

Developmental Dynamics

Transforming Societies for Sustainable Futures

**A Festschrift in Honour of
Professor Piyadasa Ratnayake**



Edited by **Saliya De Silva**

This festschrift in honour of Professor Piyadasa Ratnayake is being published on the eve of his retirement from Saga University, Japan in March 2017. The research articles here have been contributed by his students, friends and well-wishers. The authors are responsible for the views, opinions and arguments presented, methodologies used, and data analyzed in these articles. Any shortcomings found in the articles are the responsibility of the authors, not the editor or the Economic Association of Saga University.

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PART TWO – Sectoral Policies and Strategies

- | | | |
|----|--|-----|
| 07 | Role of Agriculture in Eradicating Poverty in Developing Countries
<i>J.W.D. Somasundara</i> | 163 |
| 08 | Price Transmission along the Food Supply Chain: An Analysis of Price Transmission of Selected Agricultural Commodities in Sri Lanka
<i>Jeevika Weerahewa and Pradeepa Korale Gedara</i> | 181 |
| 09 | ASEAN Regional Food Supply Chain Development: A Study of Trade Partner Logistics on Singapore Food Trade
<i>Worawan Toommongkol</i> | 201 |
| 10 | Poverty Reduction for Thai Traditional Rock Salt Producers
<i>Chollada Luangpituksa</i> | 225 |
| 11 | Mining Related Employment Levels and Economic Activity in Developing Economies Since 2008: Examples from the Economies of China, India and South Africa
<i>Kenneth E. Jackson</i> | 245 |
| 12 | Postwar Tourism and the Institutional Paradox in Sri Lanka
<i>Poornika Kumari Seelagama</i> | 261 |

PART THREE – Technical Policies and Strategies

- | | | |
|----|--|-----|
| 13 | Money Demand in Sri Lanka: A Co-Integration Analysis
<i>Champika Dharmadasa and Makoto Nakanishi</i> | 279 |
| 14 | Effect of the First-Car Scheme on the Price of Second Hand Cars in Bangkok
<i>Sanha Hemvanich and Neadvadee Chamroon</i> | 303 |
| 15 | Occupational Issues of Climate Change: Perceptions of the Workforce in Food Manufacturing Industry in Sri Lanka
<i>Chinthaka Karalliyadda and Saliya De Silva</i> | 323 |
| 16 | Climate Change Induced Migration and Conflicts in African States
<i>S. L. Tilakasiri, R. M. Olanrewaju and A. A. Salami</i> | 337 |

Foreword

This festschrift in honour of Professor Piyadasa Ratnayake is a collection of essays from his colleagues, friends and students. The felicitation volume and the essays it contains grew out of the inspiration drawn from Professor Ratnayake's rich academic work over the past several decades. The contributors must also have been inspired by recollections of the pleasant times they have spent with Professor Ratnayake over the years. Edited by his student, colleague and dear friend, Professor Saliya De Silva, this collection of essays is released to correspond with Professor Ratnayake's retirement from Saga National University after almost three decades of distinguished service as a teacher and researcher in development economics and related disciplines and as an academic administrator and Head of Department. It is with a sense of immense pleasure, combined with nostalgia arising out of many weeks and months spent together in the past with Professor Ratnayake (Piya for affectionate reference), that I accepted Saliya's invitation to write this Foreword for the felicitation volume. Kalyani and I will always remember the very pleasant times we spent with Piya – sometimes with his family – in Kyoto and Saga as well as in Kotte, Gampaha and Kiribathgoda in Sri Lanka.

My association with Professor Ratnayake began during the time he was a doctoral student at Ryukoku University in Kyoto. His university-appointed supervisor, Professor Hisashi Nakamura, who I have known since the 1960s, introduced him to me. With Prof. Nakamura's good will and Piya's request, I was informally invited to read and comment on Piya's doctoral dissertation. I now look back on this invitation as a great opportunity and privilege. The academic association and personal friendship which began this way continued for decades, becoming stronger every passing month leading to a life-long friendship between the two of us. I am also thankful to Professor Ratnayake for proposing to Saga University to invite me to be a Visiting Professor for one year and a half in the mid-2000s.

