

CLIMATE CHANGE, MIGRATION AND CONFLICT OVER AGRICULTURAL LAND RESOURCES IN THE WEST AFRICAN SAHEL

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ABSTRACT

The relationship between climate change, migration and conflict is complex and interlinked and this forms the crux of this work as it relates to the West African Sahel. The West African Sahel which includes the Northern fringes of Nigeria is a region known for its fragile ecosystem resulting from an established history of climatic vagaries and variability. This makes the region more prone and vulnerable to the impacts of climate change. The paper noted that the West African Sahel has shown various changes especially in terms of rainfall, of which inter-annual variability is very high. It has witnessed increase in temperature and increased dry spells resulting in reduced water availability and increased land degradation. The consequence is agricultural land resource dearth. This has triggered off migrations by the various occupational groups to areas of greener pastures giving rise to competition and conflict over the available agricultural land resources especially among the sedentary cultivators and between them and the nomadic herdsman. Among the measures to curb such conflicts, it is opined that adaptation policies and strategies should gear towards reducing livelihood vulnerability, promoting alternatives, improving the quality and quantity of natural resources and decreasing resources competition which will all culminate in reducing forced migratory pressures and minimizing the threat to conflicts.

KEYWORDS: Climate change, migration, conflict, Agricultural Land Resources, West African Sahel.

1. INTRODUCTION

It is presently established that the earth has become warmer over the last century. The average surface temperature of the earth has increased during the twentieth century by about $0.6 + 0.2\text{oC}$. It is warmer presently around the world than at any other time during the past 1000 years, with the possibilities of warmest years of the previous century occurring within the past decades (Obioha 2008). Africa is acclaimed to be the most vulnerable continent to climate change because three quarters of the continent is tropical, it's dependence on climate change sensitive agriculture and finally socio-economic gaps in governance, government financing, high rates of poverty and growing population which all expose the region to high vulnerability to climate change (Garcia, 2008). Worse still the West African Sahel, owing to its fragile ecosystem and climate vagaries still stands at a higher risk of climate change impact. The region has been identified as one of the most vulnerable regions to climate change due to its proximity to equator, its already high temperatures

and low rainfall, the high reliance of the local population on rain-fed agriculture, high population density and low adaptive capacity (muhammed, 2011). It observed that the West African Sahel has witnessed various changes especially in terms of rainfall of which inter-annual variability is very high. It has equally witnessed increases in temperature and increased dry spells. This consistent reduction in rainfall with increasing temperature and dry spells has led to a reduction in the natural regeneration rate of land resources that has impacted negatively on livelihood of which agriculture is the chief.

The decreasing availability of physical, environmental and land resources such as clean water, good agricultural land for arable and animal husbandry has resulted in a condition of natural resources scarcity triggering migration and the follow up of competition and conflicts over available land resources among sedentary arable farmers and between them and the migratory herdsmen. The consequences of such conflicts have many a times been disastrous and bloody. The Northern fringes of Nigeria especially the north east which fall into this region have not been an exception and have had her own share of the conflicts arising from climate change.

This paper therefore examines the role climate change has played and continue to play in the scarcity of agricultural land resources, the struggle and scramble for same and the consequent instigation of migration and conflicts among crop farmers and between crop and livestock farmers in the West African Sahel which includes Northern fringes of Nigeria. It contributes to keeping the consciousness of the need by various stakeholders to work assiduously towards mitigating the negative impacts of climate change on agricultural land resources as it touches on migration and conflicts, and makes a difference by discussing some parts of Northern Nigeria in the context of the West African Sahel. The rest of this discourse is presented in the following sections:

Location, composition and climate characterization of the west African Sahel. Climate variability and change; Climate, Environment and Migration; Climate change – related Migration and conflicts.

2. Location, Composition and Climatic Characterization of the West African of Sahel

The name “Sahel” is derived from the Arabic word Sahil and means “border of the desert”. The Sahel covers nine countries close to the Sahara desert. These include Burkina Faso, Mali, Guinea Bissau, Mauritania, Niger, Chad, Cape Verde, Senegal and the Gambia. (Fig.1) The region borders the Sahara desert to the north. The West African Sahel region is a semi-arid area that runs from the Atlantic Ocean eastward to Chad, separating the Sahara Desert to the north and Sudanian Savana to the south. It has a total area of 5.4 million km² and a population of almost 60 million. Its vegetation is primarily composed of savanna typical bushes, grasses and trees with increasing density from north to south, representing the change from semi-arid grasslands to thorny Savanna (Sissoko et al 2011, Dube et al 2016, USAID, 2017). The region is one of the poorest and most environmentally degraded in the world, and is considered one of the world’s most vulnerable region to climate change (USAID, 2017).

