

# Chapter 48

## The Role of Climate Change in the Darfur Crisis

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**Abstract** Located in western Sudan, Darfur covers 500,000 km<sup>2</sup>, and has a population of 7.4 million. The Darfur crisis started in 2003, with a tragic cost in human life and population displacement. Climate change is the root cause of the crisis. This is not to diminish the political, socio-economic, and ethnic factors. The Darfur crisis is so complex because a multitude of factors are operative simultaneously. The impact of climate change has been well documented in several other ecosystems. The sedentary farmers of the Fur tribe and the nomadic tribes have enjoyed peaceful coexistence for centuries. The Fur and other sedentary tribes own the land and the nomads have the right to use the rangeland; when minor clashes arose, they were quickly diffused by tribal leaders.

Conflicts gradually developed from low to high intensity, fuelled by shrinkage in natural resources caused primarily by climate change. While precipitation in Northern Darfur has dropped by 30% over the last 80 years, resulting in repeated bouts of drought, livestock and human populations increased significantly. A political solution to the crisis, though essential, will not remove the underlying causes of the conflict driven by climate change. The solution is robust development of the region based on strategies of adaptation to climate change, which will reduce poverty and provide alternative livelihoods. The industrialized nations, who caused climate change, are obliged to fund such an endeavour. Lessons learned from Darfur will hopefully prevent such a tragedy from happening elsewhere.

**Keywords** Adaptation · Climate change · Conflict · Crisis · Darfur · Fur · Natural resources · Nomads

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## Introduction

Located in western Sudan, Darfur covers about 500,000 km<sup>2</sup>, between latitude 10° N and 22° N, and longitude 23°5' E and 27°45' E. It has a population of about 7.4 million. Darfur was the last addition to modern Sudan. It was annexed to Sudan in 1917 (NFC, SECS 2009).

Darfur covers a range of ecological zones from the Sahara desert in the north to the high-rainfall savannah in the south. In the central region lies Jebel Marra massif, extending for 70 miles in length and 30 miles in width, with an altitude of 1,000 m. It is blessed with fertile soil and abundant water resources.

The Fur tribe, the largest tribe in Darfur, inhabits the central belt of Darfur, including Jebel Marra massif. The Fur are sedentary farmers; other small-scale farmer tribes also dwell in this region, including Masalit, Berti, Bargu, Bergid, Tama, and Tungur. The desert most northern part of Darfur is occupied by camel herder tribes such as Zaghawa, Bedyat, Mahariya, Irayqat, Mahamid, and Beni Hussein. This area is directly impacted by desertification, primarily caused by climate change. In the southern part of Darfur live cattle herders such as Rezeigat, Habaniya, Taaysha, Maaliya, Beni Halba, Meseiriya, Daju, Birgid, Beegu, Salamaat, and Fallata (Ali 2004) (Fig. 48.1).

## Land Use and Conflict Resolution

The sedentary farmers of the Fur tribe and the nomadic tribes have enjoyed peaceful coexistence for centuries. The Fur and other sedentary tribes own the land and the pastoralists have the right to use the rangeland. When minor clashes arose, they were quickly diffused by tribal leaders. The native administration played a central role in resolving conflicts, until it was abolished by the May Revolution regime in 1970. The administration was a system of self governance established by the British, who recognized the traditional tribal system and used it in their favour. The native administration helped to collect taxes on behalf of the government, and keep the peace in remote areas that would otherwise incur high costs to administer. Tribal leaders were given limited judicial powers; this enabled them to settle minor conflicts between tribal members. More importantly, these tribal leaders were capable, in coordination with other tribal leaders, to settle inter-tribal conflicts. In this case, leaders of the tribes in question, in the presence of other respected dignitaries in the region and government representatives, would get together and work out a resolution to the satisfaction of all parties. This conflict resolution mechanism served the region very well for decades. However, the abolition of the native administration weakened the authority and influence of tribal leaders. This effective conflict resolution mechanism was lost, and no equally effective one was developed. Now the government is proposing reinstating the native administration once again. A new legislation to that effect is prepared and will soon be sent to the National Assembly, the Sudanese parliament, for enacting into law.

