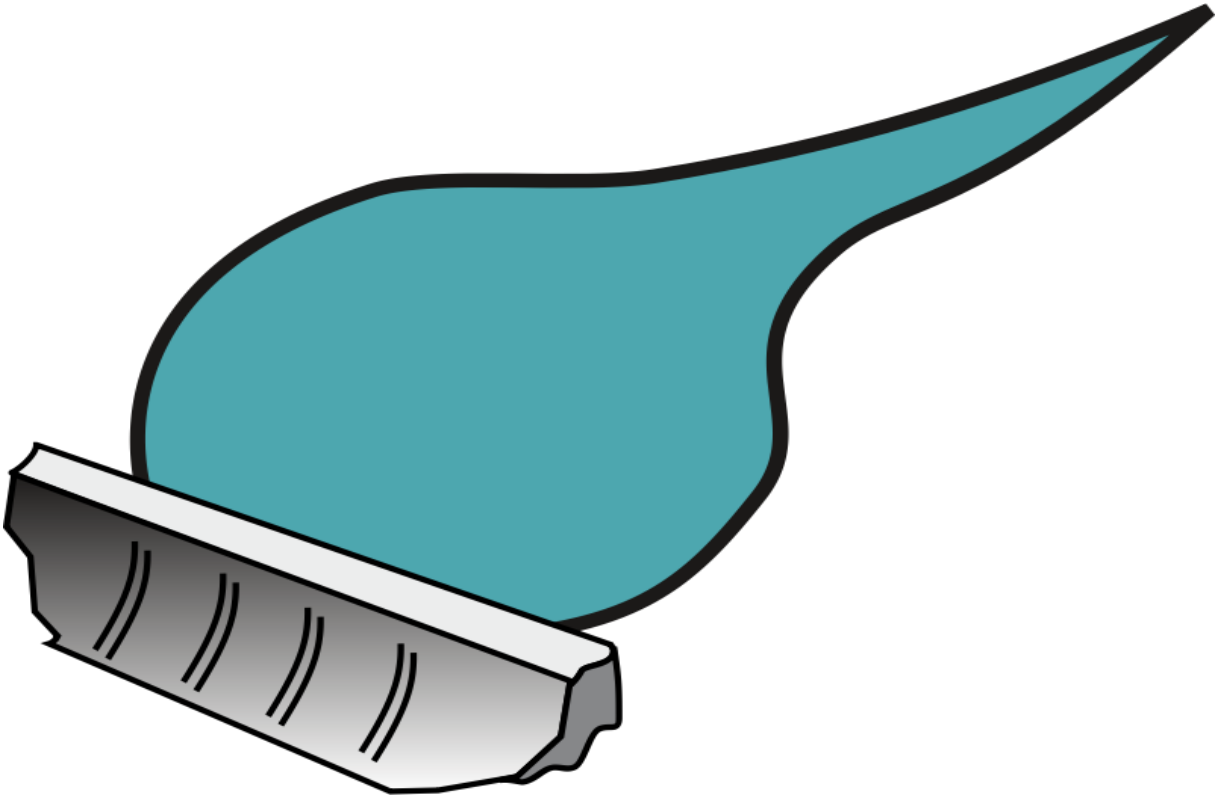
How Turkish-Syrian Freshwater Policy Influenced the Syrian Civil War: An Environmental Security Perspective



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[1] Image by Zille, *Simple stylized dam and reservoir.* Accessed at https://openclipart.org/detail/287771/reservoir.

Abstract

The Malthus theorem about the causal relation between resource scarcity and armed conflict is well known, and to this day heavily contested within the scientific community. However, with human-caused climate change becoming ever more pressing, more attention is given to how resource scarcity might cause armed conflict. Especially freshwater availability and its role in armed conflict.

The Syrian Civil War has also been subjected to various studies which looked at the relation between freshwater scarcity within Syria, mainly caused by natural droughts, and how it might have caused the civil war in 2011. Many previous studies concluded water scarcity was mainly the result of failing Syrian government policy.

More recent research also highlighted the importance to look at *outside*-induced water scarcity by Turkey in Syria and how it relates to the triggering of the Syrian Civil War. This thesis aims to contribute to this previous research by looking at the causal mechanisms behind Turkish freshwater policy in the Euphrates, Tigris, and Orontes basins, and how this policy relates to Syria and the impact on the Syrian Civil War. This thesis concludes that freshwater scarcity on its own is not sufficient enough to explain why Turkey has decided to cut off freshwater to Syria in the Euphrates-Tigris basins. Historical factors and issue-linkage with non-water issues are at the core of Turkish and Syrian water policies.

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List of Abbreviations & Acronyms

AVHRR	Advanced Very High Resolution Radiometer
ET	Euphrates-Tigris
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
GAP	*Güneydogu Anadolu Projesi* (Southeastern Anatolia Project)
GRACE	Gravity Recovery and Climate Experiment
MENA	Middle East and North Africa
MODIS	Moderate Resolution Imaging Spectroradiometer
MFA	Ministry of Foreign Affairs (Turkey)
MoFWA	Ministry of Forestry and Water Affairs (Turkey)
MoU	Memoranda of Understanding
NATO	North Atlantic Treaty Organization
NGO(s)	Non-Governmental Organization(s)
NOAA	National Oceanic and Atmospheric Administration
PKK	*Partîya Karkerên Kurdistanê* (Kurdistan Workers' Party)
PYD	*Partîya Yekîtiya Demokrat* (Democratic Union Party)
RBD	River Basin District
RBMP	River Basin Management Plan
SDF	Syrian Democratic Forces
US	United States (of America)
UN	United Nations
UNICEF	United Nations Children's Emergency Fund
WFD	Water Framework Directive
WW	World War

Introduction

At the start of 2021, Northeast Syria was faced with severe decline in their river levels (ANHA, 2021). Turkey only let 200 cubic meters of water flow into Syria via the Euphrates, which is less than half of the minimal 500 cubic meters agreed upon between the Syrian and Turkish governments in 1987 (ANHA, 2021; VOA, 2021). The water flow from the Euphrates is pivotal for sustaining agriculture, electricity and drinking water supplies in the area (VOA, 2021). Several human rights organizations have stressed that Turkey is using their control over Euphrates water flow as leverage in order to put pressure on the Kurds residing in Northeast Syria (ANHA, 2021). The Turks view the Syrian Democratic Forces (SDF), associated with the Kurds in Northeast Syria, as a terrorist organization (VOA, 2021). The SDF in turn is being blamed by the Turks for the water cutoff, and Turkey denies any involvement themselves (VOA, 2021). This use of water as an instrument of war by Turkey is not a new phenomenon, but one that has occurred for decades (ANHA, 2021; Kibaroglu, 2015).

Several authors have pointed towards outside interference causing freshwater scarcity in Syria over the past years (Mnory, 2017; Karnieli, et al., 2019). Tensions on freshwater availability are especially high between Syria and Turkey (Gleick, 2014; Worldwater, n.d.a). The completion of the Ataturk Dam in Turkey has led to decreased average annual flow of the Euphrates into Syria and Iraq (Gleick, 2014). Syria and Iraq protested against the building of the Ataturk Dam, fearing Turkey would use it as a weapon (Worldwater, n.d.a). This proved to be true, as Turkey threatened to restrict water flow in order for Syria to withdraw their support for the Kurds operating in southern Turkey (Worldwater, n.d.a). Syria is mostly dependent on freshwater for irrigation in the north-east from the Euphrates River, with its main tributaries the Sajur, Balikh and Khabour, which originates in the mountains of eastern Turkey (Karnieli, et al., 2019). This supply is being replenished by precipitation or groundwater, and more than 70 per cent of this river supply is being used for irrigation. The rest is used for electricity and drinking water (Karnieli, et al., 2019). Over 60 per cent of Syria's water resources originate from across their border, most of which passes through the Euphrates basin (Karnieli, et al., 2019). Turkey's geographical position allows them to exert influence over the downstream countries by controlling freshwater flow into these countries.

Apart from the humanitarian implications of freshwater cutoff by dams in Turkey, the cutoff from Turkey impacts the Syrian Civil War as well. Images taken from space indicate that there has been a significant decrease in agricultural yield in Syria, caused by a drop in available irrigation water, and has subsequently resulted in abandonment of farms in Syria in 2010 (Karnieli, et al., 2019). Turkey did not maintain the minimum agreed flow, due to Turkey striving towards realizing their reservoir plans in the Euphrates basin (Karnieli, et al., 2019). Karnieli, et al. therefore argue that reduced water flow caused by Turkey's reservoir policy directly contributed to the 2011 Syrian agricultural collapse, combined with protracted periods of drought (2019).

Turkey is also heavily reliant on its own freshwater deposits, as they too are plagued by protracted periods of drought due to climate change, and mismanagement of policies regarding water distribution (Mnory, 2017). For this reason, Turkey wants to expand their reservoir plans and these plans were to be realized in 2010 if not for budgetary constraints (Mnory, 2017). Turkey is not able to gain more funding by the World Bank due to their disregard of international rules regarding such projects (Mnory, 2017). This funding halt was achieved by the Syrian and Iraqi governments persuading the World Bank, by stating that Turkey should not receive any future funding until a

riparian treaty would be negotiated (Carkoglu & Eder, 2001). Turkey faced similar problems in 1990 when the World Bank stopped funding for the *Güneydogu Anadolu Projesi* (GAP or Southeastern Anatolia Project) dam project, after protests by Iraq, Syria, and Saudi Arabia until a treaty was established between all riparian countries (Dohrmann & Hatem, 2014). Iraq even threatened to bomb the Ataturk dam when Turkey was filling its reservoirs (Dohrmann & Hatem, 2014). However, Turkey is not willing to involve their neighbors regarding water policy, as they view it as a purely domestic issue (Mnory, 2017). This makes future development of dam projects in Turkey difficult and neighborly relations tense.

Even though parts of Syria are currently deprived of freshwater supply by Turkey, the Syrian government is currently not taking any action against the Turks (ANHA, 2021). Syria does not want to jeopardize the Turkish-Russian agreements concerning northeast Syria (ANHA, 2021). Furthermore, Syria has in the past cooperated with Turkey against the Kurds, specifically the PKK, which improved their relation with Turkey in the beginning of the 2000s (Kibaroglu, 2015). This improved cooperation led to a framework on transboundary water distribution between Turkey, Syria and Iraq in 2009 (Kibaroglu, 2015). However, the implementation of this framework has been put on hold due to the Syrian Civil War (Kibaroglu, 2015). As the Syrian Civil War is still not resolved, the freshwater diplomacy between Turkey and Syria remains uncertain.

The Syrian government is on one hand dealing with severe droughts in the northeast due to cut water supplies, but on the other hand wants to keep cooperating with its allies due to the civil war. Both Syria and Turkey are trying to act in their own interests as much as possible concerning freshwater, and this has caused a rocky relationship between the two over the past decades. The relations between Syria and Turkey concerning freshwater distribution are an important factor in attaining a durable solution for the Syrian Civil War.

1.1 Research Objective

In this research project, I examine how Turkey's and Syria's freshwater policy has affected the Syrian Civil War. The main objective is to closely examine how Turkey has used its control over transboundary freshwater resources to exert pressure on Syria in the context of the Syrian Civil War. As described in the introduction, the relation between Syria and Turkey with freshwater is a long and complicated one. At the same time, the Syrian Civil War is a complicated, multi-faceted case. It is, therefore, difficult to compare it to other armed conflicts where freshwater has been a contributing factor, and there is still much debate in the scientific community about how freshwater fits precisely within this jigsaw puzzle.

In this research project, the Malthusian model, which emphasizes how resource scarcity can have an impact on armed conflict, is used as a starting point. I specifically focus on the role of freshwater policy between Syria and Turkey, and how freshwater scarcity may have driven Turkey to cut off water to Syria. The mutual history between the respective countries is vital in understanding current relations. Only after the Syrian Civil War broke out, was more attention given to outside interference in Syria's freshwater supply and its impact on the Syrian Civil War. And, to-date, research on how water politics have affected the Syrian war is focused mainly on the effects of climate change, and internal administrative problems of Syria related to freshwater scarcity.

Missing from these discussions is an analysis of the causal mechanisms behind the freshwater policies of Turkey and Syria in relation to the Syrian Civil War. Water is expected to play a key role in future relations between Syria and mainly Turkey, due to the unfinished negotiations on distribution

of freshwater as a result of the Syrian Civil War (Kibaroglu & Sumer, 2015). Therefore, both Syria and Turkey continue to use fresh water management as an instrument to put pressure on the other party (Gleick, 2014; Mnory, 2017). As freshwater access continues to rise in saliency and its possible role in future armed conflict between Syria and Turkey, it is important to gain better insight on the causal mechanisms on freshwater policy by Syria and Turkey, and how the current lack of a freshwater agreement further protracts the Syrian Civil War.

With this in mind, the thesis sets out the following research question and sub-questions:

How has the freshwater policy by Turkey and Syria, in relation to each other, affected the Syrian Civil War?

Sub Questions:

1. How was the freshwater policy interaction between Syria and Turkey prior to the Syrian Civil War?
2. What is the impact of Turkish freshwater policy, in relation to Syria, on the Syrian Civil war?
3. What is the impact of Syrian freshwater policy, in relation to Turkey, on the Syrian Civil War?

1.2 Main Arguments and Objectives

In this research, the following points are argued. First, contrary to what is argued in most environmental security literature, the Syrian Civil War case shows that natural resources have a more prominent role than just as an intervening variable in armed conflict causation. Syria and Turkey have been struggling for several decades to come to a mutually beneficial agreement on freshwater distribution, which plays a part in their foreign policy towards each other respectively. Control over freshwater supplies is pivotal to both Syria and Turkey, as they both are heavily dependent on freshwater. In turn, Turkey is actively controlling the freshwater supply into Syria and contributing to freshwater shortages in order to deal with its own freshwater scarcity (Yousuf, et al., 2018; Karnieli, et al., 2019).

Second, freshwater scarcity in Syria is also induced externally from Turkey. This outside induced freshwater scarcity in Syria by Turkey has been observed several times throughout the 20th century and is still occurring in the ongoing Syrian Civil War. This induced shortage of freshwater in Syria is one of the drivers of the current conflict in the Syrian Civil War, contributing to further protraction of the conflict, resulting in further deterioration of Turkish-Syrian foreign relations. The Turkish government has used its control over freshwater supplies in order to maintain pressure on the Kurds via the Syrian government, or using freshwater as a tool of war directly. If the goal of ending the Syrian Civil War in a durable manner is to be achieved, diplomatic relations with Turkey concerning freshwater need to improve with Syria. Understanding how freshwater plays a role in these relations can help towards attaining that goal, as freshwater issues tend to be linked with non-water issues.

What can be concluded is that freshwater scarcity alone cannot provide a sufficient explanation as to why Turkey would cut off transboundary freshwater flow into Syria. The historical context plays a vital role, where non-water issues are being linked to water issues. This makes it hard to take apart the various parts in this complex case.

This research has the following objectives. Firstly, this research aims to contribute to the literature of environmental security. Specifically, the aim is to use the Malthusian model as a starting

point, which emphasizes how resource scarcity can have an impact on armed conflict, and take a closer look at externally-induced resource scarcity. This is done by using process-tracing to find evidence of freshwater scarcity induced by Turkey and Syria, with the main focus on Turkey, using water to pressure each country respectively in the Syrian Civil War. This research argues that in contrast to most research done on environmental security and armed conflict, that natural resources are a significant factor in the Syrian Civil War, mainly due to the role they play in the relations between Syria and Turkey.

This research focuses on the relation between Syria and Turkey prior to the Syrian Civil War, and during the conflict, as this relation is pivotal in shaping this respective conflict. This historical analysis is vital in determining the causal mechanisms underlying the freshwater policies of the respective countries. Thus, the end goal of this thesis is to highlight the causal mechanisms through which freshwater scarcity influences relations between Syria and Turkey and how these mechanisms affect the Syrian Civil War. This thesis argues that freshwater availability plays a more significant role in triggering the Syrian Civil War, whereas most other research emphasizes the intervening role freshwater has in the Syrian Civil War. This means that the main focus of this thesis is to look for within-case inference, differing from most other literature in the environmental security theory literature.

1.3 Societal Relevance

The conflict in Syria, which has been waged for over a decade in 2021, is complex in its causes and actors that play a role in it. Due to this complexity, only certain parts of this conflict are on the forefront, such as the Arab Spring and Islamic State. Freshwater is mostly overlooked or seen as an intervening variable in the conflict. However, tensions over freshwater supplies between Syria and especially Turkey have been going on for decades (Gleick, 2014; Worldwater, n.d.a), and have an impact on the Syrian Civil War (Mnory, 2017; Karnieli, et al., 2019). Decreased availability of freshwater has led to internal displacement of the Syrian people from rural to urban areas, leading to increased tensions and eventually uprising (Quinn & Roche, 2015; Karnieli, et al., 2019).

In a time span of 10 years, more than half of the Syrian people have fled the country due to the conflict, mainly to neighboring countries (UNHCR, 2021). Over 3.6 million reside in Turkey alone, and around one million Syrians are currently residing in the EU (UNHCR, 2021). More than 70 per cent of these refugees live in poverty, and lack access to basic needs (UNHCR, 2021). Water has been used as a war instrument by various parties in the Syrian Civil War, and most of the infrastructure has been destroyed (Northrup, 2017). Reconstruction of this infrastructure is biased (Northrup, 2017), as it has been before the war (Barnes, 2009). However, future expectations of increased freshwater scarcity due to climate drought and decreased water flow from Turkey will make it hard for the Syrian people to return to their old homes. This means that the refugees residing abroad will have to stay there permanently, resulting in more tension, especially in Syria's neighboring countries.

