International Journal of Agriculture and Environmental Research

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

CLIMATE CHANGE AND MIGRATION NEXUS: ASSESSING THE EVIDENCE

OLADAYO NATHANIEL AWOJOBI

Bonn-Rhein-Sieg University of Applied Sciences, Saint Augustin, Germany

ABSTRACT

Climate change has been considered from existing literature as one of the determinants of migration. This prompted this study to assess the evidence of environmental factors vis à vis climate change influencing migration. This paper deploys the use of secondary data analysis. The unique strength of secondary data analysis is that of conducting a study among studies. For selecting the appropriate studies, the literature search was done electronically in the fields of climate change, environment and migration. The major sources of data collection include journals of environment and policy, development organizations, research centers, university publications. Climate change influencing migration has been reported in all the 13 studies that were reviewed in this study. Based on the analysis of this study, the hypothesis to be tested is: 'Climate change, ceteris paribus results in inducing internal migration. Out of the 13 sample studies selected for the study, 8 studies validate the hypothesis while the status of the remaining 5 studies is mixed. Finally, the study provides some measures to avert migration pressures due to climate change.

Keywords: Climate change, Displacement, Drought, Flooding, Migration

INTRODUCTION

Migration is often considered a general term, as the voluntarily or involuntarily movement of people from one location to the other (Kolmannskog, 2008). While most studies have postulated socioeconomic factors as the reasons for migration (see De Haas, 2011; Sprenger, 2013). Current literature has included climate change vis à vis environmental factors as also determinants of migration especially internal migration (for review, see Abebe, 2014; Goff, Zarin, & Goodman, 2012; Greenpeace, 2017; Waldinger & Fankhauser, 2015). Though environmentally influenced migration is not by means a new occurrence, however, climate change is likely to change its scale. Furthermore, environmental alteration could motivate people to migrate from affected

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

areas but where will they migrate to and what may accelerate or hinder their movement remain a source of concern (Mohamoud, Kaloga, & Kreft, 2014).

Climate change has become a new hazard aggravating the already existing political, socio-economic and environmental challenges (Abebe, 2014). The threat of people being displaced by unexpected natural disasters is 60% higher currently that it was four decades ago. At present, an average of 25.4 million people are displaced early as a result of natural disasters (Greenpeace, 2017). Climate change promotes the rise in extreme weather conditions and weather-related natural disasters, and to the increasing number of people who lose their means of livelihood and foced to escape from their homes and move to other areas. Climate change and environmental degradation are existing extremely powerful agents of migration flows (Greenpeace, 2017).

The correlation between climate change and migration is somehow complex (Goff et al., 2012; Greenpeace, 2017; Waldinger & Fankhauser, 2015). The Intergovernmental Panel on Climate Change (IPCC) in the early 1990s suggested the greatest single impact of climate change may be on human migration leading to the displacement of people by natural disasters (International Organization for Migration, 2008). However, the impact of climate change may not only be limited to humans, as agriculture and livestock have been affected by changing rainfall patterns, rising temperatures, and extreme weather conditions such as flooding and drought (Abebe, 2014; Greenpeace, 2017).

While the debate on the correlation between climate change and migration ranges on. This paper is primarily concerned with the evidence of climate change being the driver of migration from existing studies.

MATERIALS AND METHODS

This section of the paper outlines the methodological approach that was employed as well as the literature search and criteria of selecting sample studies for review.

Secondary data analysis

This paper deploys the use of secondary data analysis. The unique strength of secondary data analysis is that of conducting a study among studies. It saves researchers time because someone else has already collected the data as well as it is economical (Boslaugh, 2007; Johnston, 2017; State University of New York, 2009). In addition, “the key to secondary data analysis is to apply theoretical knowledge and conceptual skills to utilize existing data to address the research questions” (Johnston, 2017, p. 620). Despite the numerous advantages of secondary data analysis, its common flaw is that the researcher did not take part in the planning and execution of

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

the data gathering process, that is, the researcher does not know exactly how the data process was done and hence how critically the data are faced with problems such as the misunderstanding of the survey questions by respondents and low response rate (Boslaugh, 2007). The basic idea of using qualitative method vis à vis secondary data analysis is to present a concise and comprehensive picture of findings across qualitative studies that investigate the same general research topic (Timulak, 2009). The present study employs secondary data analysis and utilizes the mixture of qualitative and quantitative empirical evidence to analyze the correlation between climate change and migration.

