

Climate Change and the Arab Spring in Egypt

How Climate Change Impacts Contributed to
the Outbreak of the Arab Spring in Egypt in January 2011

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Abstract

The Arab Spring is often perceived of as a political struggle against authoritarian regimes in the Arab world. Existing research is characterised by overgeneralisations between Arab countries and a lack of evidence for the connection between climate change and political conflict. This research focusses on the Arab Spring in Egypt specifically, and tackles the underlying factors from a more comprehensive approach. It involves an analysis of climate change impacts on the occurrence of natural disasters and resource scarcity and subsequent impacts on economic activity, food security and livelihoods of Egyptians. In addition, socio-political factors such as governance, bad neighbours and social inequalities are analysed. The analysis reveals that the interaction between environmental and political factors provides a more comprehensive understanding to why the mass protests broke out in Egypt in January 2011. The case study of Egypt shows that structural discontents require exacerbating factors to translate into mass protests. It also proves the claim that climate change is in itself not sufficient to cause political conflict.

Introduction

On 17 December 2010, Mohammed Bouazizi's self-immolation as a reaction to ongoing police corruption and underemployment in Tunisia sparked the Tunisian Revolution.¹ Bouazizi's action also marked the start of a wave of revolutionary uprisings against authoritarian governments throughout the Middle East and North Africa (MENA), commonly known as the 'Arab Spring'.² This wave of uprisings left major political changes in its wake.³ Starting on the 25th of January 2011 – on the Day of Anger – Egypt experienced nationwide mass protests for eighteen days long. As a result, president Hosni Mubarak resigned after 30 years of presidency.⁴ There is a consensus regarding the mix of major factors contributing to the social unrest of the Arab Spring, including economic deterioration, government corruption and repressive and violent regimes.⁵ However, these factors affected people's security for years before the outbreak of protests in 2011. Economic and political perspectives on the Arab Spring therefore do not fully explain why these revolutionary protests broke out.

Both in policy debate and scientific discourses on human security, environmental (in)security has been ignored.⁶ Climate change has been identified as a risk to human security due to the physical impacts of sea-level rise, rising temperatures and natural disasters on societies.⁷ Climate change impacts function in positive feedback loops and are often perceived as a *threat multipliers* that reinforce existing tensions and instability.⁸ Such intensification of existing tensions could be a consequence of the impact of climate

¹ Kamal Eldin Osman Salih, "The Roots and Causes of the 2011 Arab Uprisings," *Arab Studies Quarterly* 35 (2013): 2, 184.

² Salih, "The Roots and Causes," 184.

³ Ibid.

⁴ Ibid, 184-185.

⁵ Ibid, 186-187.; Lisa Anderson, "Demystifying the Arab Spring: Parsing the Differences between Tunisia, Egypt and Libya," *Foreign Affairs* 90 (2011): 3, 4.

⁶ Hans Günter Brauch and Jürgen Scheffran, "Introduction: Climate Change, Human Security and Violent Conflict in the Anthropocene," in *Climate Change, Human Security and Violent Conflict*, ed. Jürgen Scheffran et al., (Berlin Heidelberg: Springer, 2012), 15.

⁷ Brauch and Scheffran, "Introduction," 7.; Jon Barnett, "Environmental Security," in *Contemporary Security Studies*, ed. Alan Collins (Oxford University Press, 2016), 229-246.

⁸ Brauch and Scheffran, "Introduction," 6.; Mohamed Behnassi and Katriona McGlade (eds), *Environmental Change and Human Security in Africa and the Middle East*, (Springer International Publishing, 2017), 5-6.

change on economic activity, food security and livelihood.⁹ Declining available resources can pose indirect socio-political effects on a society, implicating its stability.¹⁰ However, within the field of conflict and security studies, this link between conflict and climate change has been regarded sceptically. Political analysts argue that conflicts over resources do not exist and that a country's structural characteristics are more likely to cause conflict instead.¹¹ The debate between supporters and opponents of the climate-conflict connection is discussed more in depth in the first chapter. From this debate can be concluded that considering the Arab Spring, existing literature has not provided enough country-specific evidence to support the claim of a climate-conflict connection.

Both the lack of evidence and the structural and long-term character of political and economic discontents require a more comprehensive research to why nationwide mass protests broke out in Egypt in January 2011. This research is therefore centred around the connection between climate change and conflict summarised in the following research question: How did climate change impacts on society contribute to the outbreak of the Arab Spring in Egypt in January 2011?

This question will be researched through an analysis of climate change impacts on economic activity, food security and livelihood in Egypt, based on environmental data, reports and news articles. Moreover, for a more comprehensive research into how these impacts contributed to the protests, socio-political factors will be analysed as well. These include governance, social inequalities and regional stability and will be analysed through existing literature on the Arab Spring and news articles covering the mass protests of January 25, 2011.

Method

⁹ Mohamed Behnassi, "Climate Security as a Framework for Climate Policy and Governance," in *Environmental Change and Human Security in Africa and the Middle East*, ed. Mohamed Behnassi and Katriona McGlade (Switzerland: Springer International Publishing, 2017), 6.

¹⁰ Dan Smith and Janani Vivekananda, "A Climate of Conflict: The Links Between Climate Change, Peace and War," *International Alert*, 2007, 7.

¹¹ Michael E. Brown, "The Causes of Internal Conflict: An Overview," in *Nationalism and Ethnic Conflict*, ed. Michael E. Brown et al., (Cambridge, Massachusetts, London, England: 1997), 3-25.

Research on the interaction between climate change, socio-political factors and conflict will be conducted through analysis of both primary and secondary sources. Primary sources consist of news articles dating from January and February 2011, published by Daily News Egypt (DNE) and Egypt Independent (EI) – Egypt’s local English, independent newspapers. This time frame is chosen to allow for a focus on the events around the start of the protests on 25 January 2011.

Daily News Egypt and Egypt Independent enable the non-Arabic world to read about local events from a local perspective. This is useful to get an insider’s perspective on the protests, without it being interfered with by Western media broadcasters. However, English is not the main language of the country, which may cause some difficulties in translating the events into the right phrases. Yet, Egypt had been under British occupation for seventy years, thus English is commonly used throughout the country. Another difficulty is that it is hard to compare the news provided by DNE and EI to other local independent broadcasters. However, DNE and EI are the only independent local English newspapers. Others, such as Al-Alhram Weekly are under government control.¹²

Secondary sources include reports involving climate change impacts on temperature and rainfall in Egypt and subsequent consequences on the Egyptian economy as well as more general publications on the Arab Spring. In addition, literature on the relation between climate change, conflict and governance is used to ground the thesis of this research.

The climate-conflict connection does not operate in a vacuum. Political processes permeate the link in the chain from climate-related change to increased risk of violent conflict.¹³ Therefore, combining both climate change impacts on livelihood of people and

¹² BBC, “Egypt Profile – Media.” last modified October 23, 2018, <https://www.bbc.com/news/world-africa-13313373>, accessed on Jan. 7, 2019.

¹³ Malin Mobjörk et al., “Climate-Related Security Risks: Towards an Integrated Approach,” *Stockholm International Peace Research Institute*, October 2016, 20-21.

socio-political structures allows this research to take a position on how climate change can contribute to political conflict.

In what follows, the theoretical framework on which this research is based will be outlined. Chapter 1 involves an assessment of the historiography of the previously mentioned climate-conflict debate. Chapter 2 provides an analysis of the climate change impacts on the occurrence of natural disasters and resource scarcity, and their consequential impact on economic activity, food security and livelihood in Egypt. Additionally, an analysis of how these impacts implicated political and economic stability and increased risk of conflict is provided. Chapter 3 analyses the socio-political elements of governance, social inequalities and bad neighbours as factors contributing to the outbreak of the mass protests through their effects on political and economic instability.

The analysis reveals that the structural discontents about autocratic rule, corruption, inequality and poverty translated into mass protests through the interaction with climate change impacts on livelihoods in Egypt and the spill over of the Tunisian Revolution. This research provides a specific example of the relevance of understanding the interconnectivity between climate change, political structures and social unrest. The case study proves that climate change impacts are not sufficient or necessary to increase the risk of conflict. However, it does accentuate that disregarding climate change as part of the analysis worsens the risk of violent conflict as climate change reduces the ability of societies to adapt to the impacts of climate change, which in turn increases the risk of conflict.¹⁴ In practice, this means that this research contributes to a more comprehensive understanding of causes of conflict, which can be utilised in conflict prevention and resolution.

¹⁴ Smith and Vivekananda, "A Climate of Conflict," 9.