1.4 Scientific Relevance

In terms of scientific data, there have been several independent publications on the role of freshwater supply as a root cause for the Syrian Civil War in 2011. However, there has been some debate between various authors about whether one of the causes for the civil war was the increasing

drought in the Middle-East or (deliberate) mismanagement of fresh water supplies (Barnes, 2009; Gleick, 2014; De Chatel, 2014). Most of these studies conclude that water was mainly one of many contributing factors resulting in armed conflict. Specifically, in the field of environmental security, the direct causality of natural resource scarcity leading to armed conflict remains debated (Gleditsch, 2007). Only more recently have more studies looked at the effect of freshwater scarcity caused by neighboring countries, such as Turkey (Mnory, 2017; Karnieli, et al., 2019).

This study aims to add to these previously mentioned studies by looking at the relation between Syria and Turkey before the Syrian Civil War, and how each country's freshwater policy in relation to the other country impacted the Syrian Civil War. This is done by using process-tracing in order to find the causal mechanisms underlying the freshwater policies of Syria and Turkey, by analyzing the historic freshwater policies of the two countries. The aim is to look at how externally-induced scarcity, mainly by Turkey in Syria, has impacted the foreign relations of the respective countries, and its impact on the Syrian Civil War. By using process-tracing, it is easier to determine the reasoning for freshwater-inducing policies and why they are implemented. In the field of environmental security, externally-induced freshwater scarcity has not been covered much. This thesis aims to make a contribution to the field, by looking at the Syrian Civil War case and how externally-induced freshwater scarcity plays a role in conflict triggering and exacerbation.

1.5 Structure

The structure of this paper is as follows. Chapter 1 has introduced the topic of this thesis, and described the dependence of Syria on freshwater and agriculture. Furthermore, the research puzzle including the goals and research questions of this thesis have been laid out.

In chapter 2, the theory of environmental security will be presented, in order to provide an overview of what is already known in the field of environmental security. This is further added on by presenting what is already known regarding freshwater scarcity in Syria in the context of the Syrian Civil War. This theoretical chapter serves as a basis for the analysis in this research.

In chapter 3, the case selection is explained, including the method of analysis of the data, by using process-tracing. In chapter 4 the data analysis is introduced by a historical overview of freshwater conflicts between Turkey and Syria prior to the Syrian Civil War, providing an answer to the first sub-question of this research. Following this historical overview, an analysis on the Turkish freshwater policy during the Syrian Civil War will be presented, which answers the second sub-question of this thesis. After this, an analysis follows on how Syria has used freshwater to exert pressure on Turkey, and how this has impacted the Turkish-Syrian relations.

In chapter 5, all the findings are presented and summarized, followed by a step-by-step analysis of all the relevant parts explaining how freshwater scarcity has triggered and exacerbated the Syrian Civil War. Chapter 6 provides an answer to the main research question of this thesis. This is followed up by a discussion of the obstacles which I came across during this thesis.

2. Environmental Security Theory

Environmental Security Theory has its origins in the essay by Thomas Malthus (1992), where he stated that hunger would be inevitable due to failure of linear food growth with exponential population growth. This would mean that certain resources are bound to dry up and will result in crises (Malthus, 1992). This train of thought is further expanded upon by Neo-Malthusians who apply the same principle to other scarce natural resources (Gleditsch, 2003). While global scarcity is a sufficient condition for local scarcity, it is not a necessity (Gleditsch & Urdal, 2002). Scarcity does play a role in generating and exacerbating armed conflict and Gleditsch & Urdal (2002) describe three forms of resource scarcity:

1. Demand-induced (population growth)
2. Supply-induced (depletion/degradation resource)
3. Structural (distribution resource)

Furthermore, there is the aspect of security and what criteria should be met in order to attain this goal of environmental security (Gleditsch, 2007):

1. Preventing war and armed conflict due to resource scarcity and environmental degradation
2. Preventing disasters other than war due to scarcity and degradation
3. Preventing Earth's carrying capacity erosion leading to loss of future environmental sustainability

The theory on resource scarcity causing armed conflict and wars is a fairly old theory. This means that it has received much critique from various scholars on the relation between resource scarcity and the occurrence of armed conflict. One of these scholars is Holsti (1991), who shows that most conflicts are not caused by resource scarcity, but can mostly be explained by trying to gain territory. Vasquez (1993;1995) found in a reanalysis on Holsti (1991) that next to territorial issues for war, wars mostly occur between neighbors or proximate countries. Territorial disputes are indeed an important factor in causing armed conflicts and wars, but also other possible causes can be at play (Gleditsch, 2007). These other factors are *strategic raw materials, sources of energy, shared water resources, and food.*

Despite growing saliency on global resource scarcity and its role in armed conflict and wars, there is only limited systematic research on these topics still, mainly consisting of case studies on individual conflicts, which are difficult to generalize. More specifically, Gleditsch (2007) provides critique on case study research done in this manner by arguing that there has not been systematic comparison with cases where conflict does not erupt, where environmental degradation is an issue. Environmental degradation can be seen as an independent cause of conflict instead, or as a symptom of societal failure (Gleditsch, 2007). While case study research can be harder to generalize, case study research can provide valuable insights which can complement cross-case quantitative and qualitative studies, when using process-tracing. As process-tracing can provide within-case inferences by opening the black-box underneath the X and Y correlations (Beach & Pedersen, 2013).

Focusing on water scarcity, several authors, such as Phillip Stalley (2003), emphasize that water scarcity does not show any effect on militarized interstate disputes, but there is an effect of high population density and soil degradation. There was an overall measure of environmental scarcity positively associated with interstate conflict (Gleditsch, 2007). Furthermore, Toset, et al. (2000) showed that two countries who share a river have doubled probability of militarized interstate dispute. This shared river effect is less conflict-inducing compared to the neighbor effect. However,

this ‘neighbor effect’ is comparable to political and economic predictors of conflict (Toset, et al., 2000). Moreover, there seems to be some support for a Neo-Malthusian river conflict concerning upstream-downstream relationships in a replicated study. There does not seem to be any evidence that conflict arises due to fuzzy river borders. Also, the issues involved in conflicts between basin sharing countries remain unidentified Gleditsch, et al. (2006).

Water Scarcity in the Middle-East has been argued to have played a role in causing conflicts, but Gleditsch (2007) argues that water can at best be viewed as one of several conflict issues. This is backed up by data that most attacks on water installations in the Middle-East were done as a means of warfare or threat (Gleick, 2000), and therefore cannot be used as evidence that the conflicts there arose due to disagreement about water scarcity. Additionally, Gleditsch (2007) does acknowledge that global climate change may play a role in future conflicts and environmental crises. However, its relation to armed conflicts and wars has to be determined carefully. Instead, Gleditsch (2007) posits that environmental effects on security are tempered by other factors, such as politics, economics, cultural factors and conflict history of the concerned country.

In terms of politics, the level of democracy of a country has an impact on environmental policy and on how environmental conflicts are being handled (Gleditsch, 2007). Democracies are more responsive and more open to trial and error, and engage more often in international fora (Gleditsch, 2007). This openness contributes to policy-making due to the interaction of well-established democracies with protest groups on climate policy. This makes adjustments to these respective countries’ policies possible when being pressured. This means that democracies in general are much less likely to let environmental problems get out of hand, due to scrutiny of pressure groups (Gleditsch, 2007). Additionally, Gleditsch & Hegre (1997) put forward the argument of democratic peace, the theory on why democracies rarely go to war with each other. If democracies rarely go to war with each other in the first place, then it is highly unlikely they will go to war with each other on environmental issues (Gleditsch, 2007).

A second factor is economics, which appears to influence environmental behavior in two ways (Gleditsch, 2007). First, wealth has a strong effect on environmental sustainability, especially when the industry necessary for generating this wealth is in its early stage, it will be more harmful for the environment and human capital (Gleditsch, 2007). Luckily this can be reversed when a postindustrial society has been attained, by investing in better working conditions, waste disposal, etc. (Gleditsch, 2007).

Many problems related to the environment can be linked to poverty problems or as a result of poor economic policy decisions as seen in some postcolonial and communist states (Sen, 1994). However, there is an exception for CO_2 and other greenhouse gas emissions, which only rise with economic development (Gleditsch, 2007). Economic policy is mostly suited to tackle short-term environmental disasters, as long-term economic growth and technological progress is needed for structural problems to be solved (Gleditsch, 2007). Lastly, economic development also restrains violence in environmental conflicts, as wealth is negatively linked to armed conflict both interstate and intrastate (Hegre, 2000). This can be explained due to the unwillingness of wealthy people to lose that generated wealth in armed conflict. If the wealth is more equally distributed, then most people are deterred from using violence (Gleditsch, 2007). Moreover, according to Liberal Peace theory, rich countries trade more and these relations seem to promote peace (Russett & Oneal, 2001).

Third, there are cultural factors at play. Several authors show that division along ethnicity or religion are related to internal conflict where there is ethnic dominance or polarization (Ellingsen,

2000; Reynal-Querol, 2002). In countries where these several groups can cooperate peacefully, environmental problems seem to be solvable, otherwise they stack up on the already existing problems (Gleditsch, 2007).

Lastly, a history of armed conflict in a country is one of the strongest indicators for current conflict, both internally and externally (Raknerud & Hegre, 1997). This is due to the destructive nature of armed conflict on the environment, making natural resources scarcer (Westing, 1985). In turn, this increased scarcity can lead to a new armed conflict and possibly a country can get trapped in a downward spiral of poverty, authoritarian rule, environmental degradation, and violence (Gleditsch, 2007).

2.1 Freshwater Scarcity in Syria

The factors mentioned above suggest that in the field of environmental security theory, the correlation between resource scarcity and armed conflict is not deterministic. Most of the previously mentioned research indicates that either politics, economics, cultural factors and/or conflict history of a country mainly determine whether armed conflict breaks out. Resource shortages are merely an intervening variable. While the Syrian Civil War is a complex case, which include many of the before mentioned factors contributing to armed conflict, the role which freshwater has played in triggering the Syrian Civil War tends to be downplayed in most of this literature. Therefore, a case-centric approach can give better understanding of within-case inferences, where previous studies have mainly looked at relevant variables.

Over the past years, multiple authors have looked at how freshwater is related to armed conflict in the MENA-region. Several authors indicate that prior to the Syrian Civil War, the Syrian government produced scarcity of freshwater themselves, due to its poor agricultural policies (Barnes, 2009; De Chatel, 2014). However, this does not mean that the Syrian government is the only reason for freshwater scarcity in Syria, as freshwater scarcity due to drought has caused parts of the Khabour river to partially dry up in the 1990s (Barnes, 2009).

According to an FAO report, the negative Syrian water balance would not be able to provide enough agricultural yield for the growing population (Varela-Ortega & Sagardoy, 2001). Barnes (2009) showed that the notion of freshwater scarcity being related to population growth, due to the need for more irrigated agriculture to feed the growing population, does not hold up for Syria. Most of the agricultural land is being rain-fed, only a fraction is dependent on irrigation (Barnes, 2009). Irrigation has been increasingly used for wheat production over the years for higher yield, however irrigation use has mainly increased for the production of cotton (Barnes, 2009). The production of cotton, which is heavily reliant on irrigation has increased since the 1990s, along with other industrial crops such as tobacco and sugar beet (Barnes, 2009). Furthermore, Syria has produced a surplus of wheat used for export, meaning that increased water use was not due to population growth (Barnes, 2009).

Next to increased production of industrial crops dependent on irrigation, the Syrian government also manipulates data on freshwater availability in Syria (Barnes, 2009). Below in figure 1, a map of Syria can be seen which was used by the Syrian Ministry of Agriculture, based on data provided by the World Meteorological Organization, the Food and Agricultural Organization of the United Nations, and the Scientific and Cultural Organization in the 1960s (Barnes, 2009). This map is based on mean annual precipitation, along administrative boundaries (Barnes, 2009). What was

missing from this map were other important factors, such as evaporation rates, soil type, and even newly constructed canals used for irrigation (Barnes, 2009). As these zones were drawn along administrative borders, the Syrian government was able to prohibit irrigation in zone 5, which has less rainfall according to figure 1, even though water scarcity might not have been acute (Barnes, 2009). These restrictions on irrigation do impact the yield of farmers in the concerning zone, impacting their livelihood (Barnes, 2009). This means that the Syrian government can exert influence based on skewed data.

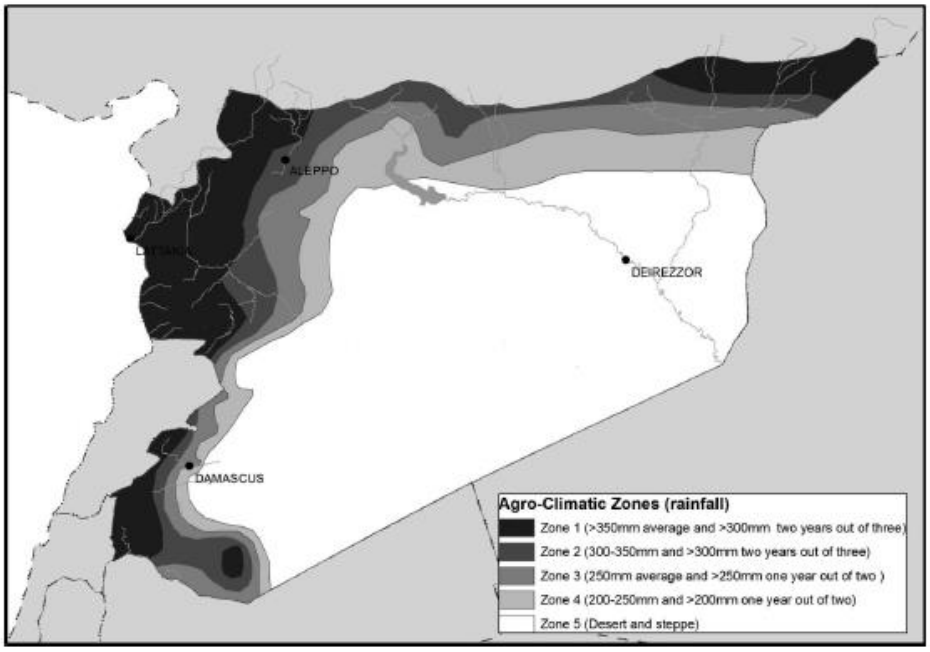

Figure 1 Zone boundaries in Syria. Source: Barnes, 2009, p. 516.

On top of manipulation of agro-climatic zones by the Syrian government, the Syrian government has divided the country into seven blocks of drainage basins (shown in figure 2 below). These seven drainage blocks do not overlap with the nine surface water basins, which are defined hydraulically. This means that some tributaries are assigned to a different basin on paper, than to which they hydraulically attach in reality (Barnes, 2009). For instance, the Khabour river is stated as part of the Tigris basin, while it is in fact part of the Euphrates basin (Barnes, 2009).

The implication of the data in these maps is that it gives the Syrian government power to implement certain policies. For example, the Syrian government prohibits the use of irrigation in certain areas and can use these maps as justification of water scarcity in certain regions (Barnes, 2009). The incumbent Ba'ath party under Al-Assad has its roots in agriculture and uses agricultural policy in order to exert its influence over the peasantry in Syria, which are the main supporters of the Al-Assad regime (Barnes, 2009). This extends to the building of dams in Syria, which showcase the capabilities of the Ba'ath regime and their link to agriculture. It is pivotal for the Ba'ath party to show its support for the agricultural sector, as it is one of the main sources of income for Syria (Barnes, 2009).

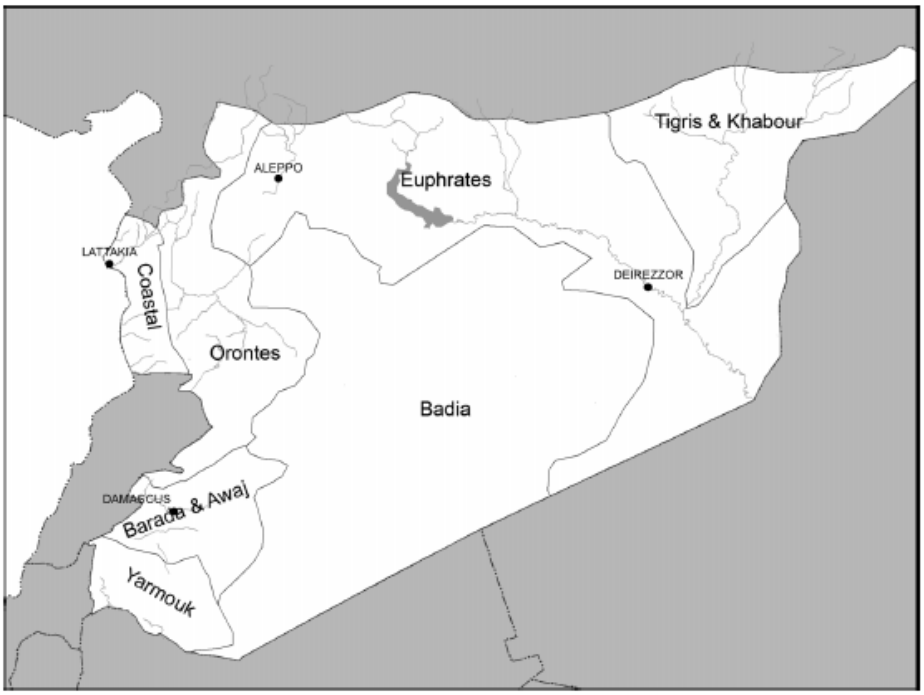

Figure 2 Map of basins used by the Syrian government. Source: Barnes, 2009, p. 518.

