1960 to 2039, with the Unity, Jonglei and Upper Nile States around Malakal projected to have the highest increases.

Poverty is a strong indicator of impeded development.[13] Indeed, inhabitants of Jonglei, Upper Nile and Unity States have borne the brunt of conflict during the war for independence and more recently, a civil war.

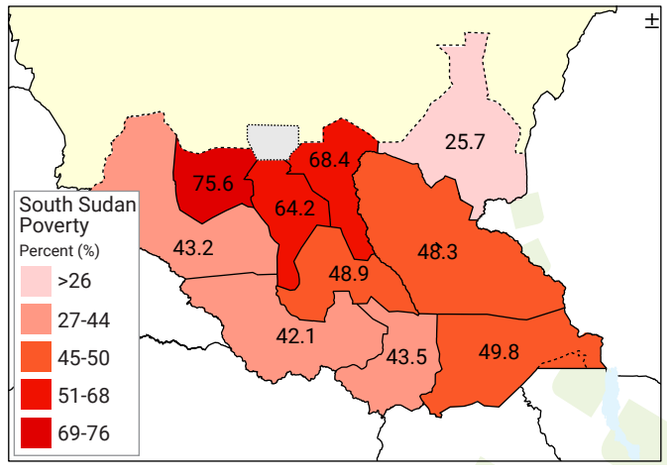

Figure 4: South Sudan poverty by State.[13]

Most of South Sudan's population lead an agro-pastoral existence as about 81 per cent of households cultivate land, and 74 per cent own livestock.[15] Movement of livestock depends on availability of rainfall and pasture, and during the dry season pastoral communities migrate with their cattle to areas with abundant water and "toiche" resources (riverine - marshland vegetation) (Photo 1).

Photo 1: Herd of cattle on road to Bor, guarded by armed men. *Photo credit: BBC World Service/Flickr.com/CC BY-NC 2.0.*

Over centuries, the community of herders in South Sudan have built complex social relations with their neighbours, ranging from intermarriage to cattle raiding. Cattle raids are conducted to replace cattle lost to disease or to increase stock for dowry payments.[15]

The longstanding practice of cattle raiding has become both deadlier as a consequence of South Sudan's conflict, and more frequent due to climate change. As a result of these twin drivers, cattle raiding now carries potential for conflict escalation. The government faces great challenge of overcoming violence in remote areas where raiders armed with guns and machetes.

Migration occurs more frequently with increased incidences of drought and is a contributing factor to the frequency of **cattle raids**. The causal loop diagram (Figure 5) describes the relationship between climate change and conflict in Jonglei State, South Sudan.[11] As conflict impeded education, literacy, and economic development, it laid the ground for multiple negative impacts from drought. If climate change leads to increased incidence of drought and flooding, it will be a trigger for migration, more frequent cattle raids, and armed conflict.

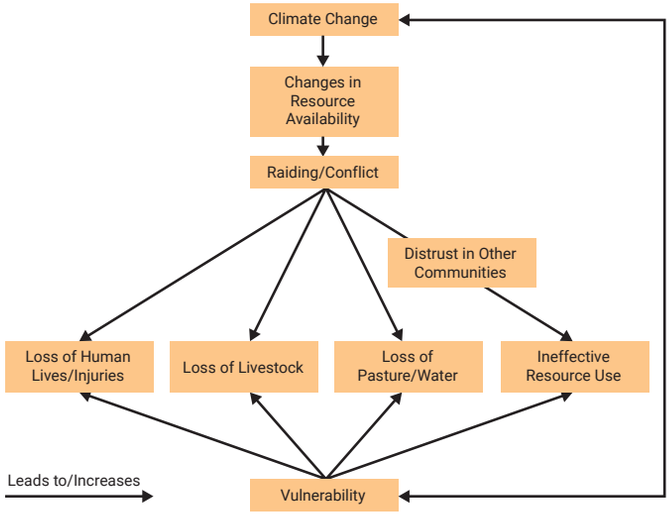

Figure: relationship between climate change and conflict (Source, Schilling et al 2012)(8)

With the abundance of small arms and lethal weapons (SALW) available following the war for independence, the lethality of acts of violence increased dramatically. In response to cattle raids by those with automatic weapons, some communities resorted to arming themselves as a means of self-defence, or to aid their own retaliatory attacks. This led to a growing cycle of violence and revenge, which has fuelled the current conflict that has gripped the country.[11] The key message here is that drought and climate change can trigger pre-conditions for conflict.