Theoretical Framework

Research of the climate-conflict linkage of the Arab Spring in Egypt is embedded in the theoretical framework of how climate change could be an underlying cause of conflict, provided by Buhaug, Gleditsch and Theisen (Figure 1).¹⁵

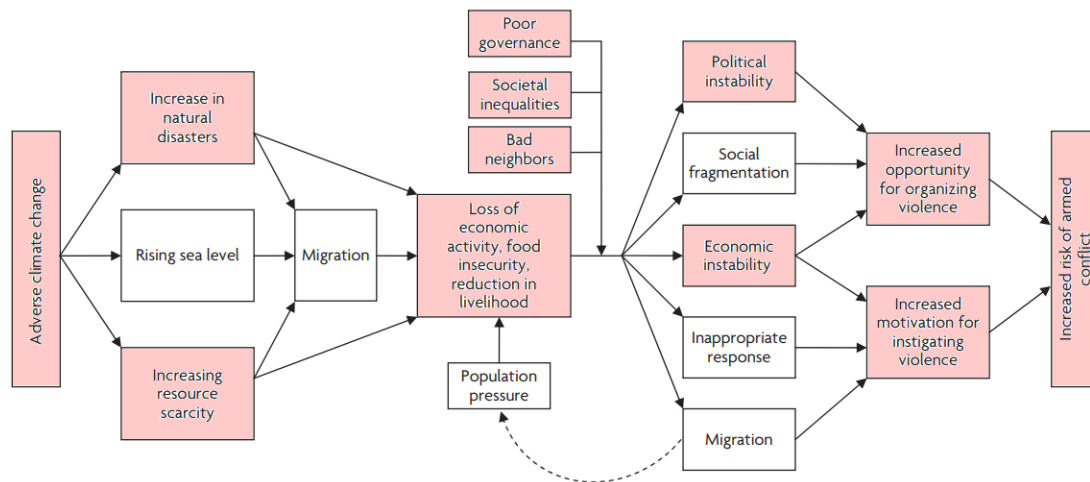


Figure 1: Possible Pathways from Climate Change to Conflict
(Buhaug, Gleditsch and Theisen, 2010, 82)

The framework in figure 1 indicates that there are many possible ways in which the root causes of a conflict could originate from the interaction between climate change impacts and socio-political factors. The pathway of factors that this research focusses on is indicated with colour. Selection is based on the factors that are applicable to the case of Egypt. Sea-level rise for example does pose a potential threat to the Nile Delta but has not yet resulted in large-scale migration of people.¹⁶ Sea-level rise is therefore not

¹⁵ Halvard Buhaug, Nils Petter Gleditsch and Ole Magnus Theisen, "Implications of Climate Change for Armed Conflict," in *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*, ed. Robin Mearns and Andrew Norton (Washington DC, The World Bank: 2010), 82.

¹⁶ Most research of climate change in Egypt focuses on salinization as a result of sea-level rise and on subsequent agricultural losses. The theoretical framework used here does not allow for sea-level rise to be taken into account due to the link with migration as a social consequence. The connection with conflict following from there is the increasing pressure on scarce resources at the destination of migrants. Exclusion of sea-level rise here does not mean that it does not pose a threat to Egypt. On the contrary, sea-level rise poses a major threat to the Nile Delta. The Nile Delta faces a double threat of the rising sea and the sinking delta, the latter as a result of the Aswan High Dam and the upcoming Ethiopian Grand Renaissance Dam blocking the sediments from adding to the land. This research will not go into detail about this because salt intrusion is currently an issue due to manmade constructions and to lesser extent due to sea-level rise. The projected future impact of sea-level rise however poses an important threat. For more on this topic, see: John Bohannon, "The Nile Delta's Sinking Future," *Science* 327 (2010): 1444-1447.

considered in this research, and consequently, migration and population pressure are left out in the second half of the graph. In addition, social fragmentation is excluded because it refers to polarisation in ethnically diverse societies.¹⁷ This is not applicable because the population in Egypt is mostly ethnically homogenous.¹⁸ Inappropriate response refers to human reactions to climate change such as strong emission-reduction policies and (small-scale) dam-building.¹⁹ As this research focusses on the 2011 Arab Spring, the impact of the Grand Ethiopian Renaissance Dam will not be considered, because the construction only started in 2011. Moreover, the Aswan High Dam was constructed for industrialisation purposes, therefore, inappropriate response is excluded as well.

The following path will be utilised: the effects of climate change on the occurrence of natural disasters and resource scarcity and their consequences for economic activity, food security and livelihood. This first step highlights the possibility of increasing scarcity of renewable resources to cause unemployment, loss of livelihood and economic activity, and subsequently decrease state income.²⁰ Important additional socio-political factors that need to be considered in following phase are the conflict-promoting factors of governance, social inequalities and the situation in neighbouring countries.

The last step consists of the interaction between climate change impacts on society and macro-factors causing political and economic instability, thereby increasing the risk of conflict. Political instability is an important stage of development towards conflict because inconsistent political systems are more vulnerable to conflict than stable political systems – everything else being equal.²¹ Economic instability is the second catalyst of social instability because relative deprivation has traditionally been understood as a

¹⁷ Buhaug, Gleditsch and Theisen, “Implications of Climate Change for Armed Conflict,” 84.

¹⁸ Samuel Kinuthia, “Major Ethnic Groups in Egypt.” last modified July 20, 2018, <https://www.worldatlas.com/articles/what-is-the-ethnic-composition-of-egypt.html>, accessed on Jan. 15, 2019.

¹⁹ Buhaug, Gleditsch and Theisen, “Implications of Climate Change for Armed Conflict,” 87.

²⁰ Robin Mearns and Andrew Norton (eds), *The Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*, (Washington DC: The World Bank, 2010), 25.

²¹ Mearns and Norton (eds), *The Social Dimensions of Climate Change*, 83-84.

conflict trigger..²² Reduced state income may also hinder delivery of public services and goods which reduces political legitimacy, and gives rise to political challengers as a result.²³ It is clear from the graph that climate change impacts can reduce a government's ability and legitimacy to govern, maintain economic growth and sustain the livelihoods of its citizens.²⁴ As a result of these human security challenges, social unrest and protests are more likely to take place.²⁵

Political analysts would use a similar framework, except they would focus on the causes of conflict identified only in the second half of this graph, starting at poor governance, social inequalities and bad neighbours.²⁶ This research therefore adds climate change impacts to the existing political analysis of the outbreak of the Arab Spring in Egypt.²⁷

²² Mearns and Norton (eds), *The Social Dimensions of Climate Change*, 85.

²³ Ibid, 25.

²⁴ Behnassi, "Climate Security as a Framework for Climate Policy and Governance," 6.

²⁵ Ibid.

²⁶ Brown, "The Causes of Internal Conflict," 3-25.

²⁷ For an overview of the political analysis of the Arab Spring, see: Salih, "The Roots and Causes," 184-206.

1. Historiography

As the impacts of environmental change on human life on Earth reveal themselves and threaten human security, academics increasingly focus on the environmental dimension of societal issues. The role of climate change in the outbreak of civil conflicts has occupied a part of the academic debate between supporters and opponents of the connection between climate change and conflict. This chapter outlines this debate and elaborates on the position taken by this research.

The debate about climate change and its impact on human security is not an entirely new one. In 2009, the United Nations General Assembly recognised climate change as a threat to international security.²⁸ Consequently, climate change is now an issue that is attended to by the United Nations Security Council.²⁹ The concept of human security is built in part on the recognition of climate change as a threat to security. The broad definition of human security is ‘freedom from fear and want’, encompassing freedom from fear of natural hazards and threats.³⁰ The concept encourages creation of political, social, environmental, economic, military and cultural systems that provide people with the building blocks of survival, livelihood and dignity.³¹ Environmental security is thus a sub-field of human security.³²

The concept of security has historically been considered from a state-based perspective within international politics.³³ For a long time, it mostly entailed military security. The 1990s witnessed a shift towards a widened definition of military, economic, political, social and environmental security.³⁴

²⁸ Eran Feitelson, Abdelrahman Tamini and God Rosenthal, “Climate Change and Security in Israeli-Palestinian Context,” *Journal of Peace Research* 49 (2012): 1, 242.

²⁹ Ragnhild Nordås and Nils Petter Gleditsch, “Climate Change and Conflict,” *Political Geography* 26 (2007): 6, 629.

³⁰ Cornel Zwierlein, “Historicizing Environmental Security,” *European Journal for Security Research* 3 (2018): 1, 1.

³¹ Brauch and Scheffran, “Introduction,” 12.

³² Zwierlein, “Historicizing Environmental Security,” 1.

³³ *Ibid.*, 3.

³⁴ Hans Günter Brauch, “Four Phases of Research on Environment and Security,” *Peace Studies, Public Policy and Global Security* 1 (2010): 145-146.

Leading authors acknowledging the connection between climate change and conflict are Hans Brauch and Jurgen Scheffran and Jon Barnett and Neil Adger.³⁵ Brauch and Scheffran specifically discuss the development towards securitisation of climate change.³⁶ They recognise the shift from ‘national security’ towards ‘human security’ as a change in the objects that are protected.³⁷ Those are individuals whose well-being and survival is at risk at the threat of nature.³⁸ Brauch and Scheffran argue that there may be a connection between climate change and human insecurity, but emphasise that it depends on many specific factors – that result from the interaction between the state, society and the business community – whether environmental stresses result in domestic crises.³⁹

Barnett and Adger argue that climate change may in certain circumstances increase the risk of violent conflict, through direct effects on livelihoods and indirect effects on state functions.⁴⁰ Climate change exacerbate conflict-generating factors, such as vulnerable livelihoods, poverty, weak states and migration.⁴¹ However, Barnett and Adger emphasise that climate change factors do not cause violent conflict in isolation, but merely affect the previously mentioned conflict-generating factors.⁴²

Both Barnett and Adger and Brauch and Scheffran thus argue that implications of climate change are not necessary nor sufficient for conflict to break out.⁴³ This means that risk of conflict can also increase without the condition of climate change, but that does not mean that climate change cannot constitute an important contributing factor.