The issues of freshwater mismanagement by the Syrian government are acknowledged by several authors, such as Gleick (2014) and De Chatel (2014). However, Syria has been confronted by several years of continued drought from 2006 until 2011 (Gleick, 2014; De Chatel, 2014). Between 2006 and 2009 yields of wheat and barley dropped by 47 and 67 percent respectively, due to droughts. Another drought hit Syria in 2011, and together these events led to more than 1.5 million people to move from the rural areas to the major cities in Syria (Gleick, 2014). Gleick (2014) also illustrates in accordance to Barnes (2009), that the Al-Assad regime gave large sums of subsidies for water-intensive crops, such as cotton and wheat.

Moreover, aside from these problems, Syria is using inefficient methods of irrigation for their crops. Less than 20 percent of the irrigated areas use modern sprinklers or drip irrigation, instead most irrigation water is drawn from groundwater sources, which are not sustainable (Gleick, 2014). Furthermore, it is briefly touched upon that Turkey is withdrawing water upstream to meet their own agricultural needs. All these factors, combined with the inability of the Al-Assad regime to counter the effects of the drought led to civil unrest. While measures had been taken in order to improve water infrastructure in rural areas prior to the Syrian Civil War, these came at the unforeseen cost of increased local water shortages and farmland salinization (Gleick, 2014; De Chatel, 2014).

Additionally, the looming issue of increased drought occurrence due to climate change is becoming more apparent (Shown in figure 3). An increase of evapotranspiration and decrease of winter rainfall is becoming more common, most likely caused by human-caused climate change (Gleick, 2014). One of the areas which is projected to be the most fragile to continued periods of drought and reduced precipitation, is the region in southern Turkey and northeast Syria. The relation between human-induced climate change and increased drought is difficult to prove. However, most projections show that the MENA-region will be hit relatively hard in the near future (Gleick, 2014).

The implications of these droughts remain uncertain, as the outcomes also depend on global market access, and agricultural policy (Gleick, 2014). De Chatel (2014) adds that the most important factor in the cause of the civil uprisings in Syria, is the systematic failure of the Assad regime in the past 50 years to manage their natural resources. Stating that climate change had a significant effect on causing civil unrest in Syria in 2011 would undermine the main cause of the Assad regime's inability to reform (De Chatel, 2014). The unrest is mainly the result of rapid economic liberalization, sudden stop of government subsidies, and government failure to provide a solution to long standing humanitarian and environmental issues (De Chatel, 2014).

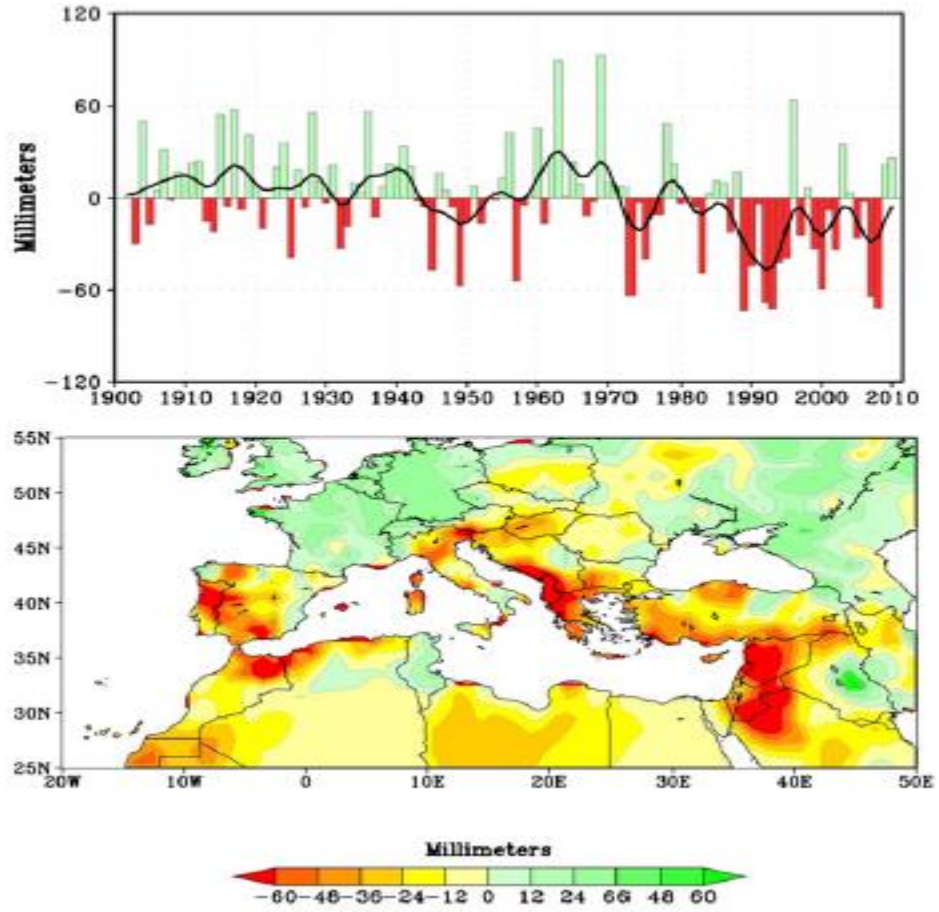

Figure 3 Millimeters of winter rainfall in 1902-2010, with a rainfall drop in 1971-2010. Red and orange areas show increased winter droughts in 1971-2010 compared to 1902-2010. Source: Gleick, 2014, p. 336.

Looking back at the beginning of this chapter, three factors of natural resource scarcity have been described, which relate to causing or exacerbating armed conflict (Gleditsch & Urdal, 2002). These three factors are demand induced-, supply induced- or structural scarcity of natural resources (Gleditsch & Urdal, 2002). Most literature focused on the start of the Syrian Civil War fits within these three explanations. Issues such as, growing population (demand induced scarcity), climate change (supply induced scarcity), and governmental water mismanagement by Syria (structural scarcity) have been thoroughly discussed. What is still missing in this complex puzzle is the supply induced scarcity caused from *outside* of Syria. While it has been briefly stated that Turkey is withdrawing freshwater upstream, which negatively impacts supply in downstream Syria (Gleick, 2014), there has only recently been some coverage by the scientific community on deliberate policy of creating freshwater scarcity by Turkey. The aforementioned literature seems to agree with each

other that water scarcity has played a role in causing the Syrian Civil War, but mainly point to the failure of the Syrian government policies as the main cause.

However, it is important to also note the impact of the long history between Syria and Turkey concerning distribution of freshwater, related to the Syrian Civil War. This discussion is in need of more attention because the Syrian-Turkish relation regarding freshwater goes back several decades with various ups and downs, where freshwater has been either used as a tool, casualty or trigger of war. Turkey, Syria and Iraq have come close to an agreement for transnational water distribution in 2009, but this agreement was never implemented, due to the outbreak of the Syrian Civil War (Kibaroglu, 2015).

Related to the Syrian Civil War, there is some evidence that suggests that supply-induced scarcity caused by diversions in the Euphrates basin by Turkey, led to significant drops in agricultural yield in 2010 Syria (Karnieli, et al., 2019). Other authors have shown that Turkey has used freshwater cutoff as a policy instrument in order to exert pressure on Syria over the past years (Worldwater, n.d.; Mnory, 2017). This tactic is still applied in 2021, where Turkey evidence suggests that Turkey is actively undermining previous agreements on minimal water flow (ANHA, 2021; VOA, 2021). The water flow in Euphrates-Tigris basin in the next century could be reduced by 30 and 60 percent respectively for the two rivers, making freshwater scarcer in Turkey, Syria and Iraq (Climate Diplomacy, n.d.a). The need for an agreement between the riparian countries, especially between Syria and Turkey, is needed to make sure freshwater will be distributed fairer among the riparian countries, in the face of more frequent future droughts. The aim of focusing on externally supply-induced freshwater scarcity is to add to the previous literature on Syria, that freshwater scarcity can be a trigger for armed conflict, contrary to what most environmental security theory scholars have shown. This is due to the Syrian Civil War being a unique case, where the dynamics between Syrian-Turkish freshwater politics have an important role. In the next section the case selection is further explained and will be followed up by a historical overview of freshwater disputes in the Euphrates-Tigris basins.

3. Case Selection & Methods

The method used in this thesis is that of an explanatory single-case study. The case study is best suited to gain more insight of complex social phenomena (Yin, 2014). The aim of this case study is to gain a better understanding of the causal mechanisms behind the freshwater policies of Turkey and Syria, and their effect on the Syrian Civil War. In order to achieve this goal, this thesis will make use of the method of process-tracing.

The main focus of this thesis is on Turkey, as preliminary analysis showed that Turkey has induced water scarcity in Syria due to limited resources. This research deals with an ongoing complex case, the Syrian Civil War, with a long history in which freshwater policy by Turkey and Syria have played a significant role. For this reason, the method of explaining-outcome process-tracing is best suited in order to get to a minimally sufficient explanation of the case outcome, as the goals of this research are case-centric (Beach & Pedersen, 2013). Sufficient is defined as follows, that all important aspects are accounted for and without any redundant parts (Beach & Pedersen, 2013).

As previously shown in the theory chapter, there have been numerous quantitative studies on the relation between resource scarcity and armed conflict, also in the MENA-region. Additionally, several case studies have been conducted on Syria where the relation between freshwater scarcity

and armed conflict have been studied. This study aims to contribute to this body of literature by studying the causal mechanisms of freshwater policy, by going beyond the correlations of X and Y in most environmental security theory literature. Process-tracing differs from most other case study research by making within-case inferences (Beach & Pedersen, 2013). This is important in order to understand how the relation between X and Y works. Beach & Pedersen (2013) provide a definition for causal mechanisms best suited for case-centric analyses, which this study will use:

> ''In case-centric analyses, a mechanism is often considered a loose conglomerate of systematic and nonsystematic parts that together account for a particular outcome.'' (Beach & Pedersen, 2013, p. 23-24).

Nonsystematic parts are case-specific and these mechanisms do not occur in other cases. Systematic parts are mechanisms that do occur in multiple similar cases and can be used for guidance when analyzing data (Beach & Pedersen, 2013).

The Syrian Civil War is a complex case, lasting for over a decade. Therefore, the best way to study this phenomenon is by using a single-case study. This is due to the uncontrollability of the behavioral events of the case and the conflict being a contemporary phenomenon (Yin, 2014). The complexity of this case makes it necessary to use qualitative methods of analysis, rather than quantitative ones. The reason for this method of analysis is to gain deeper understanding of the underlying causal mechanisms concerning freshwater in the Syrian Civil War, for which textual analysis is better suited than correlating multiple variables.

In order to create a minimally sufficient explanation of the case outcome, a careful historical analysis is needed to find sufficient evidence for the outcome explanation. This thesis follows the deductive path, where previous literature is used as a starting point, giving clues for potential causal relations (Beach & Pedersen, 2013). Eclectic theorization is used to create a minimally sufficient explanation where initial mechanisms are complemented by case-specific mechanisms in an iterative process (Beach & Pedersen, 2013).

The data in this case study are derived from various reports of international organizations, NGOs, governments, and scientific literature. This way, the data from these sources can be cross referenced in order to make sure the findings are as accurate as possible. Findings from this case will be hard to generalize, due to the complexity of the Syrian Civil War, making this case unique. However, this case can still provide new insights into how freshwater scarcity, induced by an external actor, can trigger and exacerbate an armed conflict.

The dependent Y-variable in this thesis is 'The Syrian Civil War', which is dependent on the independent X-variable 'Freshwater scarcity in the Levant'. The aim is to examine the causal relation between these variables, by looking at the underlying causal mechanisms focusing primarily on Syria and Turkey. This is in line with the Malthus theorem, which states that resource scarcity results in armed conflict, which is the starting point of this thesis.

Preliminary research indicates that freshwater scarcity in mainly Turkey has influenced Turkey's freshwater policy. This resulted in Turkey cutting off freshwater supply to downstream Syria which was a trigger for the Syrian Civil War (Karnieli, et al., 2019). Furthermore, the freshwater cut off increased tensions with Syria by using freshwater scarcity as leverage in the Syrian Civil War (Worldwater, n.d.; Mnory, 2017). The Syrian Civil War in turn caused freshwater diplomacy between Syria and Turkey to cease, making reconciliation difficult (Kibaroglu, 2015). However, Syria is also using water to pressure Turkey in the Orontes basin (Conker & Hussein, 2020), making this puzzle even more complex.

By using process-tracing, the underlying causal mechanisms of this complex relation are laid out. In order to find evidence for these mechanisms, the historical relation between Turkey and Syria regarding freshwater distribution has to be closely examined. More specifically, the steps leading up to these countries' respective policies are being laid out, with the aim of finding a minimally sufficient explanation for these policies in triggering and exacerbating the Syrian Civil War. Thus, the evidence should show that freshwater scarcity in the Levant has shaped the freshwater policies of Syria and Turkey into triggering and exacerbating the Syrian Civil War. This analysis begins by examining the historical interactions between Syria and Turkey regarding freshwater distribution in relation to conflict.

In the figure and table below, the starting points of this research are visualized. This starts with the premise that resource scarcity is responsible for the occurrence of armed conflict according to the Malthus theorem. This is further built upon in the Syrian case by showing that externally induced freshwater scarcity by Turkey led to crop failure in Syria. This then caused migration from rural to urban areas, creating conditions which resulted in uprisings in the Syrian cities and civil war (Karnieli, et al., 2019).

Malthus theorem conceptual model:

Figure 4 Conceptual model Malthus theorem.

Preliminary research on causal relations triggering the Syrian Civil War (Karnieli, et al., 2019):

Table 1 Causal parts of how Externally-induced freshwater scarcity led to triggering of the Syrian Civil War.

Cause	part 1	part 2	part 3	Outcome
Externally-induced freshwater scarcity	Failed crops in Syria	Migration from rural to urban areas	Uprisings in Syrian cities	Syrian Civil War outbreak

4. Historic Overview Freshwater Basin Disputes

This chapter provides an overview of the freshwater disputes between Syria and Turkey and how the relations between the two countries have developed over time. This chapter mainly focuses on the disputes between Turkey and Syria regarding the Euphrates-Tigris basin.

4.1 Syrian-Turkish freshwater disputes 1920-2011 Euphrates-Tigris

Located in the 'Fertile Crescent', water and agriculture have always been important factors in Turkey and Syria during their extensive histories. This is demonstrated by the many wars that have been waged in the ancient past, as well as modern times, in the MENA-area, where water was either the trigger, a weapon, or a casualty (Worldwater, n.d.b). In recent conflicts, water has been increasingly playing a role, mainly as a contributing factor in the cause of conflict (Gleick, 2014). This increased water violence is especially present in development disputes and economic development (Gleick, 2014). In the case of the Syrian Civil War (2011-present), there have been debates on the precise role of water in the scientific community on natural resources and their relation to armed conflict. Looking at the history of water conflicts in Syria, several recent conflicts can be observed between Syria and Turkey before the Syrian Civil War (Worldwater, n.d.a).

The foundations of the current freshwater agreements in the Levant can be traced back to the post-WW1 period, with an agreement between the French and British mandatory governments of Syria and Iraq on the use of water in the Euphrates-Tigris basin (Dohrmann & Hatem, 2014). In 1926 and 1930 this agreement was further expanded upon by the Turco-French protocols on coordinating the use of the Euphrates (Dohrmann & Hatem, 2014). Turkey and Iraq signed the Treaty of Friendship and Good Neighborly Relations in 1946, to exchange data, consult each other on water usage and to implement agreements (Dohrmann & Hatem, 2014). However, in all these previous agreements and treaties, Syria was left out of the loop (Dohrmann & Hatem, 2014).

Still, in the period of the 1920s until the 1950s relations between the riparian countries of Turkey, Syria and Iraq were mostly friendly, as each country was focusing on building their own administrations and economies (Kibaroglu & Scheumann, 2013). During this period, there were no large-scale water development projects yet, so the riparian countries were able to satisfy their freshwater needs from the natural water flow of the Euphrates and Tigris (Kibaroglu & Scheumann, 2013). Despite peaceful relations, mutual distrust and antagonism between Turkey and Syria since Syria's independence in 1946 was taking shape. This animosity was caused by the reliance of both Syria and Turkey on the shared river waters for developing their agriculture and hydropower (Dohrmann & Hatem, 2014).

In the 1960s, trilateral negotiations between Turkey, Syria and Iraq commenced (Dohrmann & Hatem, 2014), after several thousands of years of relative peace concerning transboundary water flow (Worldwater, n.d.a). These negotiations were needed due to the unilateral large-scale water projects being uncoordinated between the three riparian countries (Kibaroglu & Scheumann, 2013). At first, these projects mainly focused on flow regulation in case of flooding or drought, but quickly expanded to hydropower generation, increased irrigation, and drinking water needs (Kibaroglu & Scheumann, 2013). These unilateral needs exceeded the available freshwater supplies, leading to the three riparian countries reaching out towards each other to come to a durable agreement (Kibaroglu & Scheumann, 2013).