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16. Climate Change-Induced Migration and Conflicts in African States

S. L. Tilakasiri, R. M. Olanrewaju and A. A. Salami

Introduction

Climate change, one of the biggest global environmental challenges today, is the change in the average weather conditions in the atmosphere over a considerable length of time. It is attributed to natural events and anthropogenic (human-related) activities on the lithosphere and hydrosphere that alter atmospheric composition and variability that have occurred in a comparatively recent time period. Migration refers to the movement of people from one place to another, which leads to an increased growth of population in the receiving area. Emigration lowers the growth rate of population in the source region.

There has never been absolute stable climate conditions in the history of mankind. Swings and variations in climate conditions have been recorded in history books and other relevant literature. Early human societies enjoyed relatively stable climate conditions before the industrial revolution of 18th and 19th centuries and the acceleration of industrialization and urbanization. Early human societies, which relied on roots, fruits and game to survive, had many propensities to migrate. This was because they lacked the capacity to mitigate the consequences of climate change and needed to go to where food was available. With the intensification of industrialization, population explosions and urbanization, climate change was exacerbated by greenhouse gas emissions from industries and homes, particularly carbon dioxide (CO₂), which causes global warming. Studies have shown that global climate events in prehistoric times as well as events in more recent times have also led to general migration and population pressures.

There is evidence that climate change, whether human induced or natural, precipitates or exacerbates environmental problems and disasters such as

erosion, floods, tropical cyclones (hurricanes and typhoons), droughts, desertification, etc., which can kill people, displace them or force them to migrate to other areas. Climate change has the potential to engender conflicts and dramatically increase the existing staggering population of refugees in Africa. There is strong evidence that climate change may cause scarcity of basic resources like food, fresh-water supplies, arable land for agricultural activities and habitations that sustain life for people around the world. The problem is especially acute in African countries which are already vulnerable to climate variability and have least capacity to respond. Some counties such as those in the Sahel (a semi-desert region south of the Sahara in western and central Africa) have already suffered from severe environmental degradation.

Harsh climate change coupled with the inability of the Least Developed Countries (LDCs) to mitigate the impacts of environmental problems associated with it may encourage population movement, spawn conflicts and aggravate existing tension of refugees in LDCs, especially in Africa. Though Africa is the least responsible continent for green houses gas emissions, it is almost universally seen as the continent most at risk to climate-induced migration, refugees and conflict --- a function of the continent's reliance on climate-dependent sectors (such as rain-fed agriculture) and its history of resource, ethnic and political conflict (Brown and Crowford, 2009). This paper focuses mainly on environmental stress-induced migration and how this migration tends to generate conflicts in receiving areas. Another important aspect of this study is to attempt to beam a searchlight on the root cause of some conflicts in Africa. There is empirical evidence that implicates climate change in some conflicts on the African continent.

An illustration of how climate change occurs and the two major pathways through which climate change could generate conflicts is shown in Figure 1. The model portrays the interlocking and symbiotic relationship between climate change, migration, conflict and refugees. It attempts to give an overview picture of the features and ideas of the paper. The 'Magic Box' which is the 'Main Brain' of the model is the place where inputs from

natural forces and human activities are processed into actual climate change.

There are three assumptions about this 'Magic Box'. The first assumption is that not all inputs it receives produce climate change. Some of the inputs die off during processing. The second assumption is that the inputs are diluted during processing, thereby producing less severe, relatively short-term symptoms of climate change such as drought, landslides, desertification, etc. The third assumption is that when inputs from natural forces and human activities are received at the same time, they clash and the magic box generates intense heat during the processing which produces a devastating climate change events like tropical cyclones and has the potential to cause long-term crises such as ocean current shifts and the melting of polar ice. The two causal pathways from environmental stress to migration, and to conflict are: first, environmental problems may lead to emigration directly. Migration caused by environmental factors tends to generate social tensions and sporadic violence in receiving areas. Second, environmental stress may lead to resource conflicts, and these conflicts tend to produce refugees.

Climate Variability and Climate Change

Weather is the state or condition of the atmosphere at any place during a particular time over a certain period as shown by various meteorological phenomena, including atmospheric pressure, temperature, humidity, rainfall, wind speed and direction and cloud cover. Climate is defined as the physical characteristics of the troposphere of an area based on analysis of its weather over at least 30 years.