Homer-Dixon played an important role in shaping the argument that “under certain circumstances, scarcity can produce civil violence and instability by generating intermediate social effects, such as poverty and migrations, that analysts often interpret

³⁵ Jon Barnett and W. Neil Adger, “Climate Change, Human Security and Violent Conflict,” *Political Geography* 26 (2007): 6, 639-655.; Brauch and Scheffran, “Introduction,” 3-40.

³⁶ Brauch and Scheffran, “Introduction,” 7.

³⁷ *Ibid*, 13.

³⁸ *Ibid*, 15.

³⁹ *Ibid*, 20.

⁴⁰ Barnett and Adger, “Climate Change, Human Security and Violent Conflict,” 640.

⁴¹ *Ibid*, 643.

⁴² *Ibid*, 644.

⁴³ *Ibid*, 641-644.; Brauch and Scheffran, “Introduction,” 20-21.

as a conflict's immediate causes".⁴⁴ This research is based on a version of this argument that focusses on the social effects that are often identified as causes of conflict, and have their origins in climate change impacts on society.

Nuances to the climate-conflict connection are brought to the debate by Buhaug, Gleditsch and Theisen.⁴⁵ Although they contributed to the mapping of figure 1 they do not completely support the climate-conflict connection.⁴⁶ Their main critique on the existing literature supporting the connection is that there is a lack of empirical foundation for a general relationship between climate change and conflict.⁴⁷ The issue with the correlation between climate change and conflict is that the quality of data is poor and research designs are limited to indicate a complete convergence between the links only.⁴⁸ However, they emphasise that they are not able to rule out the climate-conflict connection completely.

The main practical argument against that the conclusion of conflict as a consequence of climate change is that many climate processes are gradual, making it possible for people to adapt. This is important because "the inability to adapt plays a central role in the environmental security literature."⁴⁹ Despite their sceptical stance towards the current prove of the connection, Buhaug, Gleditsch and Theisen remain open to improvement in the case study literature for research on the climate-conflict connection.

Existing literature on the connection between the Arab Spring and climate change proves the argument that there is little empirical foundation supporting the claim.⁵⁰ Most research that finds a link between climate change and the Arab Spring generalises the whole region and lacks specific examples.

⁴⁴ Brauch, "Four Phases of Research," 152.

⁴⁵ Buhaug, Gleditsch and Theisen, "Implications of Climate Change for Armed Conflict."

⁴⁶ Figure 1.

⁴⁷ Buhaug, Gleditsch and Theisen, "Implications of Climate Change for Armed Conflict," 75.

⁴⁸ Ibid, 91.

⁴⁹ Ibid, 78, 91.

⁵⁰ Ibid, 75.

First, Johnstone and Mazo only shortly address the possibility of climate change impacts on wheat production to have caused the inevitable Arab Spring to come earlier.⁵¹ They present rising food prices as a result of climate change to have been a necessary component of the protests.⁵² However, their analysis is extremely broad and assumes that all countries in the Middle East and North Africa suffered from the same climate change impacts and the same political discontent. This is a generalisation that cannot be made, because climate change impacts on society differ between different parts of one country, let alone throughout an entire region. Besides, the social and political effects of climate change impacts depend on political policies, which differ for each country. Hence, research of climate change on the Arab Spring overall is not sufficient to draw convincing conclusions about the outbreak of protests in one country specifically.

Second, mathematical modelling implying a correlation between rising food prices and the Arab Spring also generalises the region as a whole.⁵³ Besides, it does not consider that food riots had occurred before and therefore does not explain why the nationwide mass protests in Egypt happened when they did in January 2011. Lastly, research on the link between climate change and the Arab Spring in three regions in North Africa identifies climate change as a threat multiplier of other drivers of unrest⁵⁴ – but concludes with a generalisation of the entire Arab region despite that research had only been conducted on North African countries. The high speculative character and lack of tangible evidence of the complex connection between climate change and conflict is apparent, proving the point of Buhaug, Gleditsch and Theisen.

An opponent of the direct climate-conflict relation is Idean Salehyan. Salehyan argues that environmental issues are *subordinate* to political, social and economic factors

⁵¹ Sarah Johnstone and Jeffrey Mazo, “Global Warming and the Arab Spring,” *Survival* 53 (2011): 2, 16.

⁵² *Ibid*, 15.

⁵³ Marco Lagi, Karla Bertrand, and Yaneer Bar-Yam, “The Food Crises and Political Instability in North Africa and the Middle East,” *New England Complex Systems Institute*, 2011, 6.

⁵⁴ Caitlin E. Werrell and Francesco Femia, conclusion to *The Arab Spring and Climate Change: A Climate and Security Correlations Series*, ed. Caitlin E. Werrell and Francesco Femia (Washington DC: Center for American Progress, 2013), 51.

as a cause of conflict.⁵⁵ Climate change is recognised to pose challenges to economies and social livelihoods, but the climate-conflict relation is “too short-sighted as it ignores human agency, technological innovation and political institution in managing the conflict.”⁵⁶ This perspective is supported by Raleigh and Urdal, who tested the climate-conflict propositions against several case studies. They found that local-level demographic and environmental factors do have some effect on conflict but are outweighed by economic and political factors.⁵⁷

Additionally, political analysts mainly focus on these political, economic and social factors in their analysis of a civil conflict. Michael Brown summarises the main causes of conflict according to academics in the field of conflict studies.⁵⁸ Brown distinguishes underlying factors – which are categorised as permissive factors – consisting of political, structural, socio-economic and cultural factors.⁵⁹ Moreover, catalytic factors on both internal and external level play an important role in the outbreak of conflict. These involve economic discrimination, mass refugee flows and ideological contest about government organisation.⁶⁰

Opponents of the climate-conflict connection thus consider political, economic and social factors to be dominant in the outbreak of conflict. Even if climate change impacts are considered on this side of the debate, they are understood as subordinate and non-explanatory to the conflict.

The perspective this research adopts is one that is inclusive of critiques on both sides of the debate. The political, economic and social perspective is important as it considers macro-factors that majorly dictate the social structures in a country. Moreover,

⁵⁵ Idean Salehyan, “From Climate Change to Conflict? No Consensus Yet,” *Journal of Peace Research* 45 (2008): 3, 315-326.

⁵⁶ Salehyan, “From Climate Change to Conflict?,” 317.

⁵⁷ Clionadh Raleigh and Henrik Urdal, “Climate Change, Demography, Environmental Degradation and Armed Conflict,” *Political Geography* 26 (2007): 6, 674.

⁵⁸ Brown, “The Causes of Internal Conflict,” 3-25.

⁵⁹ Ibid.

⁶⁰ Ibid.

there is agreement in the literature that institutional factors play a key role in preventing social unrest,⁶¹ hence the inclusion of socio-political factors in understanding the link between conflict and climate change.

In addition, this research acknowledges climate change impacts on human security, as these impacts affect the functionality of society and the economy – which in turn accentuates existing political and social structures. In isolation, climate change may not be sufficient to be the main cause of conflict, but it can play an important role that should not be overlooked.

From the theoretical framework outlined above and the position taken in the academic debate it is clear that the focus of this research is on the indirect link between climate change and conflict. Central to the research is therefore the interaction between climate change impacts and socio-political factors to understand how and when climate change impacts increase the risk of conflict. Moreover, this research agrees that evidence is lacking, especially on a country-specific level.⁶² Therefore, this research attempts to contribute a specific example to the debate and literature.

⁶¹ Mobjörk et al., “Climate-Related Security Risks,” 8-9.

⁶² Buhaug, Gleditsch and Theisen, “Implications of Climate Change for Armed Conflict,” 75.

2. Climate Change Impacts on Livelihood in Egypt

Physical impacts of climate change on human security include sea-level rise, rising temperatures and changing precipitation.⁶³ This chapter focuses on the direct impacts of rising temperatures and changing precipitation on the occurrence of natural disasters and resource scarcity and the consequent impacts on economic activity, food security and livelihood of people in Egypt.⁶⁴ Followed by an assessment of the consequences of these impacts on the economic and political stability in the country. This is necessary to understand how climate change impacts may have contributed to the political unrest of the Arab Spring. Research of climate change impacts is conducted through analysis of data and reports on annual temperatures and precipitation. The research scope ranges between the end of the 20th century and the outbreak of the Arab Spring in January 2011. Climate change is a gradual process and therefore climate data on only recent years would not indicate long-term trends.

Global mean temperatures have increased 0.85 degrees Celsius between 1980 and 2012.⁶⁵ However, the rise of temperatures is not distributed equally in all regions of the world.⁶⁶ In Egypt, temperatures have risen 0.07 degrees Celsius in winter and 0.31 degrees Celsius in summer each decade between 1960 and 2010.⁶⁷ That means that in the scope of fifty years, temperatures rose 0.35 degrees Celsius in winter and 1.5 degrees Celsius in summer. Summer temperatures have thus increased significantly more than the global average temperature rise, indicating the unequal distribution of climate change impacts.