An agreement would prove hard to achieve in practice, due to the riparian countries being divided along Cold War ideology lines (Kibaroglu & Scheumann, 2013). Turkey was and still is a NATO member, while Syria and Iraq had ties to the USSR (Kibaroglu & Scheumann, 2013). For instance, in 1973 the Tabqa dam was constructed in Syria with aid from the Soviet Union (Dohrmann & Hatem, 2014). The construction of the Turkish Keban dam and later the Syrian Tabqa dam in the first half of the 1970s, led to heavily decreased river flow downstream. As a result, tensions between Syria and Iraq came to a peak by nearly ending in war between the two countries (Akanda, et al., 2007). In 1986 and 1990 Syria had built two more dams in order to expand its hydropower capacity, but the

GAP project in Turkey would drastically decrease the water inflow from Turkey into Syria, on which these dams rely on (Dohrmann & Hatem, 2014).

The GAP project, consisting of multiple dams, during the 1980s in Turkey made sure that Syria was challenged in realizing their agricultural and hydropower goals, due to projected decreases in freshwater flowing into Syria by 50 per cent caused by the GAP (Dohrmann & Hatem, 2014). While these significant decreases led to increased tensions between Turkey and Syria, the animosity between the two respective countries also largely stem from ideological rivalries during the Cold War (Dohrmann & Hatem, 2014). Turkey was an ally of the US and they both shared the view of Syria building up Soviet arms at the height of the Cold War. Despite being allied to the US, Turkey lent support to the Arab countries in the disputes between the Arab countries and Israel in the 1960s and 1970s. The 1980 coup in Turkey soured the relations between Syria and Turkey again (Dohrmann & Hatem, 2014).

However, despite these ideological differences, the riparian countries managed to come to an informal agreement in 1987 (Dohrmann & Hatem, 2014). This agreement stated that Turkey had to let a minimum of 500 cubic meter per second into Syria and Iraq for consumption (Dohrmann & Hatem, 2014). Since the signing of this treatment, the Turks have unilaterally not upheld the minimum flow into Syria and Iraq, often without any warning (Dohrmann & Hatem, 2014). The minimum flow of water was not maintained due to Turkey filling up a new reservoir in the dam system, cutting off the water flow for around a month (Akanda, et al., 2007).

The Syrian and Iraqi governments claimed not to have been informed by Turkey, and Iraq threatened to bomb the dam (FAO, 2008). However, Turkey insisted that it had informed the riparian countries of the water flow cut off for the duration of a month, which was caused by 'technical issues' (FAO, 2008). After the dam became operational again the water flow was restored, but freshwater demand in both Syria and Iraq had increased in the meantime, resulting in heightened tensions and nearly resulting in armed conflict (Akanda, et al., 2007; Dohrmann & Hatem, 2014).

Turkey made use of its elevated geographical position, putting Turkey in a position of power in relation to downstream Syria and Iraq concerning the Euphrates-Tigris basin. Turkey made a proposal to Syria and Iraq for a 'three-stage' plan regarding the 'optimum, equitable, and reasonable utilization' of the Euphrates and Tigris waters (Akanda, et al., 2007). Syria and Iraq protested, stating that this proposal was only about the Euphrates. By agreeing to this plan Turkey would be able to justify decreasing the water flow in the Euphrates into Syria and Iraq, as Syria and Iraq would also have access to the Tigris, which does not supply as much water as the Euphrates (Akanda, et al., 2007).

In 1990 tensions between Turkey, Syria and Iraq would rise again after Turkey began filling their Ataturk dam, which would cut off the Euphrates water flow into Syria and Iraq. Syria and Iraq would put aside their long-standing differences and work together against Turkey (Akanda, et al., 2007). During the 1990s, the three countries, especially Syria, have invested in their arms in order to increase their power in the region. During this period mobilization of troops near the Iraqi-Syrian border, as well as the Syrian-Turkish border have occurred multiple times, relating to issues on the Euphrates (Akanda, et al., 2007). It is likely that water will be used as a tool of pressure in this region, which has also been promoted by NATO after the Iraqi invasion of Kuwait (Akanda, et al., 2007).

In 1992, tensions between Syria and Turkey became more severe after the completion of the Ataturk dam in Turkey as part of the GAP (Gleick, 2014). The completion of this dam, in combination with decreased precipitation in the Turkey-Syrian border area, have led to decreased annual water

flows over the past decades (Gleick, 2014). This same dam has also been used as a tool by Turkey to put pressure on Syria into withdrawing their support for the Kurds which were active in southern Turkey (Worldwater, n.d.). Syria lent support to the PKK leaders by sheltering them from Turkey, leading up to an ultimatum by Turkey in 1998. Syria withdrew its support from the PKK and relations between Turkey and Syria eased (Dohrmann & Hatem, 2014).

As can be seen in the history of the Euphrates-Tigris basin riparian countries regarding freshwater distribution, induced freshwater scarcity has nearly led to armed conflict several times. In the beginning of the 1970s and 1990s induced freshwater scarcity served as a direct trigger nearly resulting in armed conflict. In various other instances, freshwater scarcity was linked to other polarizing issues between the riparian countries, and part of the trigger for near armed conflict situations or used as a weapon to exert pressure. The total amount of freshwater in the Levant seems to be not enough to satisfy the increased demands of all riparian countries simultaneously, which are then combined with old feuds.

4.1.1 A shift towards cooperation

In December 1999, Turkey was declared to be a candidate country for the EU, which caused Turkey to shift in its policy stances regarding water management (Kibaroglu, 2015). With this declaration in mind, Turkey had to make sure their policies regarding water management would fit within the EU Water Framework Directive (WFD) and the attached legislation (Kibaroglu, 2015). Most notably within this framework was article 13 of the WFD which stated:

> ''If transboundary effects occur within a river basin, the EU member states concerned must establish an international River Basin District (RBD) and coordinate the implementation of the EU WFD through a single River Basin Management Plan (RBMP). Where a RBD extends beyond the territory of the EU, the EU member states concerned must seek appropriate coordination with the non-EU riparians in order to achieve the EU WFD objectives.'' (European Communities, 2000, p. 16).

This directive made sure Turkey began designing plans for the several (transboundary) river basins in Turkey around 2009, however Turkey said it would not implement the ''(...) coordination with the non-EU riparians (...)'' until after Turkey was a full EU member (Kibaroglu, 2015). However, the EU WFD heavily influenced Turkey in their draft of a memoranda of understanding (MoU), signed by Syria and Iraq in 2009, regarding the use, development, and protection of the water resources of the Euphrates, Tigris and Orontes rivers (Kibaroglu, 2015). Despite the political will of highly placed politicians from Turkey, Syria, and Iraq, the MoUs have not become legally binding, due to failure to meet legal procedures in their respective parliaments (Kibaroglu, 2015). Turkey was however willing to implement these MoUs according to *pacta sunt servanda* after this failure, but eruption of the Syrian Civil War in combination with Turkish-Syrian relations taking a downturn made this not possible thus far (Kibaroglu, 2015).

January 2010, Turkey and Syria came to an agreement to develop the lands close to their shared borders, and Syria could expect to import electricity produced by the GAP in Turkey (Dohrmann & Hatem, 2014). In January the following year, Turkey put aside speculation of depleting water resources which would lead to conflict by announcing the construction of 18 dams in cooperation with Iraq, Syria, Iran, Georgia, Bulgaria and Greece (Dohrmann & Hatem, 2014). The construction of the first dam of this project already commenced between Syria and Turkey, which is known as the 'Friendship Dam', along the Orontes (Dohrmann & Hatem, 2014). The start of the Syrian Civil War in March 2011 put a stop to the improving relations between Turkey and Syria.

4.2 Turkish Freshwater Policy after 2011

The previous paragraph illustrated the various conflicts between Turkey and Syria on freshwater distribution over the last decades. Those historic events provide some clues as to why Turkey has been using their power of freshwater to influence Syria. In this chapter, more focus will be put on more recent examples of Turkey cutting off the freshwater flow into Syria, what its consequences have been, and how Turkey has justified those from 2011 until 2021. At the core of Turkey's policy, differences in definition with other riparian countries on freshwater distribution can be observed.

Since the creation of the GAP dam project in the 1980s, the Turkish government has created a bureaucratic force to deal with issues regarding transboundary water policies. A Directorate General under the Ministry of Foreign Affairs (MFA) has been installed, with the responsibility for energy, water, and environment (Kibaroglu, 2015). The Turkish MFA's stance has always been that water is a reason for cooperation and not a source of conflict, by stressing their principle of good neighborliness (Kibaroglu, 2015). The Turkish MFA is supported by a number of other institutions and ministries, of which the 2011 reformed Ministry of Forestry and Water Affairs (MoFWA) is the most important one (Kibaroglu, 2015).

In dealing with the interests of other riparians, Turkey makes a distinction between 'transboundary' and 'international' rivers. International rivers form a border between countries, and the bordering countries can use the waters from this river 'equally'. However, regarding transboundary rivers, which flow from one country into another, Turkey insists on allocation of these resources in a 'equitable' fashion (Kibaroglu, 2015).

The stance regarding transboundary waters is again evident when looking at the failed MoUs between Turkey, Syria, and Iraq, despite the shift towards more cooperation by Turkey as a result of EU candidacy (Kibaroglu, 2015). Despite the failure of these bilateral MoUs, Turkey still used the terminology as stated in the EU WFD in order to create a new legislative draft to restructure water policy at the domestic level in October 2012, with the MoFWA acting as the leading authority (Kibaroglu, 2015). This was done to make sure that Turkey's national legislation regarding freshwater is in line with EU directives. Despite these efforts, the draft was mainly focused on boundary water, and no effort was making a uniform approach concerning transboundary waters in line with the EU WFD (Kibaroglu, 2015).

The Euphrates-Tigris (ET) basin forms the reference point for Turkey in determining their transboundary water policies, which have come forth through previous relations between Turkey with Syria and Iraq (Kibaroglu, 2015). Turkey's first principle is that water is a basic need, and that Turkey always intends to provide as much water flow as possible in order to satisfy those basic needs of the downstream countries (Kibaroglu, 2015). This needs-based approach forms the basis of Turkey's transboundary water policy. Turkey claims that 'sovereign right to use water' and 'equitable, reasonable and optimum use' are at the core of their transboundary water policy. But at the same time, Turkey does not want to recognize the claims of the downstream riparian countries of co-sovereignty on the upstream waters, or vice versa (Kibaroglu, 2015). Furthermore, Turkey is against the involvement of any third-party mediator in transboundary water disputes (Kibaroglu, 2015).

Turkey does not want to concede with Syria and Iraq's demands in simply sharing the available freshwater resources, but advocates for a benefit-sharing approach. This entails joint inventory studies on water and land resources, resulting in the shared dam projects on a bilateral

basis, such as the 'Friendship dam' between Syria and Turkey (Kibaroglu, 2015). Turkey claims this approach is more in line with their historical position and that it would be a non-zero-sum solution, in which every party would benefit concerning hydropower and irrigation (Kibaroglu, 2015). This is a shift from the 1992 stance of the Turkish prime Suleyman Demirel, who stated that Turkey should have complete sovereignty over their own water resources, because Turkey does not say what Syria or Iraq should do with their oil (Salameh, 2021). However, the Turkish MFA still holds sovereignty of natural resources in high regard, as long as 'no significant harm' is caused by using these resources for downstream riparians (Ministry of Foreign Affairs Republic of Turkey, n.d.)

Turkey states that it is not a freshwater-rich country, nor is it the richest country in the area, as Turkey possesses less than 10000 cubic meters of water per capita (Ministry of Foreign Affairs Republic of Turkey, n.d.). On top of that, the freshwater resources are getting scarcer and are not always available at the right time, due to increased urbanization and industrialization, which are dependent on hydropower (Ministry of Foreign Affairs Republic of Turkey, n.d.). This increased energy demand makes Turkey want to meet this demand by developing more hydropower projects, as Turkey does not want to be dependent on gas or oil (Ministry of Foreign Affairs Republic of Turkey, n.d.).

4.2.1 Turkey inducing freshwater scarcity in Syria

In the previous sections, it has been clear that the Turkish government is in a clear position of power vis-à-vis the downstream riparian countries such as Syria and Iraq concerning the Euphrates-Tigris basins. Turkey has used this power in order to weaponize freshwater and create outside induced scarcity to pressure downstream riparians in a policy direction which is favorable to Turkey. Despite more cooperation in the last decades with the other riparians, Turkey still holds sovereignty over natural resources in high regard to this day (Ministry of Foreign Affairs Republic of Turkey, n.d.). Furthermore, Turkey has to deal with increased domestic energy demands and relies on hydropower to cope with this demand, making the construction of more dams in the near future likely. Additionally, Turkey has in the past filled up its reservoirs which led to induced scarcity in the downstream riparians of the Euphrates-Tigris basin. Moreover, Turkey has shown that it does not shy away from using its control over freshwater resources to pressure downstream countries. In the following section several examples of this outside induced scarcity by Turkey in Syria will be shown shortly prior to and during the Syrian Civil War.

A recent study with data on peak winter and summer growing seasons provided by spaceborne imagery has yielded some interesting results. The data consisted of two 16-day periods, one from March 5 to 20 which is the end of the winter season, and one from August 20 to September 12 for the summer season (Karnieli, et al., 2019). The satellite images were taken in the period from 1982 to 1999, and from 2000 to 2015, and combined they form a 33-year time-series dataset, known as the Normalized Difference Vegetation Index (NDVI) (Karnieli, et al., 2019). A high NDVI indicates dense and healthy vegetation, in contrast with soil with a low NDVI. These data points are taken over a long time span, also including areas which are harder to reach and monitor. This makes this data useful, as it can point towards climate and/or human-induced changes which have not been reported directly on the ground (Karnieli, et al., 2019). The areas in question are located in southeast Turkey and northeast Syria.

Until 2009 the annual mean NDVI values for September were steadily growing in both Syria and Turkey, shown in figure 5. This pattern was interrupted in 2010 when a sharp increase in NDVI

was observed in Turkey, pointing towards expanded agricultural activities, whereas the NDVI decreased around the same time in Syria (Karnieli, et al., 2019). A time series of Landsat images observed a similar trend as the NDVI (Karnieli, et al., 2019).

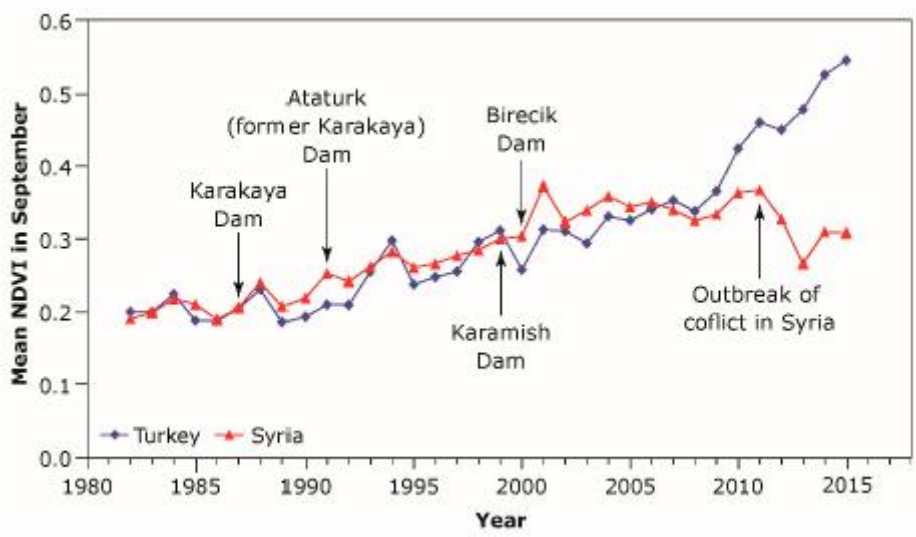

Figure 5 Time series of mean Normalized Difference Vegetation Index (NDVI) in September in Turkey and Syria. Data derived from a combined dataset of NOAA-AVHRR and MODIS spaceborne systems. Source: Karnieli, et al., 2019, p. 6.

In the Mediterranean area, March marks the end of the rainy season when agriculture is less dependent on irrigation during that month, compared to September when the rainy season is about to begin. This explains the higher yield in wheat production in Syria in 2011, shown in figure 6. Differences in NDVI are not significant in the month of March in both 2011 and 2015. However, significant differences in the NDVI can be observed between Syria and Turkey in September 2011. The contrast is even more significant when compared to September 2015, shown in figure 6 down below (Karnieli, et al., 2019).