According to Salami (2016), the terms "climate variability", "climate variations" and "climatic fluctuations" are used to express the inherent variability of climate. Climate is not fixed or static but rather dynamic and changing. Climate trends occur only when fluctuations or variations in climate follow a trend over a period of time. The fluctuation may be cyclical in nature and give rise to climatic cycles. Over a long period of time, climate fluctuations may be such that a shift in type of climate over a given area occurs, we then say that is a change in climate, or climatic change (Ayoade, 2003). Similarly, climate variability can be referred to as variations in the prevailing state of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system, or to variations in natural or anthropogenic external forces, whereas climate change indicates a change in either the mean state of the climate or in its variability, persisting for several decades or longer. Climate change includes changes in average weather conditions on earth, such as a change in average global temperature, as well as changes in how frequently a region experiences heat waves, droughts, floods, storms and other extreme weather¹.

Climate Change-Induced Migration in African States

Whether permanent or temporal, internal or external-migration has always been one possible coping strategy for people facing environmental

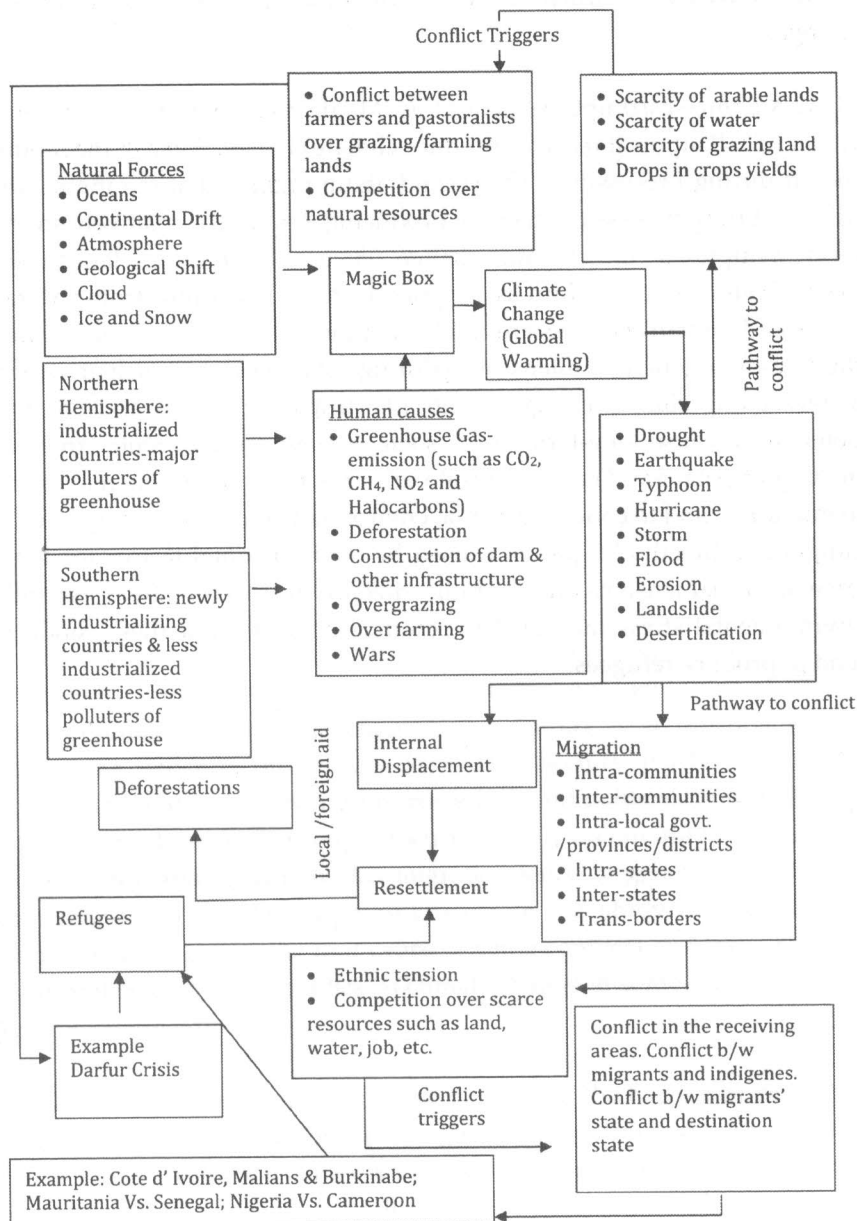


Figure 1: Model of Climate Change Migration, Conflict and Refugee Nexus

¹ www.ccir.ciecin.columbia.edu/nyc

problems. Faced with a yet unimagined scale of environmental change, migration may be "an adjustment mechanism of first resort or a survival mechanism of last resort" (Warner, 2008). In the past, environmental disasters have displaced staggering numbers of people and caused tens of thousands to migrate from the affected areas. These kinds of events have prompted the International Organization for Migration (IOM) to define environmental migrants as:

... persons or groups of persons who, for compelling reasons of sudden or progressive change in the environment that adversely affects their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and move either within their country or abroad (Warner, 2008).

Environmental change can contribute directly to migration by pushing people out of uninhabitable areas. Catastrophic events and disasters-such as hurricanes and floods-can serve as an immediate push; long term change, such as desertification, can lead to a decline in living standards that increase the cost of staying versus leaving (Gleditsch, 2007). Climate change is expected to cause global changes in climate patterns which will have a net negative effect on populated regions of the world. In addition to mean increases in temperatures and sea levels, a more worrisome trend may be changes in extremes of temperatures, precipitation, and sea levels (IPCC, 2007), which are likely to cause increased climate-induced migrations (OECD, 2009).