⁶³ Barnett, "Environmental Security," 229-246.; Brauch and Scheffran, "Introduction," 7.; As mentioned in the introduction, this research does not include sea-level rise due to its link with migration as a social effect.

⁶⁴ See Figure 1.

⁶⁵ United Nations, "Climate Change." n.d., www.un.org/en/sections/issues-depth/climate-change, accessed on Jan. 6, 2019.

⁶⁶ Barnett, "Environmental Security," 234.; Mobjörk et al., "Climate-Related Security Risks," 23.

⁶⁷ Simon N. Gosling, et al., "Climate: Observations, Projections and Impacts: Egypt," *Met Office*, 2011, 12-13.

Precipitation levels have historically been low in Egypt, as the country is located in an arid region and locked between the African and Asian continent. Most of the rainfall occurs at the Mediterranean coast, annually averaging around 196mm a year.⁶⁸ More inland, towards Cairo and even further to Aswan in the Nile Valley, annual precipitation averages between 25mm and 2mm.⁶⁹ Climatic changes have contributed to an average decline in rainfall of 0.5mm between 1991 and 2015.⁷⁰ This means that rainfall is transitioning from scarce to almost non-existent in some places. The physical impacts of rising temperatures and changing precipitations in Egypt thus mean that the arid country is becoming increasingly hotter and drier over time. This can have severe effects on society's economic and political stability and can increase the risk of conflict in a country.⁷¹

Impacts of Rising Temperatures and Changing Precipitation

Not only are climate change impacts distributed unequally across the world, rising temperatures and changing precipitation levels also implicate livelihoods of some people in society more than others. Water stress has security implications for people living in regions where water is scarce, and where people depend on agriculture for their livelihoods.⁷² It is often the livelihoods of marginalised groups of people that experience threats from a warmer and drier climate.⁷³

Historically, Egypt has been a centre of agriculture, as the annual flooding of the Nile river provided the land with a fertile basis for growth of crops.⁷⁴ However, the

⁶⁸ Gosling et al., "Climate: Observations," 12.; In comparison, average annual precipitation in The Netherlands amounts to 76.6 mm per month. Statista, "Average Monthly Rainfall Netherlands." n.d., <https://www.statista.com/statistics/802733/average-monthly-rainfall-netherlands/>, accessed on Jan. 6, 2018.

⁶⁹ Gosling et al., "Climate: Observations," 12.

⁷⁰ Bahgat M. Abdel-Maksoud, "Estimation of Air Temperature and Rainfall Trends in Egypt," *Asian Journal of Advanced Research and Reports* 1 (2018): 4, 20.

⁷¹ Mobjörk et al., "Climate-Related Security Risks," 17.

⁷² Ibid, 6.

⁷³ Ibid.

⁷⁴ FAO in Egypt, "Egypt at a Glance." *Food and Agriculture Organization*, n.d. <http://www.fao.org/egypt/our-office/egypt-at-a-glance/en/>, accessed on Dec. 27, 2018.

damming of the Nile river, to protect people living on the riverbanks, has altered its flow. As a consequence, agriculture in Egypt is now completely dependent on irrigation practices.⁷⁵

Rising temperatures and decreasing precipitation have negatively affected the amount of freshwater available for agricultural production.⁷⁶ The main source of irrigation water – stored in Lake Nasser behind the Aswan High Dam – is declining due to higher evaporation rates and declining runoff from rainwater.⁷⁷ Moreover, rising temperatures increase the evapotranspiration rate from crops, which increases crop water requirements and decreases crop yields.⁷⁸ The impact of climate change on freshwater thus decreases agricultural output of the farms.

Not only do climate change impacts affect the output of agricultural production, it also negatively affects the economic activity of farmers. Although the share of agriculture to the Gross Domestic Product (GDP) has decreased from almost 20 percent in the 1980s to around 14 percent around 2011,⁷⁹ the share of employment in agriculture still amounts to almost 29 percent.⁸⁰ This has been the same share of employment since the early 2000s.⁸¹ Although the contribution of agriculture to national income declined, it is still an important source of primary income to a quarter of the population.⁸² The impact of climate change on freshwater availability in Egypt thus decreases both domestic agricultural production as well as income generated from agricultural activity. Livelihood

⁷⁵ Julian McGill, Dmitry Prikhodko, Boris Sterk and Peter Talks, “Egypt: Wheat Sector Review,” *Food and Agriculture Organization Investment Centre. Country Highlights (FAO)* 21 (2015).

⁷⁶ David N. Yates and Kenneth M. Strzepek, “An Assessment of Integrated Climate Change Impacts on the Agricultural Economy of Egypt,” *Climatic Change* 38 (1998): 3, 264.

⁷⁷ *Ibid.*, 266.

⁷⁸ *Ibid.*; Mohammed El Said, “Climate Change Threatens Egypt’s Coasts and Agriculture,” last modified March 4, 2018, <http://climatetracker.org/climate-change-threatens-egypts-coasts-agriculture/>, accessed on Jan. 15, 2018.

⁷⁹ Economy Watch, “Egypt Economic Structure,” last modified March 29, 2011, http://www.economywatch.com/world_economy/egypt/structure-of-economy.html, accessed on Dec. 23, 2018.

⁸⁰ Isin Tellioglu and Panos Konandreas, “Agricultural Policies, Trade and Sustainable Development in Egypt,” *International Centre for Trade and Sustainable Development (ICTSD) and United Nations Food and Agriculture Organization (FAO)*, 2017, 2.

⁸¹ Tellioglu and Konandreas, “Agricultural Policies,” 2.

⁸² Hanaa Kheir-El-Din, and Heba El-Laithy, “Agricultural Productivity Growth, Employment and Poverty in Egypt,” (Working Paper 129, Egyptian Center for Economic Studies, 2008), 8-10.

and economic activity prove to be negatively affected by resource scarcity as a consequence of climate change, implicating human security of Egyptians.

Moreover, domestic agricultural production is heavily dictated by the government, which encourages farmers to grow wheat. Through policies that disable the workings of a free economic market, the government tries to ensure that enough wheat is produced.⁸³ This is important because it is the main ingredient for the *baladi* bread that is subsidised by the government. Almost 80 percent of the population is entitled to this subsidised bread, enabling them to buy the bread for a mere 14 percent of the market price.⁸⁴

However, grains produced on the domestic market only satisfy around half the demand.⁸⁵ To meet the full demand, the government of Egypt is a major importer of wheat.⁸⁶ Between 2010-2011, Egypt relied on Russia for 45 percent of its wheat import.⁸⁷ Two other major suppliers of wheat were the United States of America and Australia, providing 23 percent and 9.3 percent respectively.⁸⁸ Egypt's food security is thus vulnerable to climate change impacts on the occurrence of natural disasters and resource scarcity as a quarter of the demand for wheat is met by imports from only one country. Disruption of the agricultural sectors – in Russia in particular – implicates Egypt's basic food supplies.⁸⁹ These impacts are mostly felt by poorer people in society, because these are the people that depend on the government's subsidised bread for their livelihood.

Vulnerability of food security to climatic changes can be illustrated by the high Food Price Index of both 2008 and 2010. Volatile food prices have severe impacts on

⁸³ McGill, Prikhodko, Sterk and Talks, "Egypt: Wheat Sector Review," xii.

⁸⁴ Ibid, 2.

⁸⁵ Tellioglu and Konandreas, "Agricultural Policies," 5.

⁸⁶ Ibid, 2.

⁸⁷ The Observatory of Economic Complexity. n.d., "Where Does Egypt Import Its Wheat From?" <http://atlas.media.mit.edu/278g29>, accessed on Dec. 23, 2018.

⁸⁸ The Observatory of Economic Complexity, "Where Does Egypt Import Its Wheat From?"

⁸⁹ Dan Smith and Janani Vivekananda, "Climate Change, Conflict and Fragility: Getting the Institutions Right," in *Climate Change, Human Security and Violent Conflict*, 77-90, ed. Jürgen Scheffran et al., Berlin Heidelberg: Springer, 2012.

import-dependent countries.⁹⁰ Global wheat production severely declined as a result of crop failures due to extreme droughts in Russia and floods in Australia.⁹¹ Consequently, the increase rate of grain prices exceeded 60 percent in Egypt in 2008.⁹² As more than 40 percent of wheat consumption is imported and 45 percent of the income of Egyptians is spent on food,⁹³ the spike in food commodity prices massively implicated the ability of people to feed themselves. Food prices rose again as a result of extreme weather in 2010.⁹⁴ Government subsidies could not quell the extreme food price rises, implicating food security for many people that were dependent on the subsidised bread. Besides, the availability of subsidised bread also decreased due to the declined supply of wheat on the global market.

Climate change impacts thus affect many socio-economic groups. It alters food entitlement's based on prices and incomes and it reduces the agricultural sector's productivity as well as the economy's ability to import and export agricultural commodities.⁹⁵ Altogether, declining available resources can pose indirect socio-political effects on a society, implicating its stability.⁹⁶ How declining resources implicated stability contributed to the mobilisation for mass protests is analysed in the remainder of this chapter.

Contribution of Climate Change Impacts to Protests

In contrast to academics arguing that resource scarcity does not pose a threat to stability, the rise in global food prices and the consequent effect on the livelihood of people did form a factor of discontent contributing to the protests of January 25, 2011. This is

⁹⁰ Mobjörk et al., "Climate-Related Security Risks," 8.