Literature search

For selecting the appropriate studies, the literature search was done electronically in the fields of climate change, environment and migration. The major sources of data collection include journals of environment and policy, development organizations, research centers, university publications. The two prominent keywords used in searching for relevant studies are climate change and migration. Furthermore, electronic searches were carried out on literature cited in other literature already in this paper's review.

Criteria for selecting sample studies

The aim of this paper is to assess the nexus between climate change and migration. Studies have shown that environmental factors such as drought, flooding and severe heat can induce migration (Abebe, 2014; Goff et al., 2012; Greenpeace, 2017). However, Jónsson states "this does not imply proving whether or not there is a direct causal link between environmental and migratory process because it is not assumed that a 'stmulus-response' relationship exists" (Jónsson, 2010, p. 6). Inquiry in this regard would skip the intricacy of the causes of migration. Furthermore, it would constrict the scope of this field of research, as it would simply be a question of validating or fabricating a hypothesis about a causal relationship (Jónsson, 2010). While the relationship between environmental factors and migration has been considered to be complex (Goff et al., 2012; Greenpeace, 2017; Waldinger & Fankhauser, 2015). And as the debate on both concepts ranges on, Etienne Piguet (2009) "has recently suggested, is to consider the *weight* of environmental factors in migration" (Jónsson, 2010, p. 6). To investigate this, the search was narrow down to the criteria (i) climate change and migration nexus and (ii) internal migration due to environmental factors. While emphasis is laid on internal migration instead of international migration is because climate change or environmental factors mostly influence internal migration. For instance, in Mali, drought caused internal migration rather than international destinations (Findley, 1994). Furthermore, migration during natural disasters tends to be within the borders of the migrants' country of abode (Jónsson, 2010). The study by Raleigh, Jordan, & Salehyan, (2008), reveals the limitation of data on the interface between

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

climate change and international migration. While the study by Jónsson reveals that only one of the reviewed literature exclusively investigates the process of international migration within the context of environmental change, i.e., "Bassett & Turner (2007), the study of Fulbe herders in the Sudano-Guinean region, who were crossing the borders of neighboring countries" (Jónsson, 2010, p. 11). This study aims to test a hypothesis: "Climate change, *ceteris paribus* results in inducing internal migration". Table 1 presents the reviewed of selected studies that fit the push factor framework of environmental events induced migration analysis.

RESULTS AND DISCUSSIONS

Climate change is one of the factors that influence migration, especially internal migration, all the studies that were reviewed in this paper attested to the hypothesis. This paper is not limited to the focus on climate change but deals with the broader perspective of environmental factors influencing migration

Climate change induced migration: The evidence

Climate change influencing migration has been reported in all the 13 studies that were reviewed in this study (Abebe, 2014; Bhattacharyya & Werz, 2012; Gray, 2011; Greenpeace, 2017; Nansen Initiative, 2015; Schipani, 2016; Schwartz & Notini, 1994; Science for Environment Policy, 2015; Smith & McCarty, 1996; Stojanov & Novosák, 2006; UNEP, 2011; Warnecke, Tänzler, Vollmer, & others, 2010; Werz & Conley, 2012). The impact of climate change cuts across all regions of the world. In East Africa, a severe flooding in 2010 caused the displacement and relocation of 48, 000 people in Uganda and 55,000 in Kenya, Namibia, Rwanda and Zambia (Abebe, 2014). Similarly, decreasing rainfalls in Mali increased rural-urban migration, over 600,000 to 2 million people were forced to migrate to Bamako within the period of twenty years (Warnecke et al., 2010).

In Pakistan, flooding within the period of 2006 to 2014 caused most of the affected people to migrate to other cities (Bhattacharyya & Werz, 2012). While in India in 1996, sea level rise prompted the migration to other areas of 7.000 inhabitants of the affected region (Nansen Initiative, 2015). Cyclone in Bangladesh in 2016 resulted in the movement of 500,000 people to other regions in Bangladesh (Greenpeace, 2017). China is not left out among the countries that have been affected by climate change in Asia, "every year natural disasters, such as floods, drought, storms, hails, earthquakes, landslides and mud-rock flows destroy millions houses and hectares of crops in China and millions of people have to be relocated" (Stojanov & Novosák, 2006, p. 69). For instance, the Southern and Eastern China flood in 2005 forced the migration of 2.46 million people (Reuters, 2005; Stojanov & Novosák, 2006).