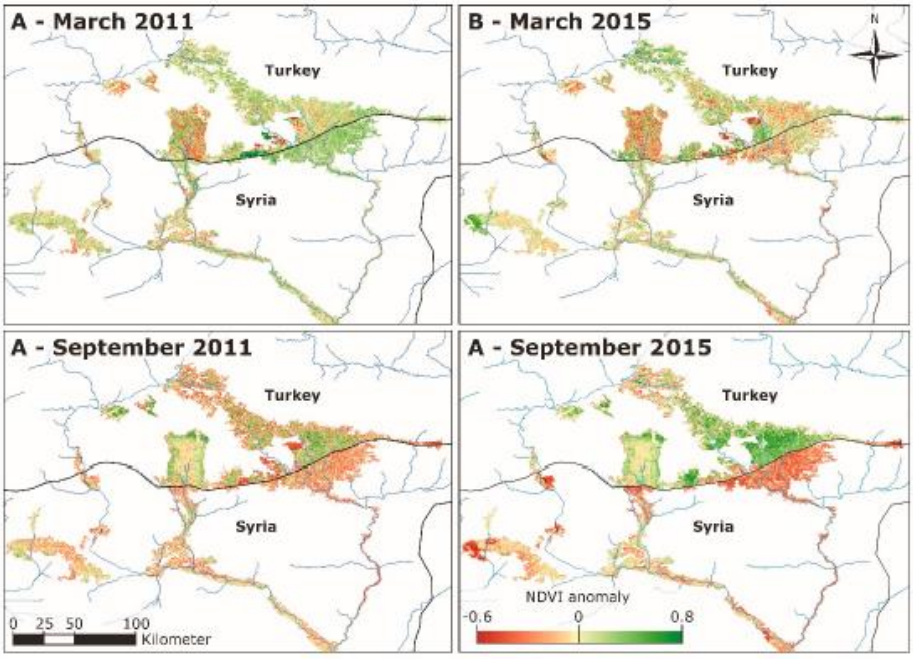

Figure 6 NDVI anomaly, data obtained from MODIS spaceborne system. Source: Karnieli, et al., 2019, p. 7.

The areas shown in figure 6 above are being supplied by irrigation water derived from the Euphrates, which is stored in two main reservoirs. One of these reservoirs being the Ataturk Lake in Turkey, and the other the Assad Lake in Syria. In figure 7 below, a sharp increase in water volume can be observed in the Ataturk Lake reservoir in Turkey, while at the same time a decrease in water volume is measured in the Assad Lake in Syria, both in 2010. After 2013, the water level continues to decrease in the Assad Lake, whereas it fluctuates in the Ataturk Lake during the same period (Karnieli, et al., 2019).

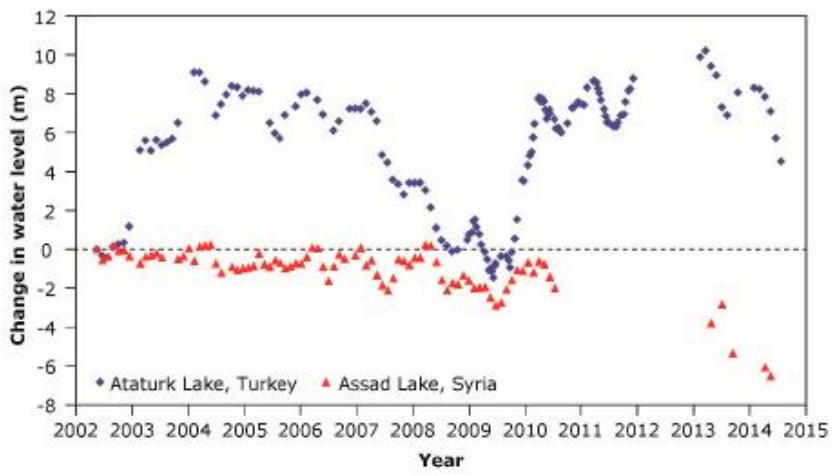

Figure 7 Water levels in the Ataturk Lake in Turkey and the Assad Lake in Syria, measured from 2002 until 2015. Water levels are overall stable until 2010, except for the dip observed in the Ataturk Lake from 2008 until 2010. Data obtained from several space missions, found here https://dahiti.dgfi.tum.de/en/. Source: Karnieli, et al., 2019, p. 7.

Due to the decreased water flow from the Euphrates, Syrian farmers were forced to rely more heavily on groundwater wells, depleting the groundwater reservoirs. As the decreased water flow in the Euphrates tributaries continues, Syrian farmers have to rely increasingly on illegally drilled water wells, which are poorly maintained (Karnieli, et al., 2019). Data derived from the Gravity Recovery and Climate Experiment (GRACE) satellites have shown a decrease in natural aquifers in the northern districts in Syria between January 2007 and December 2009, compared to January 2003 and December 2006 (Karnieli, et al., 2019). This decrease was observed in parts of the Euphrates-Tigris basin, if dependence on these aquifers continues, then the water levels in these aquifers would take significantly longer than usual (Karnieli, et al., 2019).

Another factor pointing to the decreased water flow in the Euphrates, is that a significant decrease in irrigated crop yield in Syria can be observed, which corresponds to the data listed earlier. The crop in question is cotton, which is heavily reliant on irrigation due to it being a summer crop. In figure 8 listed below, a significant drop in the Syrian cotton yield can be noted since 2011, with an all-time low measured in 2016. With cotton yields significantly lower, in combination with cotton being heavily reliant on irrigation, it is safe to assume this lower yield was caused by lower amounts of water flow in the Euphrates (Karnieli, et al., 2019). The lower water levels can be explained by Turkey diverting water from the Euphrates to the Ataturk Lake, failing to meet the minimum agreed upon water flow into Syria. The significantly lower yields in both winter and summer crops for Syrian farmers, led to these respective farmers to abandon their farms and move to the urbanized areas starting in 2010 (Karnieli, et al., 2019).

Several studies have shown the connection between water scarcity, failing crops and migration from rural to urban areas (Climate Diplomacy, n.d.b; Quinn & Roche, 2015). Additionally, authors such as Gleick (2014) and De Chatel (2014), have also noted the connection between water

scarcity and crop failure, and migration from rural areas towards urban areas, mainly combined with other factors.

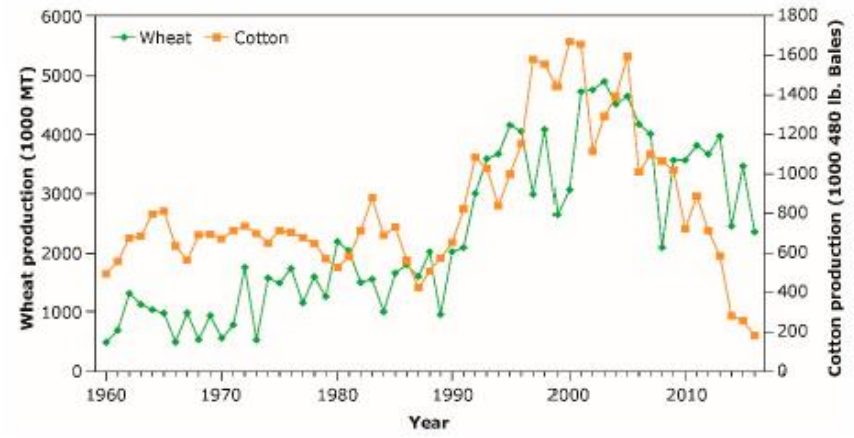

Figure 8 The production of Syrian wheat in the winter and Syrian cotton in the summer measured from 1960 until 2016. Source: Karnieli, et al., 2019, p. 9.

4.2.2 Turkey weaponizing water in the Syrian Civil War

Shortly prior to the Syrian Civil War Turkey and Syria were moving more towards cooperation regarding freshwater distribution, resulting in the 'Friendship dam' in the Orontes basin. However, when it became clear that the Syrian government was using lethal force against peaceful protesters, relations between Syria and Turkey stopped improving. Turkey became especially vocal around September 2014, due to almost 850.000 Syrian refugees coming to Turkey. This pressure on Turkey caused high Turkish officials to state that the downfall of Bashar Al-Assad would be inevitable and that it must not go on for too long (Dohrmann & Hatem, 2014). This is a significant shift in tone compared to previous years, where Turkey stated that it wanted to resolve the matter in Syria in a peaceful manner (Dohrmann & Hatem, 2014).

In May of 2014, Turkey gradually reduced the water flow in the Euphrates for 6 days, which was completely stopped by mid-June 2014 (Dohrmann & Hatem, 2014). This water flow reduction resulted in a 1.6 billion cubic meter decrease in freshwater in the Assad Lake in Syria, leading to the nearby hydropower stations to drastically reduce their output (Dohrmann & Hatem, 2014).

The Turkish MFA released a statement in July 2014 regarding the allegations that Turkey had deliberately cut off or reduced the water flow in the Euphrates to Syria (Ministry of Foreign Affairs Republic of Turkey, 2014). The Turkish MFA explicitly stated that it has never reduced the amount of released water from their transboundary rivers for political or other purposes in its history, which Turkey claims to not have deviated from in 2014. Turkey claims that it only approaches water issues from a humanitarian perspective (Ministry of Foreign Affairs Republic of Turkey, 2014).

Instead, the Turkish government wants to highlight that their people have to deal with severe droughts, with climate change playing a prominent role in the cause for the drought. Turkey states that despite the drought, an average of 599 cubic meters per second of water has been released from the Euphrates to Syria and Iraq. However, due to severe drought, Turkey claims it can

be expected that the water flow can be slightly reduced. According to Turkey, the main cause for the droughts in Syria and Iraq are the mismanagement of freshwater supplies and the conflict between several groups trying to gain control over these water resources (Ministry of Foreign Affairs Republic of Turkey, 2014).

In 2015, the Syrian minister of Water Resources talked to his Iraqi counterpart about Turkey having decreased the water flow into their respective countries (SANA, 2015a). According to the Syrian minister, the water flow into Jarabulus located in north east Syria along the Turkish border, received only 40 per cent of the agreed upon water volume of 330 cubic meters per second in the past 6 months (SANA, 2015a). Furthermore, Syrian and Iraqi officials have accused Turkey of backing neo-Ottoman terrorist groups in order to gain further control over water resources. These officials state that Syria and Iraq have a legal and natural right to the waters of the Euphrates, and that Turkey has no right to deny them access to the Euphrates' water resources in any manner (SANA, 2015b).

Since the withdrawal of US troops in north east Syria under the Trump administration, Turkey has benefitted from this power vacuum and has taken control of north east Syria, where mostly Kurds reside (Maat for Peace, 2020). Turkish troops took control of the Allouk water station in October 2019, which provides water supplies to around 460.000 people living in the Hasakah governorate, including various camps and Al-Hasakah city (Maat for Peace, 2020: ANHA, 2021; VOA, 2021). Since the beginning of 2020 the Turkish authorities in the area have cut off the water supply from Allouk station, until at least the end of March 2020 (Maat for Peace, 2020). The water was cut off to areas under Syrian Kurdish control, but also hit the vulnerable people in refugee camps, which have to deal with water shortages in light of the Covid-19 pandemic (Maat for Peace, 2020).

Turkey has been weaponizing water to aid themselves in their conflict with Kurdish forces in Syria. This weaponization has been going on for several years, by placing dams on the banks of the Euphrates and Tigris rivers (Maat for Peace, 2020). In February 2018, Turkey launched their 'Euphrates Shield' operation, during which Turkish forces bombed public facilities and damaged the water pump which the city of Afrin depends on (Maat for Peace, 2020).

Furthermore, Turkish forces targeted water transport lines from the Allouk water station to Al-Hasakah city, all done in the context of the Syrian Civil War (Maat for Peace, 2020). Additionally, Turkish backed forces have also been cutting off water in Al-Hasakah city in order to gain an edge over the SDF located in the city (Maat for Peace, 2020).

In August of 2020, the Syrian ambassador Al-Jafaari called upon the UN to intervene in order to stop Turkish forces from cutting off water to Al-Hasakah city (SANA, 2020). According to ambassador Al-Jafaari, Turkish forces have repeatedly cut off water from Allouk station and its connected wells, in order to punish the people of Al-Hasakah for supporting the Syrian regime and rejecting Turkish occupation (SANA, 2020).

Ambassador Al-Jafaari addressed the UN Security Council directly and has accused Turkey of acts of aggression, by occupying parts of northern Syria and weaponizing water against civilians (UN, 2020). The Syrian ambassador says that the occupied areas are being submitted to 'Turkification', and claims Turkish currency is being imposed and streets are renamed (UN, 2020). The ambassador accuses the UN Security Council of deliberately looking away, and Turkey of using its NATO membership to antagonize their neighbors, leading to ''escalation of unprecedented levels'' (UN, 2020).

Several NGOs, such as Human Rights Watch, have expressed their concerns of using water as a weapon of war, especially during the Covid-19 pandemic (DW, 2021). Since Turkish forces took control over the Allouk water station in October 2019, under 'Operation Peace Spring', electricity and water has been severely reduced (DW, 2021). The goal of this operation was to create a 30-kilometer wide 'safe-zone' within Syria under Turkish control (DW, 2021).

Syria has accused Turkey of having an interest in destabilizing the area for political reasons concerning the Kurds by weaponizing water. However, Turkey denies any involvement and claims the water shortage is caused by technical issues, due to Allouk station not receiving electricity from a dam outside of Turkish control (DW, 2021). Domestically, Turkey has openly stated its intentions in Turkish media of destroying the current administrations in northern Syria by using various means to accomplish that goal (DW, 2021). As of April 2021, incidents regarding cut off water supply from the Allouk water station have still been reported (OCHA, 2021). Between November 2019 and April 2021, a total of 23 incidents regarding disruption of the Allouk water station activities have been reported by various parties (OCHA, 2021).

May 2021, the Syrian minister of water resources visited Deir Ezzor, located in eastern Syria, to inspect the water stations which provide irrigation and drinking water (SANA, 2021). The minister stated that drainage from the Euphrates has been declining, but measures were taken by local authorities to create canals and river beds to make sure the water flow would return (SANA, 2021). The Syrian minister pointed to Turkey for not adhering to releasing the just amount due for Syria and Iraq, and urged international actors to intervene in order to secure the Euphrates water flow (SANA, 2021). This decline in water is threatening Raqqa, Deir Ezzor and Hasakah (SANA, 2021).

Turkey released an official statement addressing the accusations of Turkish forces causing water and power cuts from Allouk station. Turkey clarified that a previous statement by Resident Coordinator and Humanitarian Coordinator for Syria, Regional Humanitarian Coordinator for the Syria Crisis and UNICEF Regional Director for the MENA on July 15 2021, contains factual inaccuracies, incomplete and misleading information (Ministry of Foreign Affairs Republic of Turkey, 2021). The Turkish MFA states that the Allouk water station is under control of Syrian opposition groups, which is dependent on a power station located south of Allouk station under PKK/PYD control, depriving the Allouk water station of electricity and rendering it inoperable (Ministry of Foreign Affairs Republic of Turkey, 2021). According to Turkey, this is the reason why since April 18 2021 towns such as Tal Abyad and Ras al-Ain, and since June 26 2021 Allouk water station, have had no electricity. Turkey in turn accuses UN representatives of having a selective approach regarding humanitarian issues in Syria, and requests these representatives to act in a neutral, impartial and independent manner (Ministry of Foreign Affairs Republic of Turkey, 2021).

4.3 Syria using water as pressure tool

In the previous section, a timeline of conflicts between Syria and Turkey over the water resources in the Euphrates-Tigris basins have been presented. Next to the Euphrates-Tigris basins, the Orontes basin is also one of the most conflict inducing basins between Syria and Turkey.

In the previous paragraph several conflicts between Syria and Turkey have been stated, mainly regarding the Euphrates-Tigris basin. As Turkey is geographically higher vis-à-vis Syria and Iraq, and the source of the Euphrates and Tigris rivers, it puts Turkey in a position of power towards the downstream riparians. Turkey has first access to the freshwater resources of these respective rivers, and the downstream riparians have to wait until the water reaches their soil. However, next to the Euphrates and Tigris, there is another important basin called the Orontes, in which Syria has an

elevated position over Turkey. This provides an opportunity to observe how Syria is using its geographical advantage to pressure Turkey.

The Orontes River starts in north east Lebanon and flows after 46 kilometers into Syria. The Orontes acts partially as an international border between Lebanon and Syria, after which it flows into the Alexandretta region in Turkey, and ending in the Mediterranean Sea in the west (Conker & Hussein, 2020). The region of Alexandretta is at the heart of the conflict of the Orontes between Turkey and Syria. Alexandretta or also known as Hatay or Iskenderun is a disputed area (Conker & Hussein, 2020). The Orontes is an important river to Syria, as it supplies vital water resources for its agriculture, drinking needs, and most importantly to its industry which is largely located in eastern Syria (Conker & Hussein, 2020).

While the Orontes springs in Lebanon, and continues its flow into downstream Syria and Turkey, Syria acts as the '*hydro-hegemon*' while being a midstream riparian (Conker & Hussein, 2020). This has to do with the fact that around 72 per cent of the Orontes River flows through Syria, leaving Lebanon and Turkey significantly smaller parts to exploit (Conker & Hussein, 2020). Furthermore, Syria used its political influence in Lebanon, which was backed by military forces, to create a favorable context regarding the Orontes in Lebanon (Conker & Hussein, 2020). Additionally, Syria has made sure to exclude downstream Turkey from the bargaining table concerning issues in the Orontes, exerting power on the downstream riparian (Conker & Hussein, 2020).

Turkey has made several attempts to bring the issue of the Orontes to the bargaining table in 1965 and 1993 during bilateral talks (Conker & Hussein, 2020). However, Syria refused to deal with the Orontes issue several times, leading to Syria excluding Turkey as a riparian partner in the 1994 treaty with Lebanon on the Orontes (Conker & Hussein, 2020). This exclusion by Syria has made relations between Turkey and Syria tense.