**Fig. 48.1** Map of Darfur

Source: Alert Net 2009



## Climate Change and The Crisis

The Darfur crisis is now the largest humanitarian crisis in the world. It is so complex because a multitude of factors are operative simultaneously. Climate change is the root cause of the crisis. This is not to diminish the political, socio-economic, and ethnic factors. The impact of climate change has been well documented in several other ecosystems. The most evident is the shrinking ice caps in the north pole, as portrayed in Al Gore's documentary, *An Inconvenient Truth*.

It is now widely accepted that climate change has caused bouts of droughts, as experienced in Darfur and other parts of Africa. British home secretary John Reid pointed to global warming as a key factor behind the conflict in Darfur, and called it a warning sign. UN secretary general Ban Ki-moon described the Darfur problem as an ecological crisis due, at least in part, to climate change. Ms Alessandra Giannini, who led a worldwide climate study conducted by Columbia University, concluded that the drying of Darfur is due to changes in global climate (Faris 2009). Jeffrey

Sachs, an economist, wrote, “The deadly carnage in Darfur, Sudan, for example, which is almost always discussed in political and military terms, has roots in an ecological crisis directly arising from climate shocks” (IRIN News 2007).

The political, socio-economic, and ethnic factors related to this crisis, have been extensively covered in print and the audio-visual media. This paper is focused on the environmental dimension of the crisis. Climate change has caused serious deterioration in natural resources. It caused desertification in the northern part of Darfur and diminishing natural resources in central and southern Darfur. This intensified the competition for natural resources between sedentary farmers and nomadic pastoralists. Deterioration in natural resources has been blamed on human activities during the 1970s and 1980s. However, examination of climatic data of Darfur points to the fact that climate change is the driving force behind deterioration in natural resources. Unsustainable use of natural resources made the situation even worse.

There has been a drastic and steady decline in rainfall over a relatively short period of time. Table 48.1 shows this decline in rainfall in North, South, and Central Darfur between the mean of 1946 to 1975, and the mean for the next 30 years between 1976 and 2005.

North Darfur, the driest of the three regions, has shown the largest decline in rainfall, amounting to 34%. Obviously this factor alone is capable of causing significant change in vegetation communities even in the absence of destructive human activities such as overgrazing, shifting cultivation, or felling of trees. It is certain that we are witnessing a major shift in climate. This alone can bring about change in vegetation composition as fewer drought-resistant species disappear, and may even lead to the disappearance of vegetation cover altogether. This is what is happening in northern Darfur at the fringe of the desert, where the encroachment of the desert is evident. It is estimated that the desert has moved southwards 100 km in 40 years (UNEP 2007). This deterioration is also manifested in areas to the south in degradation of natural resources, forests and rangeland alike. It is safe to conclude that this deterioration in natural resources, resulting in desertification in northern Darfur, is a direct result of climate change. This is not to deny the fact that overgrazing, shifting cultivation, and felling of trees exasperate the situation even further. Increase in human and livestock populations puts more pressure on

**Table 48.1** Average annual rainfall in North, Central, and South Darfur in 1946–1975 and 1976–2005

Rain gauge location	Average annual rainfall (mm) 1946–1975	Average annual rainfall (mm) 1976–2005	Reduction (mm)	Reduction (%)
El Fashir	272.36	178.90	–93.46	–34
Northern Darfur Nyala	448.71	376.50	–72.21	–16
Southern Darfur El Geneina	564.20	427.70	–136.50	–24
Western Darfur				

Source: UNEP (2007)

shrinking natural resources. Expansion in cultivation at the expense of rangeland and forests have made a bad situation worse.

## Other Factors Contributing to The Crisis

In Central Darfur, government statistics indicate a population growth of 12%, from 3 persons per km<sup>2</sup> in 1956 to 18 persons per km<sup>2</sup> in 2003. (UNEP 4.16). The total population of Darfur increased from 2,076,733 in 1973 to 4,638,203 in 1993 (Ali 2004). Because of a porous border, a significant part of this population growth is attributed to immigration across the western border, as well as from the drier regions in the north. It is estimated that livestock in North and Central Sudan has increased by 400% since 1961 (UNEP 2007). At the same time, poorer rangeland required pastoralists to cover larger areas of range to provide adequate nutrition for their livestock. This complex land-use pattern fuelled further competition for resources.