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

In Mexico, the effect of desertification and land degradation in 1978 resulted in the annual migration of 600,000 people to urban centers in Mexico and the US (Schwartz & Notini, 1994). Freshwater is essential for the survival of all living organisms on earth. The human bodies are made up of 60% of water and without water, human beings cannot survive more than a few days. Furthermore, "water is also an integral part of many ecosystems that support us and a myriad of other species" (McGill University, n.d.). Water scarcity due to climate change in Bolivia induced 750 families to migrate to other Bolivian villages and cities as well external migration to Argentina and Chile (Schipani, 2016). Similarly, droughts and water scarcity in the in the Western Sahel increase the migration of farmers and herdsmen to other regions with water availability (UNEP, 2011).

In the United States, climate change or environmental factors have played a significant role in the forced migration of people that are badly affected, for example, in Florida in 1992, Hurricane Andrew forced 353 inhabitants of an affected county to relocate to within and outside Florida (Smith & McCarty, 1996).

Does climate change influences migration? "The consequences of climate change will change conditions and undermine livelihoods in many areas. And extreme events and deteriorating conditions are likely to force many to leave their homes temporarily or even permanently for another village, city, region or country" (Bhattacharyya & Werz, 2012, p. 1).When threats and effects of climate change occur, migration rates increase (C. Gray & Mueller, 2012). The IPCC declares that wetter coasts, drier midcontinent zones, and sea-level rise may cause severe consequences of climate change by driving unexpected human migration (Abebe, 2014). Natural disasters such as shoreline erosion, river and coastal flooding or acute drought have displaced millions of people (Abebe, 2014; Goff et al., 2012) Adopting adaptation strategy people migrate to other safe areas (Abebe, 2014).

Rising sea-level, drought, flooding, severe heat and soil degradation have been attributed to climate change induced migration (see Abebe, 2014; Goff et al., 2012; Greenpeace, 2017). The slow change in the environment, many of which are connected to climate change, also contribute to significant migration-drift. As such, unexpected natural disasters instigate many people to migrate (Greenpeace, 2017). Migration has been considered to be induced by environmental change is expected to be predominant in areas that are the same time affected by harsh environmental challenges and are very much reliant on the environment for livelihood (Reuveny, 2007). Relying on current data on climate change-induced migration, it can be presumed that a wide-ranging forced or anguish migration related to climate change up to the present time tends to be internal (Kolmannskog, 2008). Protagonists of climate-migration theory hypothesize that changes in the environment can act as a possible contextual driver that will influence people to

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

leave their homes as environmental disasters make living in one place no longer conducive for habitation (Burrows & Kinney, 2016).

Studies have attributed economic and social-political under pull and push factors as the determinants of migration (Borjas, 1994; Karemera, Oguledo, & Davis, 2000; P. Martin & Widgren, 2002; Moore & Shellman, 2006). However, Reuveny,

> argue that environmental problems also play a role in migration. Some problems involve extreme weather events, which, so far, have tended to be idiosyncratic and localized. Other problems include accumulating changes such as rising sea levels, land degradation, and declining freshwater resources, which tend to exert relatively more permanent and dispersed effects. Underdeveloped societies are at high risk for such problems, particularly if they depend on the environment for livelihood; their voice will be ineffective in bringing about mitigation efforts (Reuveny, 2007, p. 658).

Evidence has shown that harsh climatic conditions have influence people to migrate out of the affected areas to safer zones. While existing literature focuses on climate change and internal migration, there is the dearth of literature on climate change influencing international migration (Adamo & Izazola, 2010; Findley, 1994; Goff et al., 2012; Jónsson, 2010; Kolmannskog, 2008; Koubi, Spilker, Schaffer, & Böhmelt, 2012; Raleigh et al., 2008; Waldinger & Fankhauser, 2015).