The issue of global warming rose high on the political agenda in 2005-2007 because of a string of warm years, massive melt-offs of Arctic ice, high oil prices, and the devastation caused by Hurricane Katrina. Unfortunately, the international community has had little success solving problems associated with climate change (Goldstein and Pevehouse, 2008). Since 1988, hundreds of atmospheric scientists from around the world have organized several UN agencies to study global climate change. The team known as the Intergovernmental Panel on Climate Change (IPCC) stated in 1995 its belief that global climate trends are "unlikely to be entirely due

to natural causes", that humans are to blame for at least part of the problem and that the consequences are likely to be very harmful and costly (Kegley, 2007).

By 2100, according to some estimates, global temperatures may rise by between 1.1 degrees to 6.4 degrees Centigrade if nothing is done. It is very possible that within a few decades the polar ice caps will begin to melt significantly and cause sea levels to rise by as much as few feet. Such a rise could flood coastal cities and devastate low-lying areas such as the heavily populated coastal areas of Bangladesh and China (Goldstein and Pevehouse, 2008). Climate change could also alter weather patterns in many regions of the world, causing droughts, floods, freezes, and widespread disruption of natural ecosystems. A document called the European Security Strategy notes that climate change will aggravate competition for natural resources and likely increase conflict and migratory movements in various regions (E.U., 2003).

Being part of global climate system, Africa could be affected by changes in global climate in various ways. West African countries could face more severe droughts and desertification, while countries with coastal areas could experience flooding caused by a rise in sea levels. Even with carbon fertilization, increased heat and water stress will reduce agricultural productivity significantly. The severity of drought is expected to be particularly acute in southwestern Africa (UNDP, 2007). A drop in agricultural yields is expected to aggravate existing scarcities of food. A poor supply of water in urban cities will put pressures on populations. If these occurrences happen they are likely to increase migration and the flow of refugees from the climate-disaster-hit areas.

The report of the Office of the Special Advisor on Africa on Human Security in Africa pushes the above assertion further by saying that:

Several factors account for conflict in Africa: remote sources, immediate causes, and factors that exacerbate conflict. The remote sources include the colonial heritage of authoritarian government and artificial

boundaries, conditions of widespread extreme poverty, and insecurity of basic necessities of life. Immediate causes include competition for land, oil or other natural resources; support for internal conflicts by outside actors, government policy and resource miscellaneous. Factors that exacerbate conflict can include arms imports, pressures of refugees or internally displaced persons and food scarcity (OSSA, 2005).