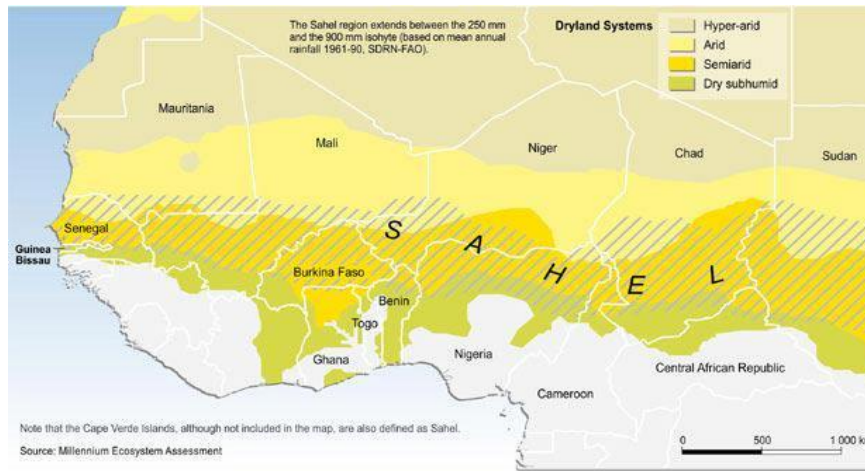


Fig. 1: Map of West Africa, showing the 'Sahel', a semi-Arid region on the 'shores' of the Sahara.

The Sahel has a hot, semi-arid climate characterized by very high temperature year-round; long, intense dry season from Oct–May; and a brief, irregular rainy season linked to the West African Monsoon. Mean temperature range 21.9 – 36.4°C, with substantially cooler temperatures in the mountainous regions on northern Chad, Niger and Mali and coastal zone of Mauritania. Mean annual rain varies from year to year and decade to decade, but generally is lower in the north (100 – 200mm) than in the south (500 – 600mm) and is limited to the summer months of June – September. The length of the rainy season ranges from one to two months in the north and four to five months in the south. In the winter (November – March), the dry dust-laden Harmatan trade winds blow from the northeast to the southwest, these induce desert-like weather condition (i.e. low or very little cloud cover, no rainfall) and can produce severe dust/sandstorms (USAID 2017). Prolonged dry season (up to 10 months annually) with high evaporation rates rotate with short rainy seasons, but regularity is not assured (Sissoko et al, 2011).

3. Climate Variability and Change

The climate trends in the Sahel region are in line with the rest of West Africa where rainfall data shows a marked decline of precipitation from 1960s (Dube et al, 2016). This implies that the region has encountered more droughts since the 1960s and 1990s. Sissoko et al (2011) estimate that between that 1960s and 1990, there was a decline of between 20% and 40% in precipitation in the region. This led to a re-classification of some regions in the area from semi-arid to arid from sub-humid to semi-arid. This can be considered as the most dramatic example of worldwide multi-decadal climate variability (Diallo, 2000; Hume 2001). According to USAID, (2017) in the 1970s and 1980s, the region experienced the most dramatic drought observed in the 20th century, with a 30% decrease in rainfall, initially attributed to human mismanagement of land resources but present studies strongly show that ocean warming and air pollution from human activities played a major role in the drying of the Sahel. Although the Sahel has seen a recovery in rainfall since the 1980s, cumulative precipitation has not returned to the pre 1960s levels and certain characteristics have changed: rainfall events appears to be less frequent and have a shorter duration with greater intensity (Held, 2016, Nickolson 2013, FAO 2008). Fig 2: below shows Sahel precipitation anomalies from 1900 – 2010 as adapted from USAID 2017.