Status of hypothesis

Most literature on migration flows connected with environmental factors are of internal in nature (Adamo & Izazola, 2010; Koubi et al., 2012; Raleigh et al., 2008) Furthermore, there is limited evidence on the interface between climate change and international migration (Raleigh et al., 2008; Waldinger & Fankhauser, 2015). For instance, the number of people affected by environmental disasters has increased in recent years, however, there has been no key increase in international migration in most of the disaster-affected areas (Goff et al., 2012). Giving credence to this hypothesis, it assumes that migration during climate change is short, temporary and internal (Jónsson, 2010; Kolmannskog, 2008).

Based on the analysis of this study, the hypothesis to be tested is: 'Climate change, *ceteris paribus* results in inducing internal migration is summarized in Table 2.

Table 2 discloses that out of the 13 sample studies, 8 studies validate the hypothesis while the status of the remaining 5 studies is mixed.

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

Table 1: Environmentally induced migration

Sr. No	Study	Country/Region	Migration destinations	Support for the hypothesis
1	Abebe (2014)	East Africa	Internal	Yes
2	Greenpeace (2017)	Bangladesh	Internal	Yes
3	Bhattacharyya & Werz (2012)	Pakistan	Internal	Yes
4	Warnecke et al. (2010)	Mali	Internal	Yes
5	Nansen Initiative (2015)	India	Internal	Yes
6	Gray (2011)	Kenya	Internal	Yes
7	UNEP (2011)	Western Sahel	Internal	Yes
8	Smith & McCarty (1996)	US, Florida	Internal	Yes
9	Science for Environmental Policy (2015)	Somalia	Internal & External	Mixed
10	Schipani (2016)	Bolivia	Internal & External	Mixed
11	Werz & Conley (2012)	Niger	Internal & External	Mixed
12	Schwartz & Notimi (1994)	Mexxico	Internal & External	Mixed
13	Stojonov & Novsàk (2006)	China	Internal & External	Mixed

Note: n/a implies “not available”.

ISSN: 2455-6939

Volume:03, Issue:05 "September-October 2017"

Table 2: Status of hypothesis

Sr. No	Study	Country/Region	Migration destinations	Support for the hypothesis
1	Abebe (2014)	East Africa	Internal	Yes
2	Greenpeace (2017)	Bangladesh	Internal	Yes
3	Bhattacharyya & Werz (2012)	Pakistan	Internal	Yes
4	Warnecke et al. (2010)	Mali	Internal	Yes
5	Nansen Initiative (2015)	India	Internal	Yes
6	Gray (2011)	Kenya	Internal	Yes
7	UNEP (2011)	Western Sahel	Internal	Yes
8	Smith & McCarty (1996)	US, Florida	Internal	Yes
9	Science for Environmental Policy (2015)	Somalia	Internal & External	Mixed
10	Schipani (2016)	Bolivia	Internal & External	Mixed
11	Werz & Conley (2012)	Niger	Internal & External	Mixed
12	Schwartz & Notimi (1994)	Mexxico	Internal & External	Mixed
13	Stojonov & Novsàk (2006)	China	Internal & External	Mixed

CONCLUSION

This study assesses the correlation between climate change and migration. Using secondary data as a methodological approach, the study findings reveal that climate change is one of the factors influencing migration. Why most victims of the impact of climate change are vulnerable and displaced, there is the urgent need to address their pathetic conditions especially in developing countries where the governments lack the coordination of climate change and migration policies which are pertinent for preventing the negative impacts of these movements. As a way of averting the consequences of climate change and migration, Martin (2013) outlines some measures for policy planning. These are (i) planning for adaptation (ii) creating sustainable migration and development policies and (iii) developing new migration policies.

Migration can be effective method to cope with climate change, policymakers should develop appropriate measures help affected populations migrate in safety and dignity when migration is their last option (Martin, 2013). Climate change and migration are two universal issues that required the collective efforts of national governments and international organizations to ensure

migration both as a consequence of climate change and as an adaptation strategy itself - is effectively incorporated into their planning (Martin, 2013). Furthermore, "national governments should account for environmental migration in their immigration policies and engage with affected communities" (Martin, 2013, p. 8).

In sum, the study has been able to prove that climate change is one of the factors responsible for forced migration, while most of the victims of climate change impact have used migration as an adaptive strategy, adaption plans should not be left alone for the victims. Engaging in a concerted planning process involving the sharing of best practices and the development of guiding principles for policymaking in this area can assist stakeholders more effectively prepare for the impact of climate change on migration (Martin, 2013).