How conflict degrades the environment and exacerbates climate change

1. Oil

South Sudan is endowed with abundant mineral resources and the potential for secondary and tertiary industries, but the only modern sector is the oil industry. In fact, oil is currently the backbone of South Sudan's economy, as it alone accounts for 98 per cent of the Government revenue and in recent past, it contributed 60-80 per cent of gross domestic product.[11]

The impact of oil exploration and production include deforestation, loss of wildlife habitat and biodiversity, loss of grazing land, and soil and water contamination especially of critical wetlands due to oil spills (Photos 2 and 3). The impact on the local communities has been a loss of traditional livelihood opportunities such as fishing, eviction of communities and resulting mistrust between local communities and oil companies, and emerging health problems related to exposure to oil contaminants, including gas flaring.

Photo 2: Dead goats that drank from the contaminated mud pit at Gummry Oil Field, #17 on the 14th of January 2017. The mud pit was neither treated nor backfilled *(Source: Mr. Humoon, Ministry of Petroleum - HSE).*

Photo 3 On December 3, 2015: A Pipeline Oil Spill was discovered and reported by a nomad herdsman trespassing through the oil field with his herds. An estimated 1,000 barrels of crude was spilled in three days before being reported and more than 10 Million US dollars was used to clean up the spill and to treat the contaminated soil. *(Source Mr. Humoon – Ministry of Petroleum - HSE):*

The sole dependency on oil revenue to run the government has led to cuts in environmental safeguards. Unfortunately, the conflict puts additional pressure on the Government to protect revenue sources by reducing maintenance costs thereby increasing the risk of accidents. By developing only the petroleum industry, the Government's inattention to developing other natural resources has and will affect the country's post-conflict progress.

The result is that drought, together with oil pollution and consequent soil and water contamination, increase the risk of conflict because affected populations lose access to their productive land and may have to migrate.

2. Forestry and agriculture

Photo 4: Charcoal production in Jebel-Lado County outside Juba. *(Source: Peter Gilruth, UNEP/EPI)*

More than 90 per cent of the country's population directly depends on forests for fuelwood and charcoal production, timber for construction and non-timber forest products for food and nutrition security. However, this resource is under pressure and is disappearing around urban centres. In addition, conflict has contributed to degradation of the environment via rapid deforestation and has prevented forests from being developed and sustainably managed to provide goods and services for future generations.[15]

The impact of conflict is that farmers in conflict-affected regions (Photo 4) are reluctant to plant for fear that their harvest will be taken by combatants. So, some are forced to move to charcoal production which is easier to transport. However, conflicts impede movement of charcoal producers, hence they concentrate production in a limited area which stunts growth of timber products such as poles for home building, which in turn negatively impacts the construction industry. This is just one example of how conflict degrades the environment across multiple sectors in South Sudan.

Photo 6: Drought / famine foods (Balanitus seeds) used by Kapoeta farmers. *(Source: Peter Gilruth, UNEP/EPI)*

Currently, conflict is the key threat to food production as it forces farmers and pastoralists to move away at times of the year that are crucial for planting and grazing, disrupts markets and reduces herd sizes. Furthermore, conflict is the key threat to marketing food products along with the poor state of roads and lack of transportation and refrigeration. Whether due to conflict or environmental conditions (natural drought and flood cycles), agriculture has been a challenge in recent years, adding to insecurity.

3. Biodiversity

South Sudan is the home of the Sudd wetland, one of scale in South Sudan. From a population of about 79,000 in the 1970s, the Wildlife Conservation Society and the South Sudan Wildlife Service estimated a population of some 2,300 in the country prior to the civil war in December 2013 (16,17,18).

The risk that conflict poses is that, as much attention is given to peace negotiations and humanitarian assistance, threats to the wildlife and biodiversity may go unnoticed.

4. Urbanization and Pollution

A driver of urbanization is the influx of refugees, internally displaced people, immigrants and returnees to urban settlements. By the end of April 2018, there were 1.76 million internally displaced South Sudanese who were forced to flee their homes but did not cross an international border.[19] These displaced populations place stress on urban centres poorly equipped to handle their needs.

The rural-to-urban migration has been accompanied by noticeable environmental damage, particularly in areas with fragile ecosystems. Large areas in most municipalities are gazetted as predominantly residential areas with little or no space for public recreation[15]. As much as half of urban waste is either dumped openly or burned (Photo 7), resulting in the proliferation of pathogens and soil or air pollution that cause respiratory illnesses among the population.