⁹¹ Ayesha Dinshaw, "Complex Disasters in a Globalized World: A Look at the 2008 Food Crisis." *World Resources Institute*, last modified November 25, 2013, <https://www.wri.org/blog/2013/11/complex-disasters-globalized-world-look-2008-food-crisis>, accessed on Jan. 15, 2019.

⁹² Kenawy and El-Sheikh, "The Rising of Food Prices in Egypt," 627.

⁹³ Ibid, 628.

⁹⁴ Dinshaw, "Complex Disasters in a Globalized World: A Look at the 2008 Food Crisis."

⁹⁵ Yates and Strzepek, "An Assessment of Integrated Climate Change Impacts," 285.

⁹⁶ Smith and Vivekananda, "A Climate of Conflict," 7.

illustrated by a news article from Daily News Egypt published on 30 January 2011: “One of the main reasons protests started are rising food prices and unemployment rates. The populated country of 80 million has an estimated 40 percent of its population living in poverty.”⁹⁷ Rising costs of rice and wheat triggered the food price spikes of 2010 and as a result, local supplies were limited.⁹⁸ Climate change impacts on livelihood and subsequently on the economic stability in the country thus played a role in the outbreak of the Arab Spring protests in January 2011. This accentuates the importance of considering climate change as a factor increasing economic instability and increasing risk of conflict.⁹⁹

Natural disasters and acute resource scarcity revealed the large part of the population living below the poverty line and even added to that amount new groups of people suffering from challenges of livelihood security. This was illustrated in a video by Al Jazeera recording what was once a bustling market but had then been deserted by customers.¹⁰⁰ As a result of inability to buy food, tradesmen also experience a decline in income.¹⁰¹ Consequently, state revenues from tax on consumption and income is also reduces. The combination of lower state budgets, decreasing global production and spiking wheat prices, hindered the ability to deliver goods and services. As a result of declining state services, political legitimacy decreases, which can give rise to political challengers.¹⁰² The Food and Agriculture Organization emphasise the role of economic instability in creating the political instability of the mass protests: “[...] among the grievances which led to unrest in 2011 were shortages in the availability of *baladi* bread and long queues at bakeries.”¹⁰³ Food and livelihood insecurity thus affected political

⁹⁷ Sarah Daoud, “Food Supplies a Concern Amid Growing Unrest in Egypt.” *Daily News Egypt*, last modified January 30, 2011, <https://dailynewsegypt.com/2011/01/30/food-supplies-a-concern-amid-growing-unrest-in-egypt/>, accessed on Dec. 27, 2018.

⁹⁸ Daoud, “Food Supplies a Concern Amid Growing Unrest in Egypt.” *Daily News Egypt*.

⁹⁹ Mobjörk et al., “Climate-Related Security Risks,” 17.

¹⁰⁰ Al Jazeera, “Video: Egyptians Struggle for Bread.” last modified October 16, 2009, <https://www.aljazeera.com/news/middleeast/2009/10/200910168027248397.html>, accessed on Jan. 15, 2019.

¹⁰¹ Al Jazeera, “Video: Egyptians Struggle for Bread.”

¹⁰² Mearns and Norton, *The Social Dimensions of Climate Change*, 25.

¹⁰³ McGill, Prikhodko, Sterk and Talks, “Egypt: Wheat Sector Review,” xii.

stability, as it revealed the inability of the government to provide its citizens with enough human security.

The claim that climate change impacts are *subordinate* to social, political and economic factors¹⁰⁴ proves inaccurate in the case of Egypt. Climate change impacts on food security and livelihood contributed significantly to the economic grievances that motivated people to take action. Economic grief is a factor that is often considered an immediate cause of conflict.¹⁰⁵ Economic instability as addressed here indeed proves it to be a driver of conflict, but this chapter highlights that climate change impacts exacerbated the existing economic marginalisation within society.

Conclusion

Direct impact of natural disasters and resource scarcity on livelihood and indirect impacts on economic and political stability contributed to the mobilisation for nationwide mass protests. These social effects are often seen as immediate causes of conflict, but this chapter shows that these causes can have their roots in environmental processes. Mainly environmental impact on food security and economic activity, combined in challenges of livelihood security, formed an important reason for people to protest against the government. These impacts also highlighted the inability of the government to provide basic human security, increasing the incentive for people to participate in the protests.

Critics of this link between climate change impacts and heightened risk of conflict could argue that it was not the majority of the people that was affected by the climate change impacts on food security. However, as 80 percent of the Egyptian population is eligible for bread subsidies, it is the majority of the people that are affected by freshwater and wheat scarcities and their impact on food security. Especially people working in agriculture and depending on it for their livelihood depend directly on a climate-sensitive

¹⁰⁴ Salehyan, "From Climate Change to Conflict?," 315-326.

¹⁰⁵ Brauch, "Four Phases of Research," 152.

sector.¹⁰⁶ Moreover, as Egypt is dependent on wheat imports for half of its demand, the entire population country could be considered vulnerable to climate change impacts on agriculture challenging their livelihood security.

Another critical note on the link between the food crisis and protests includes that the food crisis was not solely the result of climate change impacts but was also a consequence of increasing demand for biofuels.¹⁰⁷ However, natural disasters as a result of changing temperatures and precipitation did play a role specifically on food security in Egypt. Egypt imports almost half of its wheat for consumption from Russia and Australia, whose agricultural productions suffered from droughts and floods. Besides, domestic agricultural production also proved vulnerable to rising temperatures and decreasing precipitation, with a decline in rainfall to almost non-existent in some critical regions. This implicates economic activity and livelihoods of at least a quarter of the population, whose primary income is derived from agriculture.

The impacts outlined above do indicate that challenges to livelihood were among the discontents of protesters. However, they do not explain *why* the Arab Spring protests broke out in January 2011, as major food riots had occurred before and food price spikes had also taken place in 2008 already. Those did not lead to mass protest and regime change then.¹⁰⁸ Socio-political structures are critical to understanding the true relation between climate change impacts and conflict: “The social and political effects of droughts depend on political and social policies.”¹⁰⁹ Chapter 3 will therefore elaborate on governance, political and social structures that shape the next section of the framework.

¹⁰⁶ Mearns and Norton, *The Social Dimensions of Climate Change*, 14.

¹⁰⁷ Al Jazeera, “Behind the Latest Food Crisis.” last modified on October 13, 2010, <https://www.aljazeera.com/programmes/insidestory/2010/10/2010101313139833483.html>, accessed on Jan. 6, 2018.

¹⁰⁸ Louise Sarant, “Tunisia, Algeria Protests Unlikely in Egypt.” *Egypt Independent*, last modified January 12, 2011, <https://www.egyptindependent.com/tunisia-algeria-riots-unlikely-egypt-experts-say/>, accessed on Jan. 7, 2019.

¹⁰⁹ Ole Magnus Theisen, Helge Holtermann and Halvard Buhaug, “Climate Wars? Assessing the Claim That Drought Breeds Conflict,” *International Security* 36 (2012): 3, 88.

3. Governance, Social Inequalities and Bad Neighbours

The previous chapter shows that climate change impacts on economic activity, food security and livelihood implicated people's ability to provide for themselves, contributing to economic and political instability. However, these impacts alone do not fully comprehend *why* such factors do increase the risk of conflict in in some countries, but in others they do not. It is often argued that the social and political effects of climate change impacts depend on political structures and government policies.¹¹⁰ This connection with socio-political factors is also indicated in figure 1 that illustrates the theoretical framework. Based on news articles dating from January and February 2011 and additional literature, this chapter provides an analysis of the role played by governance, social inequalities and bad neighbours in the outbreak of the Arab Spring in Egypt in 2011.

The factors governance, bad neighbours and social inequalities are factors that are also identified by political analysts in their analysis of conflict situations.¹¹¹ However, political analysts only start at this point in the framework to understand conflict dynamics. The purpose of this research is to emphasise the interaction between environmental and political systems for a more comprehensive understanding of organised violence. Therefore, this research includes this chapter on conflict generating socio-political factors in addition to environmental impacts.

Poor Governance

Poor governance plays an important role in the transition from peace to political conflict.¹¹² It is commonly argued that the Arab Spring revolts erupted as a reaction against repressive authoritarian regimes.¹¹³ Before the Arab Spring, Egypt had been under authoritarian rule by president Mubarak for 30 years. His presidency was characterised

¹¹⁰ Theisen, Holtermann and Buhaug, "Climate Wars?," 88.

¹¹¹ Brown, "The Causes of Internal Conflict," 3-25.

¹¹² Ibid.