REFERENCES

Abebe, M. A. (2014). Climate change, gender inequality and migration in East Africa. *Wash. J. Envtl. L. & Pol'y*, *4*, 104.

Adamo, S. B., & Izazola, H. (2010). Human migration and the environment. *Population and Environment*, *32*(2–3), 105–108. https://doi.org/10.1007/s11111-010-0130-0

Bassett, T. J., & Turner, M. D. (2007). Sudden Shift or Migratory Drift? FulBe Herd Movements to the Sudano-Guinean Region of West Africa. *Human Ecology*, *35*(1), 33–49. https://doi.org/10.1007/s10745-006-9067-4

Bhattacharyya, A., & Werz, M. (2012). Climate Change, Migration, and Conflict in South Asia. Retrieved 27 September 2017, from https://www.americanprogress.org/issues/security/reports/2012/12/03/46382/climate-change-migration-and-conflict-in-south-asia/

Borjas, G. J. (1994). The Economics of Immigration. *Journal of Economic Literature*, *XXXII*, 1667–1717.

Boslaugh, S. (2007). An introduction to secondary data analysis. *Secondary Data Sources for Public Health: A Practical Guide*, 2–10.

Burrows, K., & Kinney, P. (2016). Exploring the Climate Change, Migration and Conflict Nexus. *International Journal of Environmental Research and Public Health*, *13*(4), 443. https://doi.org/10.3390/ijerph13040443

De Haas, H. (2011). The determinants of international migration. Retrieved from https://ora.ox.ac.uk/objects/uuid:0b10d9e8-810e-4f49-b76f-ba4d6b1faa86

Findley, S. E. (1994). Does Drought Increase Migration? A Study of Migration from Rural Mali during the 1983-1985. Retrieved 23 September 2017, from https://www.jstor.org/stable/2546820?seq=1#page_scan_tab_contents

Goff, L., Zarin, H., & Goodman, S. (2012). Climate-Induced Migration from Northern Africa to Europe: Security Challenges and Opportunities. *Brown Journal of World Affairs*, *xviii*(11), 195–211.

Gray, C. L. (2011). Soil Quality and Human Migration in Kenya and Uganda. *Global Environmental Change: Human and Policy Dimensions*, *21*(2), 421–430. https://doi.org/10.1016/j.gloenvcha.2011.02.004

Gray, C., & Mueller, V. (2012). Drought and Population Mobility in Rural Ethiopia. *World Development*, *40*(1), 134–145. https://doi.org/10.1016/j.worlddev.2011.05.023

Greenpeace. (2017). Climate Change, Migration, and Displacement: The Underestimated Disaster. Greenpeace e.V., Hongkongstraße 10, 20457 Hamburg.

International Organization for Migration. (2008). Migration and Climate Change. International Organization for Migration 17 route des Morillons 1211 Geneva 19 Switzerland.

Johnston, M. P. (2017). Secondary data analysis: A method of which the time has come. *Qualitative and Quantitative Methods in Libraries*, *3*(3), 619–626.

Jónsson, G. (2010). The Environmental Factor in Migration Dynamics: a review of African case studies. International Migration Institute: University of Oxford.

Karemera, D., Oguledo, V. I., & Davis, B. (2000). A gravity model analysis of international migration to North America. *Applied Economics*, *32*(13), 1745–1755. https://doi.org/10.1080/000368400421093

Kolmannskog, V. O. (2008). Future Floods of Refugees A Comment on Climate Change, Conflict and Forced Migration. *Norwegian Refugee Council*. Retrieved from http://spin.fon.bg.ac.rs/doc/ret/SPIN%202011/Sekcije/09ekoloski%20menadzment-pdf/901_EKO%20-%20MIGRACIJE.pdf

Koubi, V., Spilker, G., Schaffer, L., & Böhmelt, T. (2012). Environmental Change and Migration. *Swiss Network for International Studies*. Retrieved from http://www.snis.ch/~snisch/system/files/3995_final_wp_koubi_et_al-environmental_change_and_migration_1.pdf