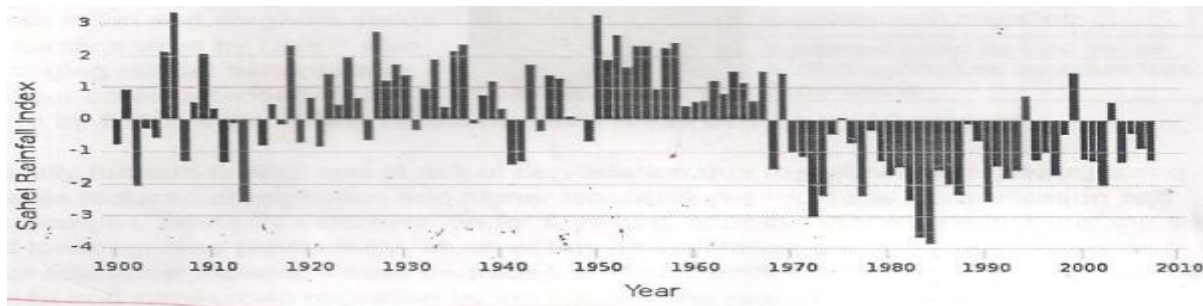


Figure 2: Sahel precipitation anomalies, 1900-2010

Equally USAID (2017) made a summary of historic climate trends and projected climate changes in West African Sahel as presented below.

HISTORICAL CLIMATE

Historic climate trends include:

- Average temperature increases of 0.6°–0.8°C between 1970 and 2010 – slightly higher than the global average.
- Increase in number of warm days/nights and decreased number of cold days/nights.
- Overall reduction in cumulative rainfall. From 2000–2009, average rainfall was below average in Burkina Faso by 15%, in Chad by 13%, in Mali by 12%, and in Niger by 8%.
- Lengthening of the dry season.
- Growing climate divide between Eastern (Niger, Chad) and Western Sahel (Burkina Faso, Mali, Mauritania) with less rainfall in the west.
- Increase in frequency and severity of extreme rainfall events and flooding.

FUTURE CLIMATE

Projected climate changes include:

- 3° to 6°C rise in average temperatures by 2100, with +3°C in the coastal areas (Mauritania) and +4°C in Continental Sahel (Mali, Chad, Burkina Faso, Niger).
- Maximum warming affects summer months (June–September) and min. temperatures
- Uncertain precipitation projections due to high inter-annual variation, but inter-annual and spatial variability are expected to increase.
- Reduced duration of rainy season, with increased extreme rainfall events in the south.
- Decrease in frequency of days and nights that are considered ‘cold’; in much of the region ‘cold’ nights will not occur at all by the 2090s.
- Sea level rise in Mauritania of up to 14.4cm by 2050 and 40cm by 2100”.

The sum is that there has been visible changes in climate as evidenced by increases in temperature over the years, decreasing cumulative rainfall, lengthening of dry season with more sustained changes in the future as projections show which of course have far reaching implications on agricultural land resources in the region and the corollary of ethnic conflicts over the remaining scarce agricultural land resources.

4. Climate, environment and migration

Migration has been a way of life for farmers, herders and fishermen in the Sahel region. Seasonal

and circular migration can be considered as traditional positive adaptation strategies to climate variability in the areas (OECD, 2009, Warmer et al, 2009). Herders typically graze their livestock in the north during the wet season and move south during the dry months. The Fulani ethnic group in West Africa, for example have long used migration and the nomadic herding of cattle, goats and sheep as an adaptation strategy against seasonal climate variability. Some farmers and herders in the region also move in search of short-term employment to supplement income and diversify skills (Bleibaum, 2009). This seasonal labour migration creates income diversification through the transfers of funds, knowledge and skills to recipient communities and equally a source of income to many poor rural families, and as such, an important element in their resilience to economic and environmental shocks and stresses (UN Population Division 2011).

Isolating socio-economic motives from climate change in the decision to migrate is difficult but according to UNEP (2011), the working definition of environmental migrants' used by 10M is useful in forming the parameters; environmental migrants are This broad definition encompasses different forms of migration, from traditional adaptation to changing environmental conditions to forced migration as livelihood groups fail to adapt. A study commissioned by European commission found among others that migration occurs when livelihoods cannot be maintained, especially when agriculture or herding is severely affected by environmental degradation or extreme events (UNEP 2011).