The Orontes basin contains multiple tributaries with a transboundary characteristic, such as the Afrin River, which springs in Turkey, then flows into Syria and returns back to Turkey (Conker & Hussein, 2020). Turkey has tried to build dams in their own tributaries feeding into the Orontes basin, in order to be less dependent on Syria in the respective basin (Conker & Hussein, 2020). However, as most of the Orontes water resources go through Syria first, Turkey has to deal with decreased water quality in the Orontes basin due to exploitation of Syria (Conker & Hussein, 2020). Additionally, Turkey's most pressing issue in the Orontes basin is dealing with flooding. For this reason, Turkey wanted to build the Friendship Dam in the Orontes to deal with this problem, along with the symbolic value this project has in their relation with Syria (Conker & Hussein, 2020). Syria is actively using its elevated position in the Orontes basin to exert pressure on Turkey, as they lack this power in the Euphrates-Tigris basins, where Syria is the downstream riparian (Conker & Hussein, 2020).

Syria was able to create a favorable position for itself, due to the Lebanese Civil War from 1975 until 1990, as Syria was asked to provide military support in Lebanon (Conker & Hussein, 2020). After the Civil War was over, Syria still had stationed troops in Lebanon until 2005, after being pressured by the international community (Conker & Hussein, 2020). In the years leading up to the Syrian Civil War, Syrian influence in Lebanon has been waning, due to Lebanon making use of issue-linkage. Specifically, Lebanon stated that by getting a good deal with Syria on water distribution, it would have a better position in negotiations with Israel. Good relations between Lebanon and Israel would also be beneficial for Syria (Conker & Hussein, 2020).

Concerning the Orontes basin, issue linkage is at the core of the problem of non-agreement between Syria and Turkey. Syria views the Alexandretta region, through which the Orontes flows into the Mediterranean Sea, as a region that should have belonged to them (Conker & Hussein, 2020). Syria is dissatisfied with the post-WW1 order and feels betrayed by the western powers for giving away the Alexandretta region to Turkey. Syria had envisioned a 'Greater Syria' in which also Lebanon, Jordan, and Palestine would be a part of (Conker & Hussein, 2020). For this reason, Syria does not view the Orontes as a transboundary river and the Syrian government is actively avoiding mentioning Turkey when it comes to the Orontes, as part of the Syrian strategy of exclusion (Conker & Hussein, 2020).

Next to the territorial dispute between Syria and Turkey regarding the Alexandretta region, there are other historical reasons which fed the distrust between Turkey and Syria. First, the period of Ottoman rule in Syria is looked down upon regarding Arab nationalism and historiography (Conker & Hussein, 2020). Second, Cold War ideological differences made sure the two countries would be on opposite sites, making reconciliation difficult (Conker & Hussein, 2020). This issue is also present in freshwater conflicts in the Euphrates-Tigris basins. Third, the conflicts over the Euphrates-Tigris basins were nearing actual armed conflict when Syria decided to support armed groups in order to undermine the GAP in the Euphrates-Tigris basins (Conker & Hussein, 2020). This situation was further worsened by the Syrian support to the PKK at the end of the 1990s (Conker & Hussein, 2020).

Since the beginning of the 2000s relations between Turkey and Syria were improving, resulting in several MoUs on freshwater distribution between the two countries. The US invasion of Iraq in the early 2000s was the catalyst for Syria to look for allies in order to shield themselves better from the US, Turkey fulfilled that role (Conker & Hussein, 2020). Additionally, Turkey and Syria had a shared interest in Iraq. Syria had to choose between supporting the PKK or Turkey, and chose Turkey, losing the PKK leverage on Turkey (Conker & Hussein, 2020).

These improved relations eventually led to the plans of the Friendship Dam between Syria and Turkey in the international river border of the Orontes between the two countries. The inauguration of this dam was in 2011, only one month before the outbreak of the Syrian Civil War. Since the civil war in Syria, relations have worsened, especially since Syria downed one of Turkey's jet fighters (Conker & Hussein, 2020). As a result, all diplomatic cooperation has ceased, including cooperation on freshwater distribution. This means that the construction on the Friendship Dam in the Orontes had come to a stop (Conker & Hussein, 2020). Moreover, the claim that the Alexandretta region belongs rightfully to Syria had returned on the political agenda, after being absent between the 2000s and the start of the Syrian Civil War (Conker & Hussein, 2020).

Conflicts over the Orontes freshwater supplies have been mainly between Turkey and Syria, where Turkey's main concerns have been that the Orontes does not provide enough freshwater resources to meet the agricultural needs of both Syria and Turkey (Kibaroglu & Sumer, 2015). Syria has been primarily focusing on the Alexandretta/Hatay region and using this to deny Turkey from discussing the Orontes issue (Kibaroglu & Sumer, 2015). On top of that, Syria's other main interest is that the Orontes headwaters do not fall into the hands of Israel (Kibaroglu & Sumer, 2015).

The Orontes basin area in Syria has been hit hard by the Syrian Civil War, where pro-opposition groups and Syrian government troops have been targeting freshwater infrastructure to gain an edge over the other group in the civil war (Kibaroglu & Sumer, 2015). Since the outbreak of the Syrian Civil War in 2011 the diplomatic relations between the Turkish and Syrian governments on transboundary freshwater distribution have completely stopped, threatening the plans for the Friendship dam in the Orontes (Kibaroglu & Sumer, 2015; Shamout, 2015). Without the

implementation of the Friendship dam, there will be no official recognition of Alexandretta as a Turkish region. Furthermore, the Orontes River will remain heavily exploited by all riparians, which will have an impact on the water quality in Turkey and the threat of future floods remain as well (Shamout, 2015).

5. Issue linkage & causal mechanisms

Euphrates-Tigris Basins

Looking at the historic disputes between Turkey and Syria it is difficult to point towards one specific mechanism underlying the animosity between Turkey and Syria, due to different issues being linked to freshwater issues. However, based on the data so far, several recurring factors can be observed causing conflict between Turkey and Syria.

First, one of the reasons for mistrust between Turkey and Syria is that they both depend on the same freshwater sources in order to suit their national needs. In order to come to a solution, several agreements were made in the period from the 1920s to the 1950s, but mainly on a bilateral basis in which Syria was excluded. Furthermore, the first plans were taking shape in Turkey and Syria to further develop hydropower and agriculture, putting a further strain on the available freshwater. These unilateral needs would be greater than the available freshwater supplies, leading to the need for trilateral cooperation of the riparian countries. However, this trilateral cooperation faced some issues as time moved on.

Second, ideological differences played a role in deepening the polarization between Turkey and Syria during the Cold War. Turkey was and still is a NATO member, whereas Syria used to be an ally of the Soviet Union and to this day allies itself with Russia. Despite this ideological divide, some cooperation regarding freshwater distribution between Turkey and Syria was possible in the 1980s.

While Turkey is still a NATO member, Turkey has not been a consistent ally to NATO in the past, and is mostly interested in achieving its own foreign policy goals. This was evident in their dealings in matters involving Israel, which Turkey opposes. After the start of the Syrian Civil War, Turkey has been actively engaging in the affairs of its neighbors, especially in Syria. This was made clear when Turkey was supporting opposition groups in Syria to dispose of the Assad regime. During the Syrian Civil War, it became evident that Turkey was shifting towards a Neo-Ottoman *Realpolitik* (Manhoff, n.d.). Turkey had stated that it wanted to play a more prominent role in regional power politics (Manhoff, n.d.).

Turkey became even more estranged with the other NATO members when they wanted to continue with their arms supply to Syrian opposition groups in 2013, even though radical Islamism was becoming more prominent among these groups (Manhoff, n.d.). In 2014, when IS became a threat, the US needed Kurdish support to halt IS advances in Syria. This support also put a strain on the relation between Turkey and NATO, as Turkey views these Kurdish fighters as terrorists. Additionally, Turkey has been cooperating more closely with Russia in securing northern Syria. However, this relation was very rocky in the beginning, as Turkey had downed a Russian fighter in 2015 (Manhoff, n.d.). What can be concluded from these interactions is that Turkey does not strictly adhere to its alliances according to ideological origins. Turkey mainly operates in its own interests and works on a pragmatic basis.

Third, there is the matter of the Kurds which has been a significant point of contention between Turkey and Syria, especially in the 1990s and during the Syrian Civil War. Water was cut off to Syria by Turkey, pressuring Syria to withdraw their support for the PKK in the 1990s. This trend has continued and is still going on in 2021, as Turkey has been cutting off water flow into Kurdish held areas. Syria has condemned these actions as a war crime and sees Turkish forces on Syrian soil as a breach of their sovereignty.

Turkey is also known to use freshwater to its advantage by using it to improve foreign relations and generate income. Examples of this use can be observed in the proposed Peace Pipeline and the *Manavgat River Project*, focused on trading water with Mediterranean and Middle Eastern neighbors (Akanda, et al., 2007). So, what can be observed thus far is that freshwater scarcity, which means that these resources are limited, has caused initial distrust between Turkey and Syria. This is because Syria knows that its economic development is dependent on freshwater resources over which Turkey has much control. Then, as time moved on, several non-water policy issues are linked to these scarce freshwater resources, mainly by Turkey as they are mostly the upstream riparian, which are used to pressure Syria.

Fourth, there is the disagreement between Turkey, Syria and Iraq about the terminology which should be applied to the Euphrates and Tigris rivers. Syria and Iraq claim to have historic rights over the water resources in the Euphrates and Tigris rivers, but Turkey stands firm in stating that they have every right to do with the water resources within their own borders. This means that Turkey denies the downstream riparian countries formal co-sovereignty over these resources. Turkey views the Euphrates and Tigris rivers as transboundary rivers, as opposed to international rivers, which means that according to Turkey the downstream riparian countries can only claim equitable amounts of these respective water resources.

Orontes Basin

In the other significant basin, the Orontes, there are also several factors at play which are linked to water scarcity and conflict between Syria and Turkey.

First, Syria is pressing its advantage in the Orontes River basin to compensate for its unfavorable geographical position in the Euphrates-Tigris basins. Both Syria and Turkey rely on the Orontes water resources for their agriculture and industry, but their combined demands exceed the supply. As Syria is a midstream riparian in the Orontes basin, Syria can heavily exploit the water resources before it enters Turkey.

Second, the water issues are linked to territorial issues as the Orontes River flows through a contested area in modern Turkey. The contested area is the Alexandretta/Hatay area in south east Turkey, which Syria claims as their own, as it was given to Turkey post WW1.

Third, ideological differences have played a role in the conflict between Syria and Turkey in the Orontes basin. First, there is the Ottoman legacy when the Ottoman empire was in charge of the Levant. Second, Cold War ideologies exacerbated this animosity further, just as they did regarding the issues in the Euphrates-Tigris basins.

Fourth, Turkey is concerned about the water quality flowing into their borders from the Orontes River, which is dropping due to exploitation of the Syrian industry. Additionally, Turkey is concerned of flooding and droughts which occur when the flow of water is not properly controlled in the Orontes basin. For this reason, Turkey wants to build the Friendship dam, on top of the symbolic

power it has. Building this dam would mean that Syria would acknowledge Turkey's stake in the Orontes basin, and can no longer ignore Turkey's requests concerning the Orontes basin.

The above-mentioned mechanisms in the Euphrates-Tigris, and Orontes basins can explain how the unstable foreign relations between Turkey and Syria have led to induced freshwater scarcity by Turkey in Syria. However, previous research by Barnes (2009), Gleick (2014, and De Chatel (2014), state that mismanagement by the Syrian government has also played a significant role in the perceived freshwater scarcity in Syria. The Syrian government made inefficient use of their freshwater for industrial crops, and patronage within government circles made sure freshwater resources were unfairly distributed. The mismanagement combined with failed economic liberalization, and in part periods of drought caused by climate change, have provided the fertile soil from which the uprisings that led to the Syrian Civil War could grow.

Exacerbating the Syrian Civil War

Turkish-Syrian relations on freshwater distribution were steadily improving in the period from 2000 until 2011 before the Syrian Civil War. Since the start of Syrian government repression of protests in Syrian cities, the cooperation between Syrian and Turkish government bodies on freshwater ceased. At first, Turkey was advocating for a peaceful resolution of the violent conflict for the first few years. This rhetoric changed in 2014, when highly placed Turkish government officials began to denounce the Syrian Al-Assad regime and called for its fall, as a result of dealing with the immense influx of Syrian refugees.

In 2014, Turkey was filling their reservoir of one of their dams in the Euphrates basin, which led to severely decreased flow of water into Syria, cutting the water supply off for several days. Turkey filling up the reservoirs for their dams is a result of Turkey pursuing their ambitious hydropower goals and their solution to droughts and floods.

Despite the official statement of the Turkish government that they only view water as an issue of humanitarian nature, and that the Turkish government would never weaponize water for political or other ends, Turkey has targeted water infrastructure in Syria. During several military offensives in northern Syria, water infrastructure has been targeted in order to deprive Kurdish held areas of water and electricity. Turkish troops and Turkish backed troops remain in control of several water- and electricity stations, used to gain an edge on Kurdish forces, which are viewed as terrorists by the Turkish government.

While various NGOs and Syrian officials and media sources have confirmed that Turkish forces are in charge of the stations which regulate the flow of water and electricity, the Turkish government denies actively cutting off these resources. Instead, Turkish officials claim that the decreases in water flow and electricity are the result of technical issues, or the involvement of armed opposition groups. The Syrian government has responded to this by saying that Turkey is violating Syrian sovereignty and that Turkey is guilty of war crimes by weaponizing water.

5.1 Causal mechanism parts

Based on the analysis of the data, combined with parts from previous research, the following parts can give an overview of the current understanding of the causal mechanisms behind freshwater scarcity in the Levant, in relation to triggering and exacerbating the Syrian Civil War.

Freshwater scarcity in the Levant cannot be detached from the goals of Syria and Turkey regarding the development of their agriculture and hydropower. As scarcity of resources does not occur if there is not any need for these resources. These agricultural and hydropower goals along with historical factors are pivotal in understanding why Turkey would cut off the water flow into Syria in the first place, as it is multi-faceted. What makes it more complex is that there is a conflict between Syria and Turkey over the Euphrates-Tigris basins on the one hand where Turkey has a geographical advantage, and on the other hand there is a conflict between Syria and Turkey over the Orontes basin where Syria has a geographical advantage.

Euphrates-Tigris basins:

Cause: limited freshwater resources (freshwater scarcity) in the Levant

1. Mutual dependence over freshwater resources for agriculture and hydropower by Syria and Turkey causes distrust between the two countries as each country was acting in self-interest
2. No international agreements between all riparian countries on freshwater use from the Euphrates-Tigris basins
3. Ambitious goals by Syria and Turkey to be self-reliant exceeding available freshwater supplies in the Euphrates-Tigris basins
4. Issue-linkage & power politics
    a. A history of Turkey and Syria being excluded by each other from the negotiating table on freshwater issues made cooperation between Turkey and Syria on these issues difficult
    b. Cold War ideological division, with Turkey as a NATO member and Syria as an ally of the Soviet Union
    c. Syrian past support for the Kurds and Turkey viewing Kurds as a threat to their sovereignty
    d. Turkey as an upstream riparian feels that it should have complete sovereignty over the freshwater resources within their borders before they flow into the downstream riparians.
        i. Turkey disagrees with downstream riparian countries on how the Euphrates and Tigris should be classified in terms of terminology and what rights are attached to these terms
5. Turkey fills several reservoirs in the Euphrates-Tigris basins within their own borders in pursuit of their own agricultural and energy goals, causing decreased water flow into the downstream riparian countries.
    a. This is in violation of previously agreed upon minimum amounts of water flow, but Turkey views that it can do with its water resources within its borders as they see fit.
6. Period of drought from 2006 until 2010 in Syria
7. Syrian freshwater mismanagement by government corruption, and inefficient use of water resources exacerbated freshwater scarcity
8. Decreased water flow in Euphrates resulted in failed crops in northern Syria
9. Crop failure led to farmers losing their livelihood and forced them to move to urban areas in Syria
10. Failed economic policies, and patronage within government circles combined with crop failure led to civil unrest in Syrian cities
11. Violent government repression of protests

Outcome: Syrian Civil War

The mechanisms in the Euphrates-Tigris basins are the most important mechanisms in explaining how these led to water cut off by Turkey in Syria, and how this in combination with other previously researched mechanisms have led to the triggering of the Syrian Civil War. However, the Orontes basin has also played a significant role in shaping the unstable relations between Syria and Turkey leading up to the Syrian Civil War in 2011. These mechanisms can be linked to the first four mechanisms described in the section earlier on the Euphrates-Tigris basin mechanisms. The mechanisms present in the Orontes basin are the following, listed below.