Research on global climate change suggests several possible mechanisms through which people may be forced out of their current habitats. Sea level rise caused by a reduction in glacial coverage may lead to the flooding of coastal areas. Low-lying, coastal regions may be evacuated as water encroaches upon human habitats. Desertification may cause people to migrate out of unproductive and water - scarce areas. Greater variability in weather patterns may lead to dramatic climate events such as tropical cyclones and extreme cold which may disrupt human settlement.

The impacts of climate change, coupled with population growth in developing countries, may exert significant pressure on cross-border and internal population movement. There is already evidence of the pressure that an adverse climate can impose for migration. Approximately 7 million people have migrated in order to obtain relief food out of the 80 million considered to be semi-starving in sub-Saharan Africa primarily due to environmental factors (Myers, 2005). Nyong (2007) notes that over the course of the twentieth century, decreased rainfall in the Sahel has pushed northern pastoralists southwards into land occupied by sedentary farmers.

Natural disasters already have had devastating impacts, for example, the two cyclones that hit Mozambique in 2000 displaced 500,000 people and left 950,000 people dependent on humanitarian assistance. Beyond the human toll (for instance, the estimated 500,000 dead from the Sahelian droughts spanning the 1960s to the 1990s), the economic losses are significant. Several hundred million U.S. dollars were lost in the African droughts of the mid 1980s, primarily in the Sahel, Horn of Africa and across the south of the continent (Boko et al., 2007 cited in Brown and Crownford, 2009).

A United Nations Environment Programme (UNEP) report quoted in The Guardian (June 23, 2007) notes that the scale of historical climate change, as recorded in Northern Darfur (a region in western Sudan), is almost unprecedented: the reduction in rainfall has turned millions of hectares of already marginal semi-desert grazing land into deserts. Desertification has added significantly to the stress on the livelihoods of pastoralist societies, forcing them to move into southern pastureland. The report further observes that environmental degradation is one of the driving forces of displacement and the environment is being further undermined by the sheer number of displaced people and refugees. The environmental impact of a refugee or displaced people camp is often high: UNEP researchers in Darfur found evidence of extensive deforestation could be found as far as 10 km from a camp; in some areas the situation was aggravated by brick-making.

According to Beniston (2004) as cited in Piguet (2008), the link between climate and human migration are not new. Droughts in the 1930s in the Central Plains of the United States --- the American Dust Bowl --- forced hundreds of thousands of migrants towards California. Droughts that struck the Sahel between 1969 and 1974 displaced millions of farmers and nomads and drove them towards the cities (Piguet, 2008). Drought in Mali and Burkina Faso in the 1970s and 1980s damaged the pastoral livelihoods of the semi-nomadic Tuareg. This resulted in many people having to seek refuge in camps or urban areas, where they experienced social and economic marginalization. Some people migrated to other countries (Meier and Bond, 2005) while others traveled to Cote d'Ivoire to find work, seek food and escape the threat of desertification caused by severe drought (Mabay, 2008).

Meier and Bond (2005) suggested that a similar scenario has played out in the Horn of Africa and may now be occurring in northern Nigeria, where low rainfall combined with land-use pressures have reduced the productivity of grazing lands, forcing herders to migrate southward into farm areas (AIACC, 2007). The village of Darak in Cameroon, 35 kilometers from Cameroon's eastern border with Nigeria, was founded in 1987 by

Nigerian fishermen who migrated there from Lake Chad, which has shrunk dramatically as a result of consecutive years of rainfall deficits. In the mid-1990s, more than 30 villages populated by Nigerian migrants (with a total population of 70,000 inhabitants) were identified in the Cameroonian part of the Lake Chad Basin (IRIN News, 2003 cited in Niasse, 2005).

Desertification is a major problem in Egypt, where sands are advancing over thousands of square hectares of land per year. Desertification is a push factor in migration, due to both loss of livelihoods and loss of habitable areas. An expert at the Desert Research Centre said that advancing sand dunes --- an aspect of desertification --- in the Western Desert of Egypt have caused the complete disappearance of some villages, such as Ganah and Moschee, whose inhabitants have been forced to move. The same phenomenon has occurred in Egypt's Eastern Desert, where an Egyptian NGO runs a study of a tribe called the 'Ababda', which have been forced out their homes by advancing sand dunes and droughts (Warner, 2008).