It is important to re-emphasize here that the region as already shown in previous sections of this work has long been subject to considerable climate variability unrelated to anthropogenic climate changes. Rainfall varies sharply across the region, with differences of more than 1000mm over a North – South distance of 750km. There can also be a variation of more than 30 percent in the length of the rainy season from one year to the next (UNEP & WAC 2006). Specific livelihood strategies have developed in the region in response to this variability. Changes in climate, such as greater rainfall variability or rising temperatures, affect the availability of natural resources and increase vulnerabilities such as food and water security (UNEP 2011). Example of such changes is found in the drying of Mali's Lake Faguibine in the 1970s, which forced more than 200,000 farmers and fishermen to abandon their traditional livelihood practices. Similarly fishermen in Nigeria's HadejiaJama' are flood plain have been forced to migrate to other floodplains, river basins, dams and lakes. One such destination point has been Burkina Faso's lake Bagreto which more than 10,000 people have migrated to since 1994 bringing the population to an estimated 162,000 inhabitants in 2009 and it continues to receive high rate of migrants (SFLP N.D). While the environmental and natural resources can act as push factors, cities and urban areas provide strong pull factors, with economic opportunities playing a major role in labour migration. Extreme events such as floods often have devastating consequence to natural resource – dependent livelihoods. Flood can result in the loss of livestock, farmland and crops, houses and critical infrastructure including water supply systems and irrigation networks (Armaetal 2010).

Furthermore, the impact of flooding is exacerbated in the region by the low absorption capacity of the soil which degrades the land and washes away the top soil. As a result floods can have both immediate and lasting effects on food security, lead to significant losses of income for both farmers and herders and act as triggering events, contributing to migration by destroying homes and critical infrastructure (UNEP 2011). In 2009, intense flooding in the region affected some 700,000 people

and killed more than 150 (OCHA 2009). Some 150,000 people lost their homes in Burkina Faso alone, after 35 percent of the annual 750mm rainfall average fell in just 12 hours in the area of Ougadougou (OCHA, 2009). While sudden onset events can cause very large scale movements of population – over 20million people were displaced by sudden onset climate related disasters in 2008 alone. These movements tend to be relatively short term and localized with most people returning as soon as possible to rebuild their homes (UNEP 2011).

5. Climate change - related migration and conflicts

Migration and conflicts are most often the result of complex issues. Changes in climate, and their effects on natural resources are just one such factor. A combination of economic, social and political factors contributes to any decision to migrate and similarly influences conflict related outcomes (UNEP 2011). In this write-up we focus on climate change related migration and conflicts. Changes in climate such as greater rainfall variability or rising temperatures affect the availability of natural resources and increase vulnerability such as food and water security. Livelihood in the region have long adapted to high rates of climate variability, using migration as an effective coping mechanism. In some instances, however, climate variability has led to conflict due to limited resource availability and access. Changes in the natural environment have led northern pastoralists to push further southwards into region used by sedimentary farmers. At the same time, increasing demand for food has meant that farmers have expanded cultivation into lands used primarily by pastoralists. Such changes have led to greater competition, tensions and violent conflict between livelihood groups. Such conflicts have occurred in Niger between their pastoral and agricultural population. In Nigeria, the Fulani herders from the north are remaining in the south for longer periods, or even becoming sedimentary. This has led to increased pressures on farm lands and local resources resulting in violent conflicts with local farming hosts in the south (Azuwike ND). It is equally reported that erratic rainfall and ongoing drought have forced pastoralists to alter traditional migratory corridors in search of new seasonal watering holes and rangelands leading to conflicts. While farmers and pastoralists historically worked together effectively, increased competition and conflicts is now an issue of concern between the Sahel's farming and pastoralist communities as land degradation and competition over water and land resources increased (IUCN, 2011; USAID, 2014). A key response to changes in natural resources availability by many farmers, herders and fishermen has been a diversification into other livelihood practices. Without enough fish to catch, some fishermen have sought land to raise cattle and grow crops, farmers have become livestock-keepers or fisher farmers and some herders have moved to southern pastoral lands to take up sedimentary farming. These changes have placed groups in direct competition with each other over land and water leading to conflict. This is evidenced in the conflict between the farming sonike and the herding Toucouleur communities in Mali who until reduced rainfall in the region have lived peacefully together. Likewise, competition for freshwater and coastal resources amongst traditional fishermen and newly arrived migrants is increasing and in some cases, leading to heightened tension and small-scale conflicts within the region. This is most evident in Lake Chad, which has seen significant population growth and decreasing availability of fresh water, arable land and fish. Since 1963, Lake Chad has contracted by 90 percent, down to 1,350km² from its original size of 2500km². As a result water scarcity, health issues, food insecurity and poverty have increased dramatically in the area. This region which is home to over 300 ethnic groups as well as migrant workers from other African countries has seen heightened tensions over water access between different communities and livelihood groups resulting in both migration and increasing territorial disputes. It is identified that

the shrinking of Lake Chad has contributed to conflicts in two notable ways:

First, by intensifying the frequency of contact between and among the major livelihood systems, thereby making them more competitive rather than complementary. Second it intensifies the pattern of migration as a response to the contraction of the lake. Numerous conflicts have since erupted among pastoralists and farmers and between different ethnic groups as a result of the loss of the lake and its resources (UNEP 2011).