Orontes basin:

1. limited freshwater resources does not meet demands from both Syria and Turkey simultaneously
2. Power politics & issue-linkage:
    a. Syria in mid-stream position, Turkey in down-stream position
    b. Syria denies Turkey in negotiation process due to Syria having a geographical advantage which Syria lacks in the Euphrates-Tigris basins
3. Issue linkage
    a. Syria dissatisfied with post-WW1 order:
        i. Syria does not recognize Alexandretta area as Turkish region
        ii. Syria views Ottoman rule with disdain, due to incompatibility with Arabian values
    b. Cold War ideologies with Turkey as NATO member and Syria as Soviet Union ally
    c. Euphrates-Tigris conflict
        i. Turkey claims Syria has enough water as it has access to the Euphrates and Tigris.
        ii. Syria wants to make up for its downstream position in the Euphrates-Tigris basins and use their upstream position over Turkey in Orontes issues
4. Conflicting interests of Syria and Turkey in Orontes basin:
    a. Syria relies on water resources for mostly industry and partly agriculture.
    b. Turkey is mainly concerned about water quality and increased chance of severe flooding due to non-cooperation

The steps laid out above give a step-by-step explanation of how freshwater scarcity has played a role in triggering the Syrian Civil War. However, also since the start of the Syrian Civil War, freshwater has been weaponized by Turkey. This weaponization of water has further exacerbated foreign relations between Turkey and Syria, and the Syrian Civil War. These relevant mechanisms which have exacerbated the Syrian Civil War are as follows:

1. As soon as government repression began, the Turkish-Syrian negotiations on freshwater distribution were suspended
    a. Cancellation of Orontes Friendship dam
2. Turkey began to publicly oppose the Al-Assad regime since 2014, with multiple highly placed officials stating that it is only a matter of time before president Al-Assad would fall
3. In 2014, Turkey began decreasing the flow of water in the Euphrates to fill their reservoirs. Turkey would cut off the flow of water several times in the coming years until 2021
4. From 2018 until late 2019, Turkey has launched several armed offensives in northern Syria, during which several water and power stations have been captured
5. Turkey blames severe drought due to the climate, technical issues in the water stations, and control of opposition groups of infrastructure in Syria for the decreased flow of water in north and north-east Syria

6. Conclusion

What can be concluded is that the long history between Syria and Turkey has had an impact on their mutual relationship regarding freshwater distribution in various basins which are shared between the two countries. In order to draw the conclusions of the earlier provided findings, it is useful to go back to the main research question this thesis aimed to answer:

How has freshwater policy by Syria and Turkey, in relation to each other, affected the Syrian Civil War?

This thesis has aimed to show that historical context has played a major role in shaping the turbulent relations between Turkey and Syria regarding freshwater distribution. The freshwater resources provided by the Euphrates and Tigris rivers proved insufficient in meeting the increasing needs by Turkey and Syria in developing their respective agriculture and hydropower plants. Under certain circumstances freshwater availability has almost led to armed conflict in the past between the riparian countries of the Euphrates and Tigris. This means that an armed conflict in the future is a real possibility. This might be especially true as human-induced climate change seems to increasingly leave its mark in the near future.

Turkey's stance has always been that they should have complete sovereignty over their domestic resources, even if these resources cross the border. The downstream riparian countries always claimed to have a historical claim to these water resources. Both Turkey and Syria rely on the water resources provided by the rivers flowing within their countries to develop their agricultural and electricity output. These demands exceeded the available supply from the Euphrates, Tigris, and Orontes, making bilateral agreements on the use of these water resources necessary.

In the period before the Syrian Civil War, it was clear that water has been used as a tool of war, especially by Turkey, as they are the upstream riparian in the Euphrates and Tigris basins. Turkey has in pursuit of their own development ambitions cut off water to Syria several times, triggering civil unrest in Syria. During the Syrian Civil War, Syria has weaponized water several times and used it to put pressure on the Kurds in northeast Syria.

Syria, which is heavily dependent on their freshwater resources, has tried to use the water resources in the Orontes basin as a means to pressure Turkey. Syria is in an advantageous position in this basin, being the mid-stream riparian, while Turkey is the downstream riparian. Syria has denied Turkey from discussing the Orontes issue, as Syria does not want Turkey to jeopardize their available water resources in the Orontes basin, needed to run Syrian industry.

However, it is important to note that freshwater scarcity is not the only issue at play in the conflicts between Turkey and Syria. The conflicts between Turkey and Syria in the Euphrates, Tigris, and Orontes basins are all subject to issue-linkage and power politics. This means that water issues are getting mixed up with non-water issues and makes it hard to make any notable progress on reconciliation on water issues between Turkey and Syria. With the Syrian Civil War making sure that all reconciliation is halted, Turkey and Syria fall back into their old behavior of mutual distrust towards each other. It would therefore be best for an outside party to try and get all involved riparians countries together to form an agreement on fair freshwater distribution. However, Turkey has indicated that it firmly opposes any third-party mediation. For this reason, it might be best to

wait for a future opportunity when the Syrian Civil War is in a more ripened state in order to bring about reconciliation and negotiation.

6.1 Discussion

The decision to use process-tracing in this research was taken due to the complex nature of the Syrian Civil War case in relation to water. By carefully examining each step in a historic overview, the role which freshwater plays in the Syrian Civil War would be easier to understand. However, one of the drawbacks of the process-tracing method, especially in the explaining-outcome process-tracing, is that there are no clearly defined manuals to work with. This thesis has tried to overcome this drawback by using previous literature as a starting point.

Another pitfall of the process-tracing method is that researchers which make use of this method tend to overanalyze the causal mechanisms by explaining even trivial causal relations. In this research I have tried to stick as much as possible to the causal relations between freshwater scarcity and the Syrian Civil War. However, as has become clear in the analysis of this thesis, it has been impossible to detach non-water issues from the water issues in relation to the Syrian Civil War. Which means that other causal paths had to be dissected. As the Syrian Civil War and the role freshwater plays within it is a complex case and is still ongoing, it is possible that some causal relations have not been charted thus far.

Additionally, process-tracing requires observations which describe the processes underlying the variables which are already known. Therefore, it would be best if the data collection would be done in the field. For example, data derived from interviews would provide a better opportunity to get a look behind several decision-making processes in policy, as it is possible to ask further questions of the respondents. This thesis however does not have access to primary sources, but relies on secondary sources. The Syrian Civil War makes it difficult to travel to Syria and come into contact with government officials, in addition to the Covid-19 pandemic and its travel restrictions. Future research which is making use of process-tracing in this case would benefit from the use of data derived from interviews, which can give a more detailed description of the decision-making processes on freshwater policy.

Because process-tracing is about making within-case inferences, this thesis will only have limited applicability to other similar cases. The goal of process-tracing is not to create grand theories, but is meant for middle-range theory building and testing. Still, some elements from this case study can be used as a starting point for future research in similar cases.

References

Akanda, A., Freeman, S., & Placht, M. (2007). The Tigris-Euphrates River Basin: Mediating a Path Towards Regional Water Stability. *Al-Nakhlah, 31*, pp. 1-12.

ANHA Hawar News Agency. (2021). *War of Water is Turkish Weapon that Threatens Syria and Iraq.* Accessed June 22nd 2021, at http://www.hawarnews.com/en/haber/war-of-water-is-turkish-weapon-that-threatens-syria-and-iraq-h25105.html.

Barnes, J. (2009). Managing the Waters of Ba'ath Country: The Politics of Water Scarcity in Syria. *Geopolitics, 14*(3), pp. 510-530. DOI: 10.1080/14650040802694117

Beach, D., & Pedersen, R.B. (2013). *Process-Tracing Methods: Foundations and Guidelines.* Ann Arbor: University of Michigan Press.

Çarkoglu, A., & Eder, M. (2001). Domestic Concerns and the Water Conflict over the Euphrates-Tigris River Basin. *Middle Eastern Studies, 37*(1), pp. 41-71. DOI: 10.1080/714004364

Conker, A., & Hussein, H. (2020). Hydropolitics and issue-linkage along the Orontes River Basin: an analysis of the Lebanon–Syria and Syria–Turkey hydropolitical relations. *International Environmental Agreements: Politics, Law and Economics, 20*, pp. 103–121. DOI: 10.1007/s10784-019-09462-7

Climate Diplomacy. (n.d.a). *Turkey, Syria and Iraq: Conflict over the Euphrates-Tigris.* Accessed June 22nd 2021, at https://climate-diplomacy.org/case-studies/turkey-syria-and-iraq-conflict-over-euphrates-tigris.

Climate Diplomacy. (n.d.b). *Syrian Civil War: The Role of Climate Change*. Accessed June 22nd 2021, at https://climate-diplomacy.org/case-studies/syrian-civil-war-role-climate-change.

De Châtel, F. (2014) The Role of Drought and Climate Change in the Syrian Uprising: Untangling the Triggers of the Revolution. *Middle Eastern Studies, 50*(4), pp. 521-535. DOI: 10.1080/00263206.2013.850076

Dohrmann, M., & Hatem, R. (2014). The Impact of Hydro-Politics on the Relations of Turkey, Iraq, and Syria. *Middle East Journal, 68*(4), pp. 567-583. Accessible at, https://www.jstor.org/stable/43698183.

DW [Deutsche Welle]. (2021). *Syria: Are water supplies being weaponized by Turkey?* Accessed August 4, 2021, at https://p.dw.com/p/3oI6N.

Ellingsen, T. (2000). Colorful Community or Ethnic Witches' Brew? Multiethnicity and Domestic Conflict During and After the Cold War. *Journal of Conflict Resolution,* 44(*2*), p. 228-249.

European Communities. (2000). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for community action in the field of water policy, Official Journal of the European Communities, L327, 22.12.2000.

FAO. (2008). *AQUASTAT Country Profile – Syrian Arab Republic.* Food and Agriculture Organization of the United Nations (FAO). Rome: Italy.

Foreign Policy. (2019). Assad is Now Syria's Best-Case Scenario. Accessed December 9, 2019, at https://foreignpolicy.com/2019/10/17/assad-syria-turkey-kurds-leadership/.

Gleditsch, N.P. (2003). Environmental Conflict: Neomalthusians vs. Cornucopians. In: H.G. Brauch, P.H. Liotta, A. Marquina, P.F. Rogers, & M.E. Selim (Ed.). *Security and the Environment in the Mediterranean: Conceptualising Security and Environmental Conflicts.* (Pp. 477-485). Berlin: Springer Verlag.

Gleditsch, H.P. (2007). Environmental Change, Security, and Conflict. In: C.A. Crocker, F.A. Hampson, & P. Aall (Ed.). *Leashing the Dogs of War. Conflict Management in a Divided World.* (Pp. 177-196). Washington D.C.: United States Institute of Peace Press.

Gleditsch, N.P., Furlong, K., Hegre, H., Lacina, B., & Owen, T. (2006). Conflicts over Shared Rivers: Resource Scarcity or Fuzzy Boundaries? *Political Geography, (4)*, p. 361-382.

Gleditsch, N.P., & Hegre, H. (1997). Peace and Democracy: Three Levels of Analysis. *Journal of Conflict Resolution,* 41(*2*), p. 283-310.

Gleditsch, N.P., & Urdal, H. (2002). Ecoviolence? Links between Population Growth, Environmental Scarcity, and Violent Conflict in Thomas Homer-Dixon's Work. *Journal of International Affairs,* 56 (*1*), p. 283-203.

Gleick, P.H. (2000). *The World's Water 2000-2001: The Biennial Report on Freshwater Resources.* Washington D.C.: Island Press.

Gleick, P.H. (2014). Water, Drought, Climate Change, and Conflict in Syria. *American Meteorological Society, 6*, pp. 331-340. DOI: 10.1175/WCAS-D-13-00059.1
Hegre, H. (2000). Development and the Liberal Peace: What Does It Take to Be a Trading State? *Journal of Peace Research,* 27(*1*), p. 5-30.

Holsti, K. (1991). *Peace and War: Armed Conflicts and International Order 1648-1989.* Cambridge: Cambridge University Press.

Human Rights Watch. *Turkey/Syria: Weaponizing Water in Global Pandemic? COVID-19 Protections Rely on Adequate Supply.* Accessed August 3, 2021, at https://www.hrw.org/news/2020/03/31/turkey/syria-weaponizing-water-global-pandemic.

Kibaroglu, A. (2015). An analysis of Turkey's water diplomacy and its evolving position vis-à-vis international water law. *Water International*, *40*(1), pp. 153-167. DOI: 10.1080/02508060.2014.978971

Kibaroglu, A., & Scheumann, W. (2013). Evolution of transboundary politics in the euphrates-tigris river system: New perspectives and political challenges. *Global Governance, 19*(2)*,* pp. 279-306.

Kibaroglu, A., & Sumer, V. (2015). Turkey's foreign policy orientation in the water context and the Orontes Basin. In: R. Ballabio, F.G. Comair, M. Scalet & M. Scoullos (Ed.). Science diplomacy and transboundary water management – The Orontes River case (ed., pp. 57-87). Venice, Italy: Unesco.

Maat for Peace, Development and Human Rights. (2020). *Maat report to the UN Special Rapporteur on the human rights to safe drinking water and sanitation regarding Syria.* Accessed August 3, 2021 at
https://www.ohchr.org/_layouts/15/WopiFrame.aspx?sourcedoc=%2FDocuments%2FIssues%2FWater%2FProgressiverealization%2FMaat%5Ffor%5FPeace%2C%5FDevelopment%5Fand%5FHuman%5FRights%2Edocx&action=view.

Malthus, T.R. (1798, 1803, repr. 1992). *An Essay on the Principle of Population: Or a View of Its Past and Present Effects on Human Happiness: With an Inquiry into Our Prospects Respecting the Future Removal or Mitigation of the Evils which It Occasions.* Cambridge: Cambridge University Press.

MANHOFF, T. (n.d.). Turkey's Foreign Policy Towards Syria. Konrad Adenauer Stiftung.

Ministry of Foreign Affairs Republic of Turkey. (n.d.). *Turkey's Policy on Water Issues.* Accessed August 2, 2021, at https://www.mfa.gov.tr/turkey_s-policy-on-water-issues.en.mfa.

Ministry of Foreign Affairs Republic of Turkey. (2014). *No: 288, 4 July 2014, Press Release Regarding the Amount of Water That Turkey Releases From the Euphrates River.* Accessed August 2, 2021, at https://www.mfa.gov.tr/no_-228_-4-july-2014_-press-release-regarding-the-amount-of-water-that-turkey-releases-from-the-euphrates-river.en.mfa.

Ministry of Foreign Affairs Republic of Turkey. (2021). *QA-29, 16 July 2021, Statement of the Spokesperson of the Ministry of Foreign Affairs, Ambassador Tanju Bilgiç, in Response to a Question Regarding the Joint Statement Released on 15 July 2021 on Allouk Water Station.* Accessed August 2, 2021, at https://www.mfa.gov.tr/sc_-29_-allouk-su-istasyonu-konusunda-yapilan-15-temmuz-2021-tarihli-ortak-aciklama-hakkindaki--soruya-cevabi.en.mfa.

Mnory, M.N. (2017). Water Conflict Between Syria and Turkey. *Journal of Law, Policy and Globalization, 68*, pp. 108-111. Accessible at, https://pdfs.semanticscholar.org/ec14/a3295fd1c5d0c2dcf2ed8f858d29660ab202.pdf.

Northrup, S. [Washington Institute] (2017). *The Growing Power of Water in Syria.* Accessed, June 9, 2021, at https://www.washingtoninstitute.org/policy-analysis/growing-power-water-syria.

OCHA [United Nations Office for the Coordination of Humanitarian Affairs]. (2021). *Syria: Disruption to Alouk Water Station - Flash update #01 (As of 28 April 2021).* Accessed August 4, 2021, at https://reliefweb.int/report/syrian-arab-republic/syria-disruption-alouk-water-station-flash-update-01-28-april-2021.

Quinn, A., & Roche, J. (2015). *Syria's Climate Conflict - Was the catalyst for the current conflict in Syria a drought caused by anthropogenic climate change?* Accessed October 2, 2019, at https://www.filmsforaction.org/articles/syrias-climate-conflict/.

Raknerud, V., & Hegre, H. (1997). The Hazard of War: Reassessing the Evidence for the Democratic Peace. *Journal of Peace Research,* 34(*4*), p. 385-404.

Reynal-Querol, M. (2002). Ethnicity, Political Systems, and Civil Wars. *Journal of Conflict Resolution,* 46(*1*), p. 29-54.

Russett, B.M., & Oneal, J.R. (2001). *Triangulating Peace: Democracy, Interdepence, and International Organizations.* New York: W.W. Norton.

Salameh, M.B. (2021). Water Wars: Are Ethiopia, Turkey, and Iran Leading to Water Armageddon? *Middle East Policy,* pp. 1-11. DOI: 10.1111/mepo.12547

SANA [Syrian Arab News Agency]. (2015a). *Water Resource Minister: Turkey violates agreements on water share.* Accessed August 3, 2021, at http://www.sana.sy/en/?p=45392.

SANA [Syrian Arab News Agency]. (2015b). *Premier: Syria and Iraq have rights to Euphrates water which Turkey has no right to deny.* Accessed August 3, 2021, at http://www.sana.sy/en/?p=45453.

SANA [Syrian Arab News Agency] (2020). *Al-Jafaari calls on Guterres to intervene and stop Turkish crime of depriving Hasaka of drinking water.* Accessed August 4, 2021, at http://www.sana.sy/en/?p=200676.

SANA [Syrian Arab News Agency]. (2021). *Water Resources Minister affirms Government will take measures to confront drop in water level of Euphrates.* Accessed August 4, 2021 at http://www.sana.sy/en/?p=231899.

Sen, A. (1994). Liberty and Poverty: Political Rights and Economics. *New Republic,* January 10, p. 31-37.

Shamout, N. (2015). Syrian perspective on transboundary water management in the Orontes Basin. In: R. Ballabio, F.G. Comair, M. Scalet & M. Scoullos (Ed.). Science diplomacy and transboundary water management – The Orontes River case (ed., pp. 79-108). Venice, Italy: Unesco.

Stalley, P. (2003). Environmental Scarcity and International Conflict. *Conflict Management and Peace Science,* 20 (*2*), p. 33-58.

Toset, H.P.W., Gleditsch, N.P., & Hegre, H. (2000). Shared Rivers and Interstate Conflicts. *Political Geography,* 19(*6*), p. 971-996.