Governments sometimes introduce internal immigration program to fight the impact of climate change. The government of Egypt actively combats the consequences of desertification through an internal immigration scheme. According to UNDP Cairo, many people migrate to two different regions in the Western and Eastern Delta because of the Mubarak National Project (Warner, 2008).

Different kinds of environmental factors can influence migration in different ways. UNDP Cairo has also studied fisheries in the Northern Lakes of Egypt (Manzala, Maryout, Edkou and Borollos) that are polluted from agricultural wastes and sewage water (Warner, 2008). Accordingly, the quality and quantity of the fish has deteriorated severely; only the fish that can survive water pollution remain. Since these fish do not fetch high prices on the market, the revenue of the fishermen diminish and they are forced to seek better livelihoods elsewhere. Some migrate to Lake Nasser in southern Egypt and seek higher quality fish there. Others leave for Cairo and change their income activities. Those that seek new livelihoods in

fishing areas of Eritrea, Somalia, Ethiopia and Sudan risk are subject to arrest and deportation. Some fishermen have tried to escape to Europe (mainly via Malta and Italy) via boat across the Mediterranean. Some have drowned. Most of the environmental-induced migrants from Egypt are detained and sent back to Egypt.

The majority of migration experts informed on the issue say that environmental factors in Mozambique were a major cause for internal migration there. Migration experts say that environmental problems will contribute to increased migration pressures in the future especially if flooding and droughts continue to increase in frequency and magnitude. Major displacements of people that occurred along the Zambezi River valley after floods occurred there in recent years is a good example of this. Representatives from NGOs, international agencies and the Mozambique government, who have been working on disaster relief efforts, have mentioned floods as a major cause of internal displacement and resettlement in Mozambique (Warner, 2008).

Drought-induced migration in East Africa, hurricanes in the Caribbean region, and flooding in Bangladesh have been cited as cases where people have left uninhabitable regions. Such processes are expected to intensify in the future as the process of global environmental change progresses further (Salehyan, 2005).

Table 1 lists conflicts in Africa linked with large migrations of people in which environmental factors, perhaps linked to climate change, played a part. Sometimes, conflicts arise from migration inflows. Gleditsch et al., (2007) note that environmental stress may lead to migration indirectly. Resource scarcity and competition can lead to conflict within a country or region, and such conflicts may increase emigration. Grievance models of conflict argue that people will fight if they see a decline in their living conditions, particularly in relation to others. For example, people working in agriculture may be more affected by drought or flood than people in urban areas, leading to higher income inequality within societies and greater relative deprivation, sometimes triggering violence. Several studies

have found a relationship between conflict and variations in the pattern of rainfall. For example, pastoral conflicts are heightened during downturns in environmental conditions, namely lack of rain. Desertification and resource depletion in West Africa have led to greater tensions there.

Some argue that climate change is already playing a role in existing conflicts. A report in June 2007 by UNEP suggested that the conflict in Darfur has been partly driven by climate change and environmental degradation. The UNEP report warned of "a succession of new wars across Africa" unless more is done to contain dangers associated with climate change. The report concluded that "Darfur holds grim lessons for other countries at risk". In a 2007 Washington Post editorial, UN Secretary General Ban Ki-moon argued:

Almost invariably, we discuss Darfur in a convenient military and political short-hand, an ethnic conflict pitting Arab militia against black rebels and farmers. Look at it roots, though, and you discover a more complex dynamic amid the diverse social and political causes, the Darfur conflict began as ecological crisis, arising at least in part from climate change (Ki-moon, 2007).

According to Julian Borger, diplomatic editor of The Guardian, the Nuba tribe in southern Sudan, for example, has warned they could "restart the war" because Arab nomads — pushed southwards into their territory by drought — are cutting down trees to feed their camels. A UNEP investigation into links between climate change and conflict in Sudan predicts that the impact of climate change on instability is likely to go far beyond its borders. It found that climate change could produce a 70% decline of crop yields in the most vulnerable areas of the Sahel, which includes parts of southern Sudan. There are many security, environmental and developmental challenges facing Africa and climate change could exacerbate many of them.