According to UNEP, in southern Darfur, land under cultivation increased by 138% between 1973 and 2000, while rangeland and closed forest decreased by 56% and 32% respectively. This expansion in cultivated land is in part due to new rain-fed large mechanized agricultural projects. However, small scale farmers under conditions of dwindling productivity tend to expand their land under cultivation to make up for deficits in total production.

It has been documented that the number and width of pastoralists migration routes between wet and dry season rangeland have been steadily decreasing. This is due to several factors. The primary factor is expansion in cultivation, both large and small projects. To compensate for decreased productivity due to drought, small-scale farmers expand their cultivated plots, cutting into these migration routes. Also due to a reduction in rainfall, farmers started to use new water harvesting techniques such as terraces, which made it possible to cultivate slopes that were not previously cultivated and were natural rangeland used by pastoralists. Another factor is the fact that pastoralists started to move in larger groups with larger herds. This has been made necessary due to lack of security and an increase in armed robbery. It is also reported frequently that due to a decrease in water resources caused by bouts of drought, farmers started to fence water sources, depriving pastoralists from access to water (UNEP 2007).

## The Crisis

As natural resources continued to dwindle, tribal conflicts increased in numbers and intensity. This, unfortunately, took place in the absence of an effective conflict resolution mechanism. Tribal conflicts have been recorded since 1932 (Ali 2004). Between 1932 and 1979, more than 40 years, there were only 11 tribal conflicts recorded. This number jumped to 13 during the decade of the 1980s

alone and further increased to 18 in the 1990s. The 1980s witnessed one of the most severe droughts in the region, which triggered famine and massive human displacement.

The previously mild conflicts evolved into a bloody conflict of tragic proportions. The Darfur crisis started in 2003, with an enormous cost in human life and population displacement. UNHCR estimated that 300,000 people may have died, and 2.7 million were displaced from their homes (IRIN News 2009).

If no action is taken, there is enough evidence that the situation will get worse. It is predicted that climate change is accelerating and will result in wide-ranging shifts in climate variables. Changes in the mean and variance rainfall and temperature are predicted that will impact food production and prices, nutrition and health (Heltberg et al. 2009).

Climate models for northern Kordofan, which is comparable to northern Darfur indicated that temperatures are set to rise by 0.5°C to 1.5°C annually between 2030 and 2060, with an average rainfall decline of 5%. The impact on food production is expected to be disastrous. Sorghum, the staple food in the region, could see a decrease in production of 70%. (HCENR 2003). This grim forecast calls for immediate and decisive action.

## The Solution

It is clear that there is mounting pressure from the international community on all parties to reach a political solution. All parties are not interested in a prolonged conflict. Therefore, it seems reasonable to assume that a political solution can be achieved in the near future. However, a political solution to the crisis, though essential to stop the bloodshed and bring a conclusion to humanitarian sufferings, will not remove the underlying causes of the conflict driven by climate change. If we make the mistake of assuming that the conflict is over by signing a political settlement, we will be surprised by the conflict, over meagre natural resources, soon flaring once again.

The solution is robust development of Darfur based on strategies of adaptation to climate change, which will reduce poverty and provide alternative livelihoods for the people of Darfur. Such a development effort should remove a significant proportion of the population from natural resource use into new jobs and activities that are more rewarding financially and help reduce pressure on natural resources weakened by decades of overuse and deterioration.

Adaptation to climate change must be mainstreamed in the policy of the central and local governments. This development initiative must put climate change adaptation and mitigation at the core of its activities. The Sudan Higher Council of the Environment and Natural Resources (HCENR) proposed five projects for funding adaptation to climate change in Sudan NAPA. Now project proposals for these have been drafted. One of them is a water harvesting and spreading project in Southern Darfur (HCENR 2007).