¹¹³ Salih, "The Roots and Causes," 188-189.

by an everlasting ‘state of emergency’ that allowed for the government forces to undermine the rights and freedoms that are included in the Egyptian Constitution.¹¹⁴

News articles about the protests show that the autocratic rule of the country majorly contributed to the structural discontent of people. “Egypt suffers from an autocratic regime that limits freedoms, vast corruption in top government positions and widespread poverty.”¹¹⁵ Despite the strong and successful economic policy of Gamal Mubarak,¹¹⁶ “strong growth [...] largely failed to improve the lot of the poor majority of Egyptians, benefiting mostly the small clique of businessmen surrounding him [Gamal Mubarak]”.¹¹⁷ The impacts of high food prices and declining agricultural revenues on livelihoods of people, identified in chapter 2, thus accentuated the already structural widespread unemployment amongst citizens.¹¹⁸ The worsening economic conditions were not only a consequence of climate change, but also partly resulting from poor government policies.¹¹⁹ Mobilisation of people for mass protests was thus possible through a combination of structural and more acute economic instability. The economic conditions may not have been the same for everyone participating in the protests, but people from many different backgrounds channelled their discontents into a common goal: regime change.¹²⁰

The responsibility of the government to provide for livelihood opportunities was highlighted by UN Secretary General Ban Ki-Moon, who specifically commented on the Egyptian crisis that “leaders have the responsibility to provide decent jobs and

¹¹⁴ International Federation for Human Rights, “The Emergency Law in Egypt.” last modified November 17, 2001, <https://www.fidh.org/en/region/north-africa-middle-east/egypt/THE-EMERGENCY-LAW-IN-EGYPT>, accessed on Jan. 9, 2019.

¹¹⁵ Tamin Elyan and Abdel-Rahman Hussein, “Egypt Susceptible to Tunisia-style Revolt.” *Daily News Egypt*, last modified January 18, 2011, <https://dailynewsegyp.com/2011/01/18/egypt-susceptible-to-tunisia-style-revolt/>, accessed on Dec. 27, 2018.

¹¹⁶ President Hosni Mubarak’s son.

¹¹⁷ AP, “Egyptian Economy Key to Mubarak Son Presidency Bid.” *Egypt Independent*, last modified, January 19, 2011, <https://www.egyptindependent.com/egyptian-economy-key-mubarak-son-presidency-bid/>, accessed on Jan. 7, 2019.

¹¹⁸ Anderson, “Demystifying the Arab Spring,” 4.

¹¹⁹ Elyan and Hussein, “Egypt Susceptible to Tunisia-style Revolt.” *Daily News Egypt*.

¹²⁰ AFP, “Unrest in Egypt: A Timeline.” *Daily News Egypt*, last modified January 31, 2011, <https://dailynewsegyp.com/2011/01/31/unrest-in-egypt-a-timeline/>, accessed on Dec. 27, 2018.

opportunities.”¹²¹ This comment also indicates that structural discontent about the government’s failure to provide its citizens with adequate economic opportunities served as a solid base for the outbreak of the protests.

Another structural factor contributing to the outbreak of the protests was police brutality. The misuse of power by the Egyptian security forces was illustrated by the security forces beating Khaled Said to death in June 2010.¹²² In retaliation for his death, the owners of the “We Are All Khaled Said”-Facebook page called for protests on the 25th of January – the National Police Day.¹²³ The killing of Khaled Said by the police transformed him into the embodiment of people’s discontent with the everlasting ‘state of emergency’.¹²⁴ Like Bouazizi became the symbol of discontent in Tunisia, Said became a symbol of injustice in Egypt. This symbolisation is perfectly highlighted in an illustration in a blogpost posted on the *Egyptian Chronicles, 7000 Years and Counting...* on 27 January 2011 – Said’s birthday and the third consecutive day of mass protests.¹²⁵ Illustrated is a birthday cake – with Said’s face and #Jan25 on it – that is crashing down on Hosni Mubarak. The subscription to it reads: “Happy birthday Khaled Said – you are the Mohamed Abou Azizi of Egypt.”¹²⁶ This shows that Khaled Said had become the symbol for the protests. The cake crashing down on Mubarak in combination with the subscription also signposts the goal of the protests: to topple the regime like the Tunisians did.

¹²¹ Daoud, “Food Supplies a Concern Amid Growing Unrest in Egypt,” *Daily News Egypt*.

¹²² Thomas Olesen, ““We are all Khaled Said”: Visual Injustice Symbols in the Egyptian Revolution, 2010–2011,” in *Advances in the Visual Analysis of Social Movements (Research in Social Movements, Conflicts and Change)*: 35, 3-25 ed. Nicole Doerr, Alice Mattoni, Simon Teune, Emerald Group Publishing Limited, 2013.

¹²³ Tamim Elyan, “Thousands protest across Egypt in ‘Day of Anger.’” *Daily News Egypt*, last modified January 25, 2011, <https://dailynewsegypt.com/2011/01/25/thousands-protest-across-egypt-in-day-of-anger/>, accessed on Dec. 27, 2018.

¹²⁴ Olesen, ““We are all Khaled Said,”” 3-25.

¹²⁵ Zeinobia, “Happy Birthday Khaled Said,” *The Egypt Chronicles, 7000 Years and Counting...* (blog), January 27, 2011 (02:00 p.m.), <https://egyptianchronicles.blogspot.com/2011/01/>.

¹²⁶ Zeinobia, “Happy Birthday Khaled Said,” (blog).

Social Inequalities

The socio-political factors of autocratic governance and structural widespread poverty formed thus a solid base for the outbreak of the protests. The Mubarak administration was not only characterised by autocracy, but also by corruption and unequal economic opportunities. Corruption decreased the economic opportunities and reduced the government jobs substantially.¹²⁷ Besides, tax on consumption increased, while foreign investors were granted exemption from taxes.¹²⁸ Ongoing enrichment of the elites was in stark contrast to the widespread poverty among the population.

Social inequality was not only an issue between elites and the population, but also between employers and employees. Contributing to the nationwide protest were sector protests and strikes.¹²⁹ Workers from different sectors were on a strike, joining the main protests, because they had not had a pay raise for twenty years.¹³⁰ Others complained about getting paid only one-fifth of the sector head's salary.¹³¹ Besides, others protested about the wage gap between employees appointed from the military and non-military employees – the first earning 330 times more than the latter.¹³² Demands included appointment of staff on temporary contracts, changing the administration of organisations, enhancing the wage system and ending corruption.¹³³ People from a broad range of sectors came out to protest, reflecting the “dire conditions that Egyptian workers go through and their feeling of frustration since these problems directly affect their families' livelihoods.”¹³⁴

This illustrates that authoritarian rule over economic activity, opportunities, livelihoods and social inequalities formed an important factor contributing to the

¹²⁷ Salih, “The Roots and Causes,” 187.

¹²⁸ Ibid.

¹²⁹ Elyan, Tamim, “Sector Protests, Strikes Sweep Egypt.” *Daily News Egypt*, last modified February 9, 2011, <https://dailynewsegypt.com/2011/02/09/labor-protests-strikes-sweep-egypt/>, accessed on Dec. 27, 2018.

¹³⁰ Tamim, “Sector Protests, Strikes Sweep Egypt.” *Daily News Egypt*.

¹³¹ Ibid.

¹³² Ibid.

¹³³ Ibid.

¹³⁴ Ibid.

motivation to protest. However, these structural discontents had been present throughout the 30-year-rule of president Hosni Mubarak but had not produced nationwide mass protests like the Arab Spring before.

Bad Neighbours

According to political analysts, an important trigger of conflict is bad neighbours.¹³⁵ This means that an internal conflict can spill over national borders, creating regional instability.¹³⁶ For example, the spill over from the Rwandan genocide caused major unrest in neighbouring countries such as Democratic Republic of Congo. A conflict can thus spill over negative effects,¹³⁷ but positive outcomes can spill over to neighbouring countries too.

On 18 January 2011 – a week before the outbreak of the protests – The Daily News Egypt reported that Egypt was susceptible to revolts like the ones in Tunisia.¹³⁸ The similar political circumstances of an autocratic regime that limited freedom, and was characterised by corruption in the government positions and widespread poverty made it likely for Egyptians to revolt like Tunisians did.¹³⁹ Not only the autocratic regime and poverty, but also lack of equality could potentially lead to political protests, according to the Daily News Egypt.¹⁴⁰ However, opponents of this view, published in the Egypt Independent, argued that Egypt would not experience similar uprisings as a result of the relatively small educated middle class – which formed the main proportion of protesters in Tunisia.¹⁴¹

¹³⁵ Brown, “The Causes of Internal Conflict,” 3-25.

¹³⁶ Charles T. Call, and Elizabeth M. Cousens, “Ending Wars and Building Peace. International Responses to War-Torn Societies,” *International Studies Perspectives* 9 (2008): 17.

¹³⁷ In practice, these effects can be refugees fleeing to neighbouring countries, or the fact that the criminal government goes into exile in another country in the region. This may spark conflict between the population of the one country and the government of the country where the exiled government is located.

¹³⁸ Elyan and Hussein, “Egypt Susceptible to Tunisia-style Revolt,” *Daily News Egypt*.

¹³⁹ Ibid.

¹⁴⁰ Ibid.

¹⁴¹ Sarant, “Tunisia, Algeria Protests Unlikely in Egypt,” *Egypt Independent*.