In northern Nigeria especially the northeast, there are many conflicts which are environmentally induced. There are conflicts over grazing land, over cattle, over water points and over cultivable land. Such conflict amongst pastoralists is common and widespread in Nigeria. Environmental deterioration in land productivity and scarcity of water has contributed to the intensity and the competition and conflict (Obioha, 2008).

Similarly, many parts of central and northeast Nigeria have recorded many violent disputes between indigenous farming communities and nomads in recent years, due to increasing desertification and consequent population pressure over land in the country's northern fringes which forces grazers away from their original abode. As a result, many pastoral people have started pushing southwards in search of grazing land, accounting to a large extent for conflicts between Tivs and the pastoral Hausa-Fulani people in June 2000. Also in March, 2003, many people were killed when a group of heavily armed men attacked the town of Dumme, Borno State, an attack felt to be related to a violent dispute over grazing land in September 2002 between local people, who are mainly farmers and nomadic herdsmen. The pattern of the climate variability related conflicts in northeast Nigeria could be likened to that of "pull" and "push" drag of elastic object where there are pressure ends that are ordinarily unwilling to let go, else it would hurt. The guinea savanna farmer who is already farming close to the margins of cultivation would naturally resist any attempt of invasion of his farmland by the cattle herdsmen who are continually in search of greener pastures that are only in existence within the limit of arable land (Obioha, 2008, Fasona and Omojola, 2005). The deadly and violent attack by Fulani herdsmen particularly in central Nigeria and many other parts of Nigeria including the south has spiralled beyond proportion in the last two years or thereabout. It is however seen that the scramble for land by the Fulani nomads and cultivators themselves arising from environmental scarcity and consequent migration of people to where there is a greener pasture constitute the underlying factors of the deadly and violent conflicts. The need therefore to take necessary measures to forestall such conflicts and improve peace and livelihood need no over emphasis.

6. CONCLUSION/RECOMMENDATIONS

The issue of climate-change related migration and conflict is clearly evidenced and so, undeniable. Climate change has negatively impacted on agricultural land resources of the West African Sahel through increased rainfall variability, increased temperature, drought and reduced rainfall. This has given rise to environmental scarcity and consequent competition and conflict as a result of scramble for available land resources. These conflicts are usually violent and long lasting, resulting in colossal damage to human lives and properties. Adopting the following recommendations will do much good to ameliorate the malaise. It is recommended that government and stakeholders should not only make serious and prompt efforts to stop conflicts each time they occur but should put a more permanent and sustainable structures to forestall their occurrences and equally intensify the strengthening of local indigenous existing institutions. Policies that spell out strategies for climate

change adaptation and regulate the use and management of natural resources should be crafted and implemented in such a way that its negative impacts is reduced to the barest minimum. For e.g. adaptation policies should consider whether specific adaptation projects might trigger or intensify migration and how push and pull factors for migration can be mitigated (UN 2010). Adaptation policies should be rooted in a sound analysis of how change in climate can exacerbate local conflicts by impacting access to and availability of natural resources for different livelihoods. In addition to integrating conflicts and migration sensitivities into adaptation policies, coordination with new and existing development policies and programming is paramount (UNEP 2011).