Table 1: Environmental Migration Episodes and Conflicts in the African Continent

Origin, period	Destination	Environmental factors	Other push factors	No. moved	Conflict in Destination	Conflict intensity
1. Ethiopia: (a) Central/northern; (b) Awash river basin-Afar, 1984-1985	Ethiopia: (a) southwest, west (b) Wollo region	Drought, famines, locust invasion	Underdevelopment, government promotes cotton/sugar, overgrazing	600,000	Nomad-farmer conflict overland	Medium
2. Rwanda, rural south, center, early 1990s	Rwanda, north Zaire	Arable land/water scarcity, land degradation, deforestation	Overpopulation, food, scarcity, civil war, underdevelopment, govt. aid in north	1.7 million	Ethnic tension with colonial roots, civil war, genocide	Very high
3. Ethiopia/Eritrea 1960s-1980s	Southern Sudan	Droughts, famines	Underdevelopment, Eritrea secession, war	1.1 million	Migrant-resident clash over water and land	Medium
4. Mauritania 1960s-1980s	Senegal, Senegal river valley	Drought, soil erosion, desertification, water scarcity	Moors-African enmity, interstate war, Senegal river dam (basin) raises land values & stakes, pop. growth	69,000	Borders skirmishes, ethno-religious violence, riot	High
5. Somalia, late 1970s	Somalia-Ethiopia border region, Ogaden	Arable/grazing land degradation, water scarcity	Underdevelopment, population growth, interstate war	400,000	Migrant-resident water conflict, long-standing hostility	Medium
6. South Africa, black areas, late 1960s-1980s	South Africa, urban centres	Land degradation, deforestation, subsistence crisis, water scarcity	Repression, poverty, poor infrastructure, African unemployment, overpopulation	Up to 750,000 per year	Land squatters, social discord, violence	Medium
7. Sahel, rural areas, late 1960s-1980s	Sahel, urban region, neighboring coastal states	Drought, famines, land scarcity	Inflation, Underdevelopment, overgrazing	10 millions	Unrest in drought areas, rejection of new corners	Medium

Origin, period	Destination	Environmental factors	Other push factors	No. moved	Conflict in Destination	Conflict intensity
8. Sudan, north, south, west, 1970s-1980s	Sudan, Khartoum, central, Kordofan,	Droughts, famine desertification, deforestation, erosion	Civil war, underdevelopment, police against small farms and pastoralist, population growth	3.5-4 million early 1990	Government-migrant squatters clash, ethnic tension, nomad-landowners clash	High
9. Ethiopia, late 1970s	Ethiopia-Somalia border region, Ogaden	Grazing/arable land degradation, deforestation	Overpopulation, Ogaden war, land disparity, underdevelopment	450,000	Ethiopia-Somalia water and border dispute, resources competition, war	Very high
10. Nigeria, Jos Plateau, 1970s-1990s	Urban area, intra-regional	Soil/water/air pollution, silted rivers, land scarcity/degradation	Tin-mining, poverty, unemployment population	n/a	Ethnic discord, resources struggle, urban violence	
11. Somalia, late 1990s	Somalia-Ogaden, Kenya, Ethiopia, Djibouti	Deforestation, drought, erosion	Civil war in Somalia, population growth, overgrazing	2.8 million	No conflict	Nil
12. Kenya, Western, North, 1960s-1990s	Kenya, Rift valley, some remain in west, urban centres	Drought, land degradation, land scarcity, famine	Overpopulation, ethnic strife, inequality, unemployment	150,000-200,000	No conflict	Nil
13. Zimbabwe, southern low-land, 1980s	Zimbabwe, highlands	Drought	Unclear property rights, overgrazing, poverty, seasonal movement	n/a	No conflict	Nil
14. Tanzania, southern and northeast regions, 1950s-1990s	Usangu plains, Tanzania	Land scarcity/degradation	Overpopulation, poverty, govt. promotes commercial agriculture	84,000	Conflict	Low

Source: Adapted from (Reuveny, 2007)

The succession of conflict in Niger Delta of Nigeria serves as a good example of what might occur if there are major climate-change-induced conflicts. The region has been a theatre of a series of ecological crisis. It holds the bulk of the economic resources that sustain the public treasury in Nigeria. Yet, years of neglect and ecological devastation have left much of the region degraded and impoverished. Oil corporations dump wastes of varying toxic levels with impunity, and this is unchecked by an indolent environmental protection agency (Niger Delta Environment Survey – NDES cited in Onuoha, 2008). The resulting environmental degradation poses a threat to local indigenous communities. The contradiction of riches and poverty is a constant refrain in most conflicts in the Delta.