However, as indicated before, an important factor contributing to the outbreak of the protests was police brutality. The misuse of power by the Egyptian security forces was a similar factor of discontent as the reason for Bouazizi to set himself alight in Tunisia, which sparked the revolution.¹⁴² The news article quotes leaders of opposition parties that are positive that the events in Tunisia form an inspiration to Egyptian people because “aspirations for change have existed for long in Egypt and the situation is even worse than in Tunisia.”¹⁴³ A government-spokesmen however downplays the similarities and highlights that the situation is very different in every country. A local political analyst does recognise the similarities between the countries but is hesitant to conclude that a similar revolt will also have a similar outcome in Egypt.¹⁴⁴

In hindsight, the spill over effect from Tunisia to Egypt is evident from the copycat of Bouazizi’s protest. From an article covering a timeline from 17 January until 31 January 2011, it is clear that Bouazizi inspired Egyptians: a week before the Day of Anger, three men set themselves alight within 48 hours.¹⁴⁵ One 50-year-old man in front of the parliament on the 17th of January 2011, one 25-year-old unemployed man in Alexandria and the third, a lawyer who set himself on fire outside the government headquarters in Cairo.¹⁴⁶ These individual protests indicate a spill over of the hope of a similar revolution as a result of their copied styles of protest in Egypt.

The combination of the initiation to protest on the National Police Day, together with the illustration of Khaled Said and the Bouazizi-style self-immolation of three Egyptians and the similarities of the discontents of Egyptians, indicate that the ‘bad neighbour’ factor played by the Tunisian Revolution was crucial to the outbreak of the

¹⁴² Olesen, ““We are all Khaled Said,”” 3-25.

¹⁴³ Elyan and Hussein, “Egypt Susceptible to Tunisia-style Revolt,” *Daily News Egypt*.

¹⁴⁴ Ibid.

¹⁴⁵ AFP, “Unrest in Egypt: A Timeline,” *Daily News Egypt*.

¹⁴⁶ Ibid.

protests in Egypt. It acted as the fuel that transformed a smouldering fire of structural economic and political instability into mass collective action against the government.

Conclusion

Concluding, the socio-political factors that formed the basis for the outbreak of the protests in Egypt included the structural autocratic governance and social inequalities. Increasingly declining economic opportunities and economic conditions – despite a growing economy – one of the main reasons for protests in Egypt. Especially the unequal distribution of economic revenues of the state high unemployment rates indicate a structural discontent of the population with the government. Poor governance was also accentuated by the death of Khaled Said, which became an important symbol to the protests. Besides, social inequalities as a result of the selective economic policies, favoured towards domestic elites and foreign investors increased the gap between the population – of which 40 percent lived in poverty – and the elites.

The interaction between structural economic marginalisation and structural political discontent of the autocratic government was fuelled by the hope of reform spilling over from the successful Tunisian Revolution against a similar state, ultimately sparking the outbreak of the mass protests in Egypt.

Conclusion

The question how climate change impacts have contributed to the outbreak of the Arab Spring in Egypt in 2011 is complex. The impacts of rising temperatures and changing precipitation on the occurrence of natural disasters and resource scarcity show that Egypt's economic stability is not only vulnerable to climate change within its own national borders, but also outside of that. In the years leading up to the outbreak of the Arab Spring in Egypt, people's economic stability was threatened through rising prices of basic food products due to natural disasters and resource scarcity. Food security proved an important contributor to the mobilisation as it emphasised the structural economic deprivations of the majority of the population.

Moreover, climate change implicated the government's ability to provide the elements of human security necessary for peace. Because natural disasters in major wheat-exporting countries drove up the prices, the government was unable to provide the population with enough and affordable bread. Besides, climate change impacts on domestic agriculture threatens the economic activity of a quarter of the population employed in the agricultural sector. This also translates into less resources for the government to address climate change adaptation, adding to the downwards spiral of government inability.

The government's legitimacy to govern had been questionable throughout the 30-year autocratic rule of president Mubarak. Corruption in government positions, widespread poverty among the people, police brutality in an everlasting 'state of emergency' and social inequality between elites and the majority of the population had all been among the structural discontents of people.

Increasing economic and political instability as a consequence of the interaction between climate change impacts on society and the economy, and existing structural discontent with the autocratic rule provided a solid ground for mobilisation of people for

mass protests. The climate change impacts serving as a more direct impact on people, and poor governance as a more structural impact.

This research shows that the structural discontent with the government was accentuated through the climate change impacts on the economic stability of people. These factors translated into nationwide mass protests through the catalyst in the mix: the success of the Tunisian Revolution spilling over hope and inspiration for a similar revolution. Together, the structural political discontent, direct economic instability as a result of climate change and the trigger of the Tunisian revolution explain why the Arab Spring protests in Egypt took place in January 2011.

Contribution of climate change impacts to the outbreak of the protests was thus the exacerbation of challenges to livelihood security, government illegitimacy and structural discontents. The widespread poverty for which the government had had no attention was exacerbated by natural disasters and resource scarcity, implicating people's livelihoods even further. That shed a light on the corrupt and autocratic rule of the government that was unable to provide its citizens the human security they needed. Climate change impacts thus formed the spotlight on the malfunctioning of the government and the economic instability of the population. Poor governance and social inequality formed the solid base for protests that was topped up by climate change impacts on livelihoods. The Tunisian Revolution ultimately sparked the hope for revolution, which provided the people with motivation to mobilise for nationwide mass protests.

This research thus shows that a comprehensive understanding of the Arab Spring in Egypt requires an economic, political, social and environmental approach. Moreover, this research proves that climate change impacts are not sufficient nor necessary for conflict to erupt, but they are an important contributor that should not be overlooked. It is always difficult to pose a "what if" question, so I cannot say what would have happened if it were not for the environmental scarcities adding to the list of discontents – but it is

sure that it did play an important role in Egypt. Considering climate change impacts is thus necessary for conflict prevention and resolution.

The framework utilised in this research does however not include feedback loops. It is important to note that the factors may aggravate other factors, pointing to a mutually reinforcing relationship between climate change impacts, insecurity and conflict. This way, factors exacerbate others through multiple loops, increasing the impacts of some crucial factors.

Besides, this research attempts to show a part of the interaction between climate change impacts and socio-political factors but has not considered the complete set of factors that increase the risk of conflict. Only climate change impacts of rising temperatures and changing precipitation on natural disasters and resource scarcity have been discussed as a result of the simplification of migration as the only social effect of sea-level rise. However, sea-level rise poses a significant risk to society in Egypt as this consequence of global warming is exacerbated by the sinking of the Nile Delta due to the construction of dams, reducing the amount of sediments settling in the delta. As a consequence, salt-intrusion poses a major threat to agriculture and livelihoods. Possible future research on the contribution of climate change to the Arab Spring in Egypt should consider sea-level rise for an even more comprehensive understanding.

Through adding this country specific example of climate change contributing to the outbreak of the Arab Spring, I would like to emphasise once more that this research is not extrapolatable to the entire Arab Spring. Governance serves as a crucial mechanism for adaptation or reaction to climate change impacts. Therefore, research of a specific climate variable and a negative security outcome can produce disparate findings. Cautious attention therefore needs to be paid to the application of findings about one country to an entire region. It can be used as an example and motivation for further research, but it cannot serve as a blueprint for the entire Arab world.

Bibliography

- Abdel-Maksoud, Bahgan M. "Estimation of Air Temperature and Rainfall Trends in Egypt." *Asian Journal of Advanced Research and Reports* 1 (2018): 4, 1-22.
- AFP. "Unrest in Egypt: A Timeline." *Daily News Egypt*. Last modified January 31, 2011, <https://dailynewsegypt.com/2011/01/31/unrest-in-egypt-a-timeline/>, accessed on Dec. 27, 2018.
- Al Jazeera. "Behind the Latest Food Crisis." Last modified October 13, 2010, <https://www.aljazeera.com/programmes/insidestory/2010/10/2010101313139833483.html>, accessed on Jan. 6, 2018.
- Al Jazeera. "Video: Egyptians Struggle for Bread." Last modified October 16, 2009, <https://www.aljazeera.com/news/middleeast/2009/10/200910168027248397.html>, accessed on Jan. 15, 2019.
- Anderson, Lisa. "Demystifying the Arab Spring: Parsing the Differences between Tunisia, Egypt and Libya." *Foreign Affairs* 90 (2011): 3, 2-27.
- AP. "Egyptian Economy Key to Mubarak Son Presidency Bid." *Egypt Independent*. Last modified January 19, 2011, <https://www.egyptindependent.com/egyptian-economy-key-mubarak-son-presidency-bid/>, accessed on Jan. 7, 2019.
- Barnett, Jon. "Environmental Security." In *Contemporary Security Studies*, 229-246. Edited by Alan Collins. Oxford University Press, 2016.
- Barnett, Jon, and W. Neil Adger. "Climate Change, Human Security and Violent Conflict." *Political Geography* 26 (2007): 6, 639-655.
- BBC. "Egypt Profile – Media." Last modified October 23, 2018, <https://www.bbc.com/news/world-africa-13313373>, accessed Jan. 7, 2019.
- Behnassi, Mohamed. "Climate Security as a Framework for Climate Policy and Governance." In *Environmental Change and Human Security in Africa and the Middle East*, 3-24. Edited by Mohamed Behnassi and Katriona McGlade. Switzerland: Springer International Publishing, 2017.
- Behnassi, Mohamed, and Katriona McGlade (eds). *Environmental Change and Human Security in Africa and the Middle East*. Springer International Publishing, 2017.
- Bohannon, John. "The Nile Delta's Sinking Future." *Science* 327 (2010): 1444-1447.
- Brauch, Hans Günter. "Four Phases of Research on Environment and Security." *Peace Studies, Public Policy and Global Security* 1 (2010): 141-185.
- Brauch, Hans Günter and Jürgen Scheffran. "Introduction: Climate Change, Human Security and Violent Conflict in the Anthropocene." In *Climate Change, Human Security and Violent Conflict*, 3-40. Edited by Jürgen Scheffran, Michael Brzoska, Hans Günter Brauch, Peter Michael Link and Janpeter Schilling. Berlin Heidelberg: Springer, 2012.
- Brown, Michael E. "The Causes of Internal Conflict: An Overview." In *Nationalism and Ethnic Conflict*, 3-25. Edited by Michael E. Brown, Owen R. Coté Jr., Sean M. Lynn-Jones and Steven E. Miller. Cambridge, Massachusetts, London, England: 1997.
- Buhaug, Halvard, Nils Petter Gleditsch, and Ole Magnus Theisen. "Implications of Climate Change for Armed Conflict." In *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*, 75-101. Edited by Robin Mearns and Andrew Norton. Washington DC: The World Bank: 2010.