The World Bank, the UN, and the African Development Bank conducted a joint assessment mission for Darfur. It is composed of two tracks. One is an early recovery programme for returning the war-affected population. The second is focused on medium- and long-term needs to achieve the Millennium Development Goals. This development scheme must address the establishment of infrastructure that the region lacks. Roads, transport facilities, communication, and electricity are essential at the first stage, starting with rebuilding destroyed infrastructure. Significant effort is needed in healthcare and education.

New agriculture policy is called for in Darfur. Such policy must take into account the reality of climate change and its impacts, and the fact that farmers share the land with nomad pastoralists. New varieties of the traditional crops are needed with more resistance to drought, as well as new crops suited to the prevailing conditions. More active and focused extension is needed, aided by new improved seeds and basic agricultural tools, while benefiting from indigenous knowledge accumulated over time. Water harvesting techniques should be introduced whenever possible. Darfur agricultural products have suffered in the past from marketing problems, especially in Jebel Marra. Marketing is essential to encourage production and give farmers a fair price for their crops.

An awareness campaign should go hand in hand with the implementation of the development plan. This awareness programme would help local people understand and adopt activities of adaptation to climate change; and encourage sustainable use of their natural resources. The government decision to reinstate the native administration is a step in the right direction. A conflict resolution should be built around the native administration with support from the local government and academia.

The forests of Darfur are excessively exploited for timber and charcoal production. There is an opportunity for Darfur to use the Clean Development Initiative (CDM), and the Reducing Emissions from Deforestation and Degradation (REDD) programmes under the UN Convention on Climate Change. This will benefit the local communities financially, as they receive compensation for conserving their forests and natural resources.

Historically, women in Darfur have been more active economically, relative to women in other parts of the country. The development plan must make an extra effort to empower women and get them involved in the development activities.

For decades, Darfur has known the *shail* system, where a merchant funds cultivation operations for poor farmers, and gets paid at harvest time in kind. In such a system, the farmer is the weaker party. However, this has been the only line of credit available to the small farmers. It is time for the government to step in and provide a system through which poor farmers can access credit from lending institutions outside the traditional culture which deprives them from credit. It is time to try a small loan programme to fund farmers and pastoralists, and boost local development.

It is true that the poor countries who have not caused climate change will be the ones to suffer most from its impact. There is an ecological debt to humanity on the back of the developed countries that caused climate change. These rich countries

will hopefully be willing to fund a development programme in Darfur. Donors pledged billions at the end of the civil war in southern Sudan. They will hopefully do the same now for Darfur.

## Lessons Learned

Valuable lessons must be learned from the Darfur crisis. The UNEP report (2007) warns that Darfur “holds a grim lesson for countries at risk”. Faris (2009) wonders if Darfur is the canary in the coalmine. Other areas in Africa where livestock herders and farmers compete for dwindling resources at risk must now take notice. Some experts say that Darfur represents an emerging pattern of conflicts over resources, and it is not possible to separate climate change from population growth and rising needs for resources (Brawn 2009). In a working paper to the War College in Newport, RI, Yackle states, “Africa hinges upon mitigating the effects of climate change to prevent future conflicts such as Darfur”.

Mild resource-based conflicts were reported in the Gedarif and Blue Nile states of Sudan, during 2005 and in the preceding years. However, there is no room for complacency. The status of these conflicts is similar to the situation in Darfur during the decade before 2003. These too can escalate into violent conflicts, as experienced in Darfur. In Darfur’s situation, the governments, local and central alike, did not heed repeated warnings, and denied the existence of a problem or underestimated the conflict, until it evolved into the tragedy we see today (Babiker et al. 2005).

Low intensity conflicts over natural resources across Africa should be a reason for concern. This is a very important lesson to learn from the Darfur tragedy. Shrinkage in the natural resource base caused by climate change can gradually turn mild conflicts over resources into violent ones if necessary measures, including mitigation and adaptation to climate change, are not implemented. The lessons learned from Darfur will hopefully prevent such a tragedy from happening elsewhere in the future.

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