REFERENCES

- Armah, Fredrick A.; Yawson, David O.; Yengoh, Genesis T; Odoi, Justice O.; Afrifa, Ernest K. A. (2010). "Impact of Floods on Livelihoods and Vulnerability of Natural Resources Dependent Communities in Northern Ghana." *Water* 2, no. 2.120-139.
- Azuwike, O.D. & Enwerem, E. (n.d): Nigeria's changing environment and pastoral nomadism: Redistribution of pains and gains. Retrieved May 2011 from http://edocs.fu-berlin.de/docs/servlets/MCRFileNodeServlet/FUDOCS_derivate0000001383/Azuwike-NIGERIAS_CHANGING_ENVIRONMENT_AND_PASTORAL_NOMADISM-32.pdf;jsessionid=422806AC916125C80E55FA2536AB14?host.
- Bleibaum, F. (2009): Senegal: Policy Brief. EACH-FOR Environmental Change and Forced Migration Scenarios. Accessed in May 2011:
- Diallo (2000): L'effet du changement climatique sur la disponibilité de l'eau, L'agriculture et la sécurité alimentaire dans la cellule de Dori AGIDS/UVA, Amsterdam Google Scholar.
- Dube T, Moyo P Ncube M, Nyati D, (2016): The impact of climate change on Agro-Ecological Based livelihoods in Africa; A Review. *Journal of sustainable Development* 9 (1)
- FAO (2008): Atlas on Regional Integration in West Africa
- Fasona M. I. and Omojola, A.S (2005): Climate Change, Human Security and Communal clashes in Nigeria. A paper prepared for Human Security and Climate Change conference, Asker, Oslo 21-23 June 2005.
- Garcia, D (2008): The Climate Security Divide Bridging Human and National security in Africa. *African security Review* 17(3)1-7.
- Held I. (2016): Sahel Drought
- Hume M (2001): Climatic perspectives on Sahelian Desiccation: 1973 – 1998 *Glob Environ change* 11:19 – 29 Google scholar
- IUCN (2011): Building Climate Change resilience for African livestock in sub-saharan African.
- Mohammed, A. Ben (2011): Climate Change risks in Sahelian Africa. *Regional Environmental change* 11 (1), 109-117.
- Nicholsons (2013): The West Africa Sahel
- Obioha, E (2008): Climate Change, Population Drift and Violent Conflict over land Resources in Northeast Nigeria. *Journal of Human Ecology*, 23(4): 311-324.
- Office for the Coordination of Humanitarian Affairs. (OCHA) (2009, 11 September). Burkina Faso Flash Appeal 2009. Humanitarian appeal, Consolidated Appeal Process. Retrieved June 2011 from <http://ochaonline.un.org/humanitarianappeal/webpage.asp?Page=1809>.
- Organization for Economic Co-operation and Development. (OECD) 2009, January). Climate change in West Africa: Sahelian Adaptation Strategies. SWAC Briefing Note 3. OECD. Paris. Retrieved May 2011 from <http://www.oecd.org/dataoecd/33/39/4213680.pdf>.

Scarcity_LowRes.pdf.

Sissoko K, Kuelen H, Verhagen J, Tekken V, Battaglini A, (2011): Agriculture, livelihoods and climate change in the West African Sahel. Reg. Environ. Change 11 (1): S 119 – S125.

Sustainable Fisheries Livelihoods Programme.(SFLD) (n.d): Fisher-farmers or farmer-fishers? Rural livelihoods on lake Bagre and lake Kopinga, BURKINA FASO. Retrieved May 2011 from http://www.onefish.org/cds_upload/1071664356450_Pov-BriefBurkinaFaso.pdf.

Taenzler, D. Hammill, A & Matthew, R. (2011). Climate Change and Peacebuilding. UNEP Geneva. The United Nations Interagency Framework Team for Preventive Action. (2010). Environmental Scarcity and conflict: A guidance note for practitioners. UN Interagency Framework Team for Preventive Action. New York. Retrieved May 2011 from www.unep.org/conflictsaddisasters/Portals/6/ECP/4Page_

UN Environment Programme & World Agroforestry Center (WAC) (2006). Climate Change and Variability in the Sahel Region: Impacts and Adaptation Strategies in the Agricultural Sector ICRAF & UNEP Nairobi.

UNPEP (2011): Livelihood Security, Climate Change, Migration and Conflict in the Sahel.

USAID (2014): Climate Change and Conflict in the Sahel: Findings from Nigeria and Burkina Faso.

USAID (2017): Climate Change Risk Profile-West African Sahel. Regional Fact Sheet.

Warner, K, Ehrhart, C, de Sherbinin, A. Adamo, S. & Chai-Onn, T. (2009). In search of a shelter: mapping the effects of climate change on human migration. CARE, CIESIN, UNHCR, UNU, World Bank.

[www.each-for.eu/document/D_2444 PB Senegal.pdf](http://www.each-for.eu/document/D_2444_PB_Senegal.pdf)