- Call, Charles T., and Elizabeth M. Cousens. "Ending Wars and Building Peace. International Responses to War-Torn Societies." *International Studies Perspectives* 9 (2008): 14-21.
- Daoud, Sarah. "Food Supplies a Concern Amid Growing Unrest in Egypt." *Daily News Egypt*. Last modified January 30, 2011, <https://dailynewsegypt.com/2011/01/30/food-supplies-a-concern-amid-growing-unrest-in-egypt/>, accessed on Dec. 27, 2018.
- Dinshaw, Ayesha. "Complex Disasters in a Globalized World: A Look at the 2008 Food Crisis." *World Resources Institute*. Last modified November 25, 2013, <https://www.wri.org/blog/2013/11/complex-disasters-globalized-world-look-2008-food-crisis>, accessed on Jan. 15, 2019.
- Economy Watch. "Egypt Economic Structure." Last modified March 29, 2011, http://www.economywatch.com/world_economy/egypt/structure-of-economy.html, accessed Dec. 23, 2018.
- El Said, Mohammed. "Climate Change Threatens Egypt's Coasts and Agriculture." Last modified, March 4, 2018, <http://climatetracker.org/climate-change-threatens-egypts-coasts-agriculture/>, accessed on Jan. 15, 2018.
- Elyan, Tamim. "Thousands Protest Across Egypt in 'Day of Anger.'" *Daily News Egypt*. Last modified January 25, 2011, <https://dailynewsegypt.com/2011/01/25/thousands-protest-across-egypt-in-day-of-anger/>, accessed on Dec. 27, 2018.
- Elyan, Tamim. "Sector Protests, Strikes Sweep Egypt." *Daily News Egypt*. Last modified February 9, 2011, <https://dailynewsegypt.com/2011/02/09/labor-protests-strikes-sweep-egypt/>, accessed on Dec. 27, 2018.
- Elyan, Tamim, and Abdel-Rahman Hussein. "Egypt Susceptible to Tunisia-style Revolt." *Daily News Egypt*. Last modified January 18, 2011, <https://dailynewsegypt.com/2011/01/18/egypt-susceptible-to-tunisia-style-revolt/>, accessed on Dec. 27, 2018.
- FAO in Egypt. "Egypt at a Glance." *Food and Agriculture Organization*. N.d. <http://www.fao.org/egypt/our-office/egypt-at-a-glance/en/>, accessed on Dec. 27, 2018.
- Feitelson, Eran, Abdelrahman Tamini and God Rosenthal. "Climate Change and Security in Israeli-Palestinian Context." *Journal of Peace Research* 49 (2012): 1, 241-257.
- Gosling, Simon N., Robert Dunn, Fiona Carrol, Nikos Christidis, John Fullwood, Diogo de Gusmao, Nicola Golding, Lizzie Good, Trish Hall, Lizzie Kendon et al. "Climate: Observations, Projections and Impacts: Egypt." *Met Office*, 2011.
- International Federation for Human Rights. "The Emergency Law in Egypt." Last modified November 17, 2001, <https://www.fidh.org/en/region/north-africa-middle-east/egypt/THE-EMERGENCY-LAW-IN-EGYPT>, accessed on Jan. 9, 2019.
- Johnstone, Sarah, and Jeffrey Mazo. "Global Warming and the Arab Spring." *Survival* 53 (2011): 2, 11-17.
- Kenawy, Ezzat Molouk, and Kafr El-Sheikh. "The Rising of Food Prices in Egypt: Reasons and Solutions." *Middle-East Journal of Scientific Research* 10 (2011): 5, 626-630.
- Kheir-El-Din, Hanaa, and Heba El-Laithy. "Agricultural Productivity Growth, Employment and Poverty in Egypt." (Working Paper 129, Egyptian Center for Economic Studies, 2008).
- Kinuthia, Samuel. "Major Ethnic Groups in Egypt." Last modified July 20, 2018, <https://www.worldatlas.com/articles/what-is-the-ethnic-composition-of-egypt.html>, accessed on Jan. 15, 2019.
- Lagi, Marco, Karla Bertrand, and Yaneer Bar-Yam. "The Food Crises and Political Instability in North Africa and The Middle East." *New England Complex Systems Institute*, 2011.
- McGill, Julian, Dmitry Prikhodko, Boris Sterk and Peter Talks. "Egypt: Wheat Sector Review." *Food and Agriculture Organization Investment Centre. Country Highlights (FAO)* 21 (2015).

- Mearns, Robin, and Andrew Norton (eds). *The Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*. Washington DC: The World Bank, 2010.
- Mobjörk, Malin, Maria-Therese Gustafsson, Hannes Sonnsjö, Sebastian van Baalen, Lisa Maria Dellmuth, and Niklas Bremberg. "Climate-Related Security Risks: Towards an Integrated Approach." *Stockholm International Peace Research Institute*, October 2016.
- Nordås, Ragnhild, and Nils Petter Gleditsch. "Climate Change and Conflict." *Political Geography* 26 (2007): 6, 627-638.
- Olesen, Thomas. "'We are all Khaled Said': Visual Injustice Symbols in the Egyptian Revolution, 2010–2011." In *Advances in the Visual Analysis of Social Movements (Research in Social Movements, Conflicts and Change)*: 35, 3-25. Edited by Nicole Doerr, Alice Mattoni, Simon Teune. Emerald Group Publishing Limited, 2013.
- Raleigh, Clionadh, and Henrik Urdal. "Climate Change, Demography, Environmental Degradation and Armed Conflict." *Political Geography* 26 (2007): 6, 674-694.
- Salehyan, Idean. "From Climate Change to Conflict? No Consensus Yet." *Journal of Peace Research* 45 (2008): 3, 315-326.
- Salih, Kamal Eldin Osman. "The Roots and Causes of the 2011 Arab Uprisings." *Arab Studies Quarterly* 35 (2013): 2, 184-206.
- Sarant, Louise. "Tunisia, Algeria Protests Unlikely in Egypt." *Egypt Independent*. Last modified January 12, 2011, <https://www.egyptindependent.com/tunisia-algeria-riots-unlikely-egypt-experts-say/>, accessed on Jan. 7, 2019.
- Smith, Dan, and Janani Vivekananda. "A Climate of Conflict: The Links Between Climate Change, Peace and War." *International Alert*, 2007.
- Smith, Dan, and Janani Vivekananda. "Climate Change, Conflict and Fragility: Getting the Institutions Right." In *Climate Change, Human Security and Violent Conflict*, 77-90. Edited by Jürgen Scheffran, Michael Brzoska, Hans Günter Brauch, Peter Michael Link and Janpeter Schilling. Berlin Heidelberg: Springer, 2012.
- Statista. "Average Monthly Rainfall Netherlands." N.d. <https://www.statista.com/statistics/802733/average-monthly-rainfall-netherlands/>, accessed Jan. 6, 2018.
- Tellioglu, Isin, and Panos Konandreas. "Agricultural Policies, Trade and Sustainable Development in Egypt." *International Centre for Trade and Sustainable Development (ICTSD) and United Nations Food and Agriculture Organization (FAO)*, 2017.
- The Observatory of Economic Complexity. "Where Does Egypt Import Its Wheat From?" N.d. <http://atlas.media.mit.edu/278g29>, accessed on Dec. 23, 2018.
- Theisen, Ole Magnus, Helge Holtermann, and Halvard Buhaug. "Climate Wars? Assessing the Claim That Drought Breeds Conflict." *International Security* 36 (2012): 3, 79-106.
- United Nations. "Climate Change." N.d. www.un.org/en/sections/issues-depth/climate-change/, accessed on Jan. 6, 2019.
- Werrell, Caitlin E., and Francesco Femia. Conclusion to *The Arab Spring and Climate Change: A Climate and Security correlations series*, 51-52. Edited by Caitlin E. Werrell and Francesco Femia. Washington DC: Center for American Progress, 2013.
- Yates, David N., and Kenneth M. Strzepek. "An Assessment of Integrated Climate Change Impacts on the Agricultural Economy of Egypt." *Climatic Change* 38 (1998): 3, 261-287.
- Zwierlein, Cornel. "Historicizing Environmental Security." *European Journal for Security Research* 3 (2018): 1, 1-13.