Martin, P., & Widgren, J. (2002). *International Migration: Facing the Challenge* (Vol. 59). Population Reference Bureau Washington, DC. Retrieved from http://auth.prb.org/Source/ACF1396.pdf

Martin, S. (2013, September 1). Environmental Change and Migration: What We Know. Retrieved 12 October 2017, from https://www.migrationpolicy.org/research/environmental-change-and-migration-what-we-know

McGill University. (n.d.). Water is Life! - McGill University. Retrieved 4 October 2017, from http://www.mcgill.ca/waterislife/

Mohamoud, A., Kaloga, A., & Kreft, S. (2014). Climate change, development, and migration: an African Diaspora perspective. Germanwatch e.V. Kaiserstr. 201 D-53113 Bonn.

Moore, W. H., & Shellman, S. M. (2006). Refugee or Internally Displaced Person?: To Where Should One Flee? *Comparative Political Studies*, *39*(5), 599–622. https://doi.org/10.1177/0010414005276457

Nansen Initiative. (2015). Climate Change, Disasters, and Human Mobility in South Asia and Indian Ocean.

Raleigh, C., Jordan, L., & Salehyan, I. (2008). Assessing the Impact of Climate Change on Migration and Conflict. Social Development The World Bank 1818 H Street, NW Washington, DC 20433.

Reuters. (2005, June 26). Swollen Chinese rivers recede, but rain forecast [Text]. Retrieved 4 October 2017, from https://reliefweb.int/report/china/swollen-chinese-rivers-recede-rain-forecast

Reuveny, R. (2007). Climate change-induced migration and violent conflict. *Political Geography*, *26*(6), 656–673. https://doi.org/10.1016/j.polgeo.2007.05.001

Schipani, A. (2016, March 13). Bolivia's water people are left high and dry. *Financial Times*. Retrieved from https://www.ft.com/content/419923e0-e090-11e5-9217-6ae3733a2cd1

Schwartz, M. L., & Notini, J. (1994). *Desertification and migration: Mexico and the United States*. US Commission on Immigration Reform San Francisco, CA, USA. Retrieved from https://www.researchgate.net/profile/Michel_Le_page/publication/260197575_Desertification_and_Migration_Mexico_and_the_United_States/links/02e7e5301d2b303f3e000000.pdf

Science for Environment Policy. (2015). *Migration in response to environmental change*. Luxembourg: Publications Office. Retrieved from http://bookshop.europa.eu/uri?target=EUB:NOTICE:KHBA14006:EN:HTML

Smith, S., & McCarty, C. (1996). Demographic Effects of Natural Disasters: A Case Study of Hurricane Andrew. *Demography*, *33*, 265–75. https://doi.org/10.2307/2061876

Sprenger, E. (2013). *The determinants of international migration in the European Union: An empirical analysis*. IOS Working Papers. Retrieved from https://www.econstor.eu/handle/10419/79240

State University of New York. (2009). A Research Guide for Students and Teachers. Retrieved 27 August 2017, from http://www.esf.edu/outreach/sciencecorps/documents/researchguide_nsfgk12.pdf

Stojanov, R., & Novosák, J. (2006). Environmental migration in China. *Geographica*, *39*, 65.

Timulak, L. (2009). Meta-analysis of qualitative studies: a tool for reviewing qualitative research findings in psychotherapy. *Psychotherapy Research: Journal of the Society for Psychotherapy Research*, *19*(4–5), 591–600. https://doi.org/10.1080/10503300802477989

UNEP. (2011). *Livelihood security: climate change, migration and conflict in the Sahel*. Châtelaine, Geneva: United Nations Environment Programme.

Waldinger, M., & Fankhauser, S. (2015). Climate change and migration in developing countries: evidence and implications for PRISE countries. Retrieved from http://eprints.lse.ac.uk/64526/

Warnecke, A., Tänzler, D., Vollmer, R., & others. (2010). Climate change, migration and conflict: receiving communities under pressure? Retrieved from https://www.cabdirect.org/cabdirect/abstract/20103331555

Werz, M., & Conley, L. (2012). Climate Change, Migration, and Conflict in Northwest Africa: Rising Dangers and Policy Options Across the Arc of Tension. Retrieved 3 October 2017, from https://www.americanprogress.org/issues/security/reports/2012/04/18/11439/climate-change-migration-and-conflict-in-northwest-africa/