Conflict broke out between Senegal and Mauritania in 1988-1989 in the Senegal River Basin shared by the two countries. The tension began when the river started to recede from the adjacent floodplains due to droughts. Senegalese farmers [migrants] who went to the right bank of the river to prepare their fields were chased away by Mauritanian border guards. Senegalese authorities retaliated by sending camel herdsman --- migrant pastoralists who used to spend most of the dry season in the Sahel region of Senegal --- back to Mauritania. A few months after this, in April 1989, after a dispute between Senegalese farmers and Mauritanian herders in a territory claimed by the two countries, Mauritanian border guards killed two Senegalese farmers and held 13 others in custody. Tensions grew, and a series of skirmishes between Senegalese farmers and Mauritanian pastoralists took place along the river. A few days after this, shops run by Mauritians in small riverine towns in Senegal and in Dakar were ransacked and looted by bands of youths. In response, hundreds of Senegalese residents were killed in Mauritania. A hunt for Mauritians followed in Dakar and other big cities in Senegal: tens of thousands of Mauritians were killed (Niasse, 2005). The two countries severed their diplomatic relationships, and the situation remained tense for the rest of the year. The armies of the two countries deployed troops along the river. Exchanges of heavy artillery fire took place in October and November, 1989. In 1992, diplomatic relationships between the two countries were restored, but the wounds of the crisis remained for a longer period (Niasse, 2005).

In the 1980s and 1990s, a water dispute occurred between Cameroon and Nigeria on the southern part of the Lake Chad, in particular at the aforementioned Darak village and surrounding settlements. The tension between Cameroon and Nigeria grew after the Nigerian government supported its citizens' movement by supplying public services and deploying military and police forces in the Nigerian villages established in Cameroon territory. In addition, these villages were integrated into Nigeria's decentralized administration of its territory and became part of the Nigerian District of Wulgo, in the Local Government Unit (LGU) of Ngala in the Borno State. After a series of military clashes in the 1980s and 1990s, the two countries tried without success to solve the problem in the context of the International Court of Justice (Niasse, 2005).

In 1987-1989 conflict broke out between the Fur (a non-Arab, "black" tribe in western Sudan) and Arabs (cattle and camel herdsman, who were pushed southward of Darfur, Sudan by consecutive years of droughts and desertification) over grazing lands and water resources. Initially, such hostilities were controlled through negotiation between community leaders. In the 1970s, however, competition over fertile land and dwindling resources intensified dramatically due to the desertification of the region and lack of good governance. Traditional conflict resolution mechanisms were replaced with bloody and politicized clashes and ethnicity became a major mobilizing factor. During 1987 and 1989, twenty seven Arab tribes grouped themselves together under the nomad militia Janjawid (armed men on horses) to attack the Fur as well as other non-Arab tribes. An estimated 2,500 lost their lives and 400 villages were burned, producing tens of thousands to flee their land and become refugees².

Conclusion

This study argues that severe climate change disasters can lead to the migration of affected people to other areas. Conflicts can erupt in receiving

areas as competition over scarce resources --- exacerbated by ethnic tension and distrust --- occurs. Africa is particularly vulnerable to these kinds of conflicts because it has a low adaptation capacity to climate change hazards. It is now largely accepted that mankind has significantly contributed to climate change and environmental degradations through greenhouse gas emissions from industries and homes, especially Carbon dioxide (CO₂), which causes global warming. In this paper we have given a number of examples of ways environmental factors --- many of them linked with climate change --- have induced conflicts in Africa. The Darfur crisis in Sudan was a particularly bloody example of this. We expect the situation to get worse rather than better in the future as problems associated with climate change become more pronounced and populations affected by them get larger.

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