UN. (2020). *Statement by Syria's Representative to the UN Dr. Bashar Ja'afari during a Security Council session on situation in Syria.* Accessed August 4, 2021, at https://www.un.int/syria/statements_speeches/statement-syria%E2%80%99s-representative-un-dr-bashar-jaafari-during-security-council.

UNHCR. (2021). *Syria Refugee Crisis - Globally, in Europe and in Cyprus.* Accessed June 9, 2021, at https://www.unhcr.org/cy/2021/03/18/syria-refugee-crisis-globally-in-europe-and-in-cyprus-meet-some-syrian-refugees-in-cyprus/.

Varela-Ortega, C., & Sagardoy, J. [Food and Agricultural Organization of the United Nations (FAO)] (2001). *Final Report on Agriculture Water Use (Syria)*. DOI: 10.13140/2.1.2873.5048

Vasquez, J. (1993). *The War Puzzle.* Cambridge: Cambridge University Press.

Vasquez, J. (1995). Why Do Neighbors Fight? Proximity, Interaction or Territoriality? *Journal of Peace Research,* 32 (*3*), p. 277-293.

VOA [Voice of America]. (2021). *Water Drop in Euphrates River Increases Tensions Between Syrian Kurds, Turkey.* Accessed June 22nd 2021, at https://www.voanews.com/extremism-watch/water-drop-euphrates-river-increases-tensions-between-syrian-kurds-turkey.

Westing, A. (1985). *Explosive Remnants of War: Mitigating the Environmental Effects.* London: Taylor and Francis, for Stockholm International Peace Research Institute.

Worldometer. (n.d.). *Syria Population.* Accessed June 24, 2021, at https://www.worldometers.info/world-population/syria-population/.

Worldwater. (n.d.a). *Water Conflict Chronology*. Accessed June 9, 2021, at http://www.worldwater.org/conflict/list/.

Worldwater. (n.d.b). *Water Conflict.* Accessed June 9, 2021, at https://www.worldwater.org/water-conflict/.

Yin, R.B. (2014). *Case Study Research - Design and Methods*. Fifth Edition. Los Angeles: SAGE Publications.

Acknowledgements

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Appendix: List of Figures and Tables

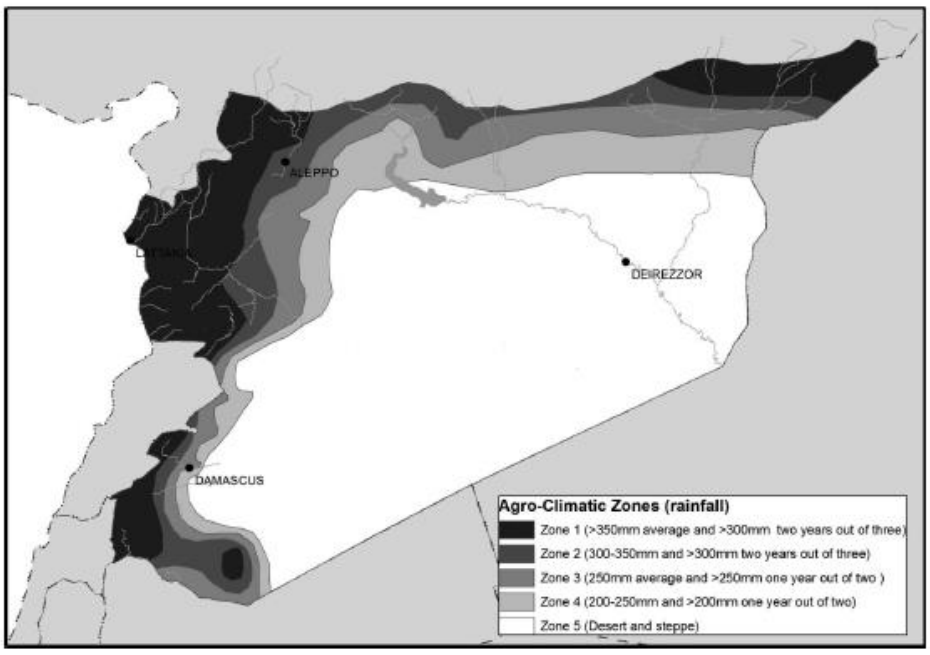

Figure 1: Zone boundaries in Syria. Source: Barnes, 2009, p. 516.

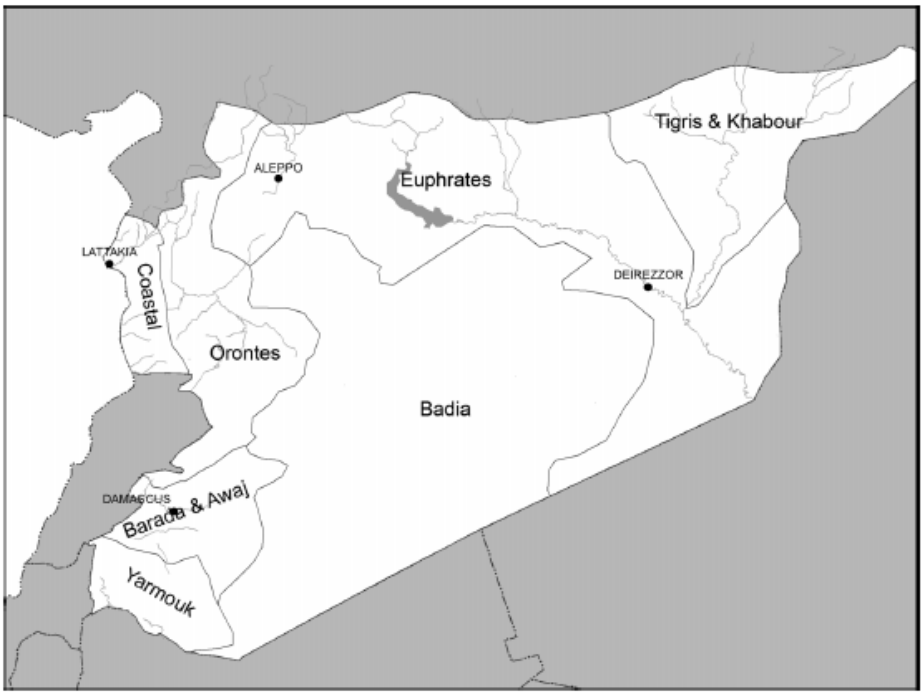

Figure 2: Map of basins used by Syrian government. Source: Barnes, 2009, p. 518.

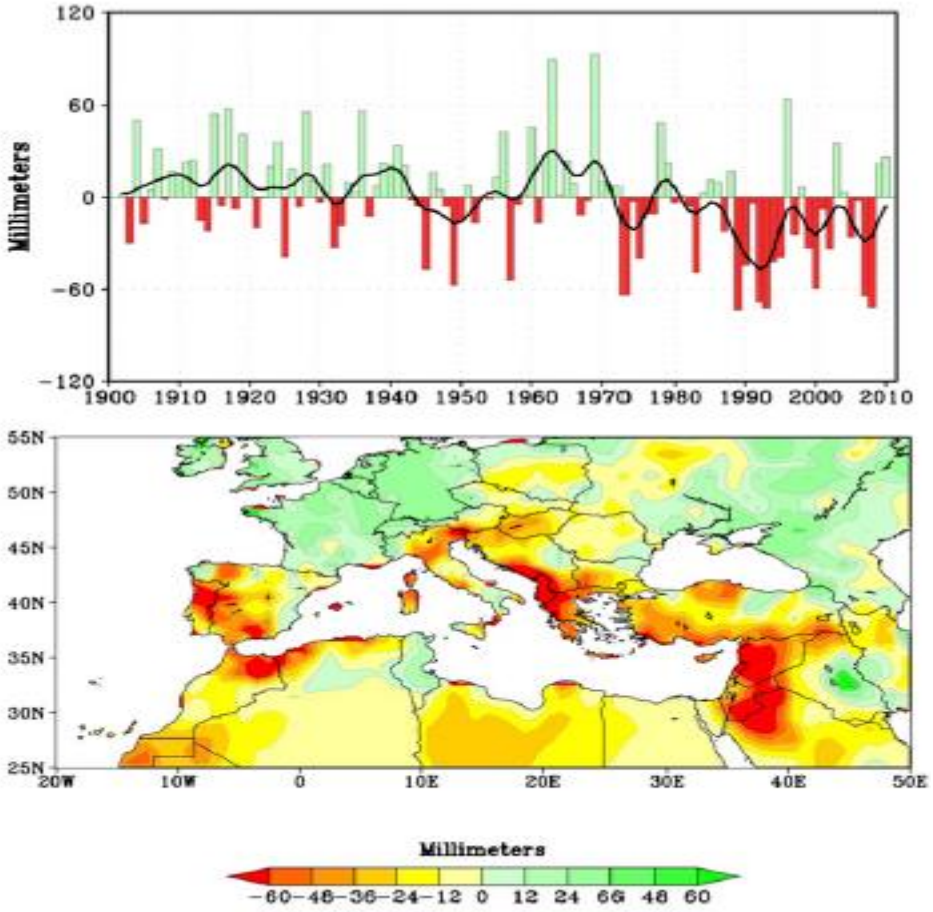

Figure 3: Millimeters of winter rainfall in 1902-2010, with a rainfall drop in 1971-2010. Red and orange areas show increased winter droughts in 1971-2010 compared to 1902-2010. Source: Gleick, 2014, p. 336.

Figure 4: Conceptual model Malthus theorem.

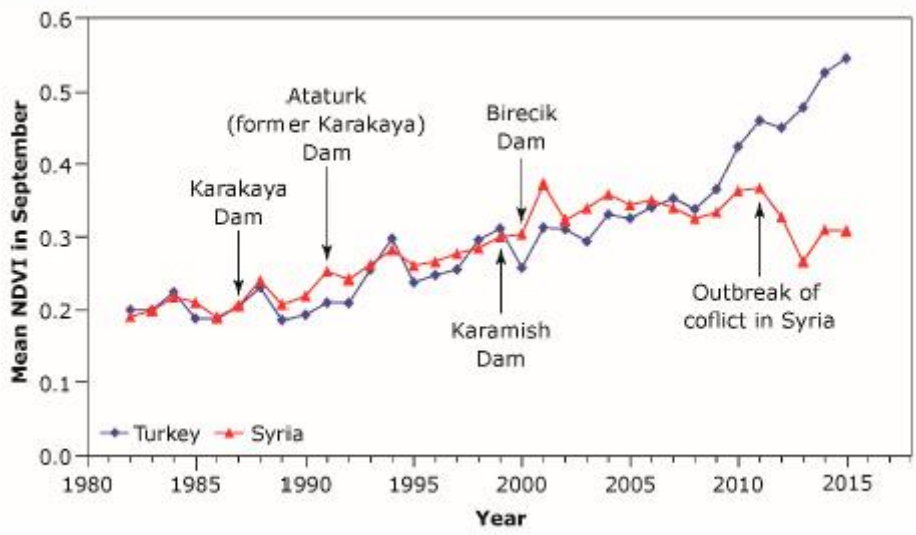

Figure 5: Time series of mean Normalized Difference Vegetation Index (NDVI) in September in Turkey and Syria. Data derived from a combined dataset of NOAA-AVHRR and MODIS spaceborne systems.
Source: Karnieli, et al., 2019, p. 6.

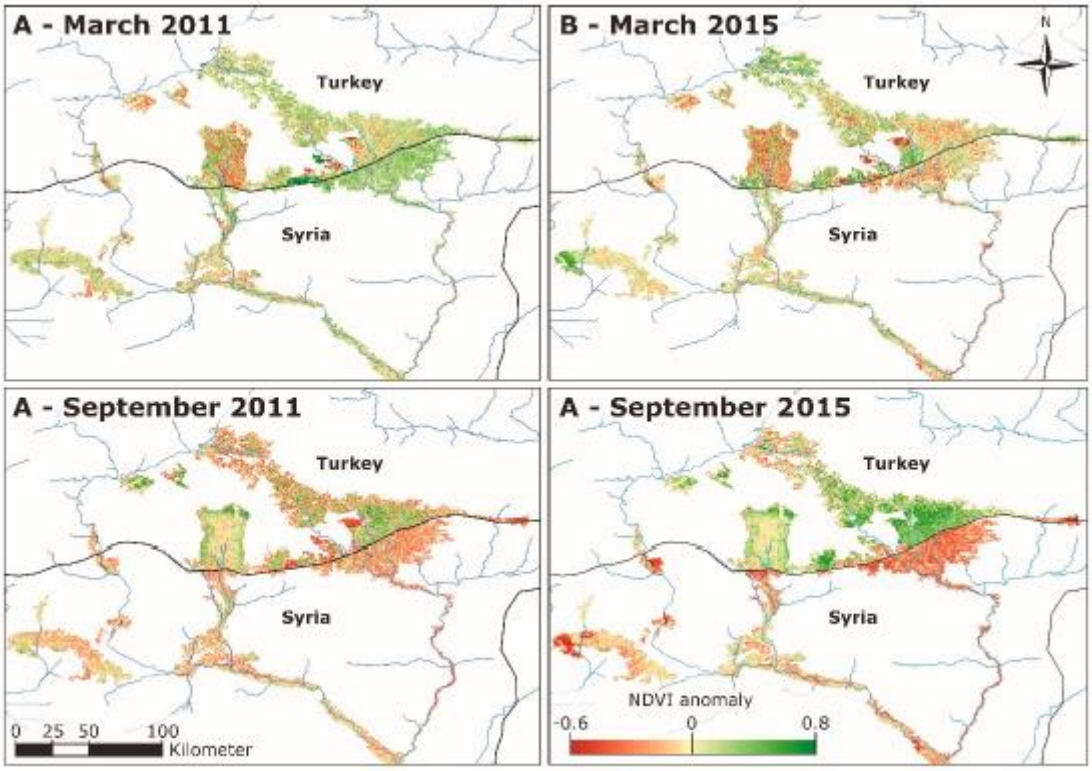

Figure 6: NDVI anomaly, data obtained from MODIS spaceborne system. Source: Karnieli, et al., 2019, p. 7.

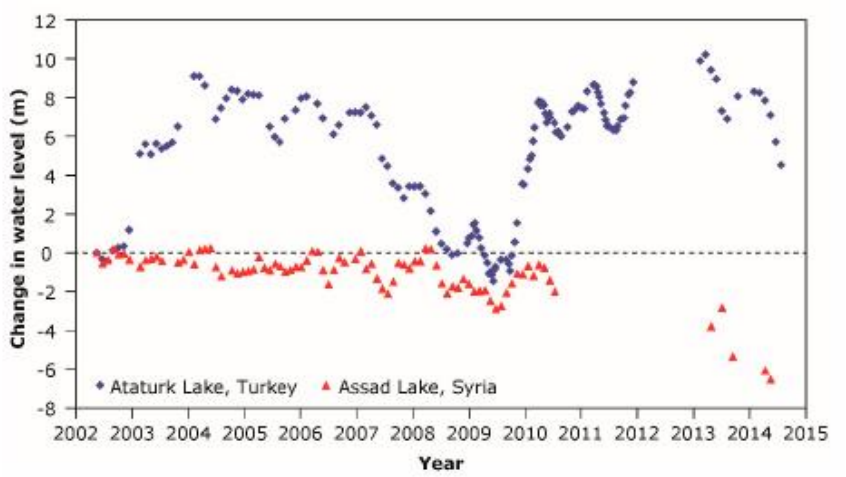

Figure 7: Water levels in the Ataturk Lake in Turkey and the Assad Lake in Syria, measured from 2002 until 2015. Water levels are overall stable until 2010, except for the dip observed in the Ataturk Lake from 2008 until 2010. Data obtained from several space missions, found here https://dahiti.dgfi.tum.de/en/. Source: Karnieli, et al., 2019, p. 7.

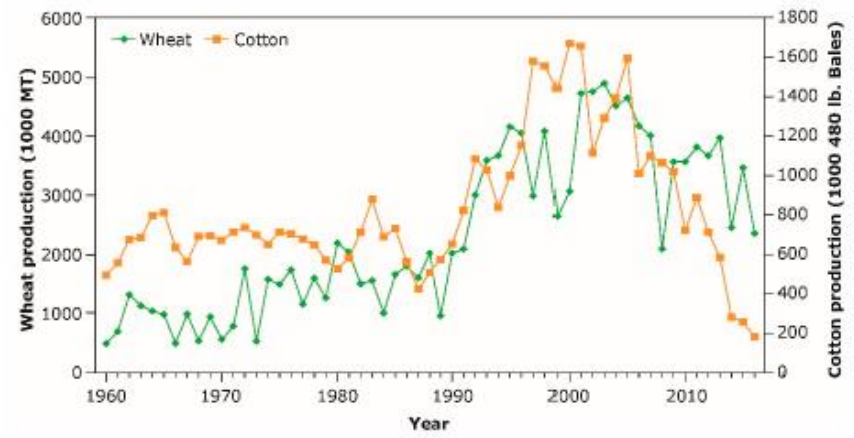

Figure 8: The production of Syrian wheat in the winter and Syrian cotton in the summer measured from 1960 until 2016. Source: Karnieli, et al., 2019, p. 9.

Cause	part 1	part 2	part 3	Cause
Externally-induced freshwater scarcity	Failed crops in Syria	Migration from rural to urban areas	Uprisings in Syrian cities	Syrian Civil War outbreak

Table 1: Causal parts of how Externally-induced freshwater scarcity led to triggering of the Syrian Civil War.