

Droughts and political violence in India: A case study approach

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Abstract

The drought-conflict link has been studied before; however, inconclusive results indicate more research is necessary to understand this relationship. In this thesis the relationship between droughts and political violence is studied in India. As the literature indicated that the drought-conflict link is context dependent, I chose to do a single case study. This way I could include the sociopolitical context as well. I identified a causal mechanism from the literature connecting droughts to different forms of political violence. Using process-tracing this mechanism was tested in drought-affected regions in India. The results indicate that inadequate water governance at the state level, coupled with substandard water infrastructure, exacerbated water scarcities, thereby increasing the likelihood of protests and riots in areas hit by drought. In addition, inadequate water governance in drought-affected areas increased the likelihood of communal violence. However, the influence of water infrastructure on the incidence of communal violence was not definitive, and no evidence was found to suggest that water-related grievances played a role in such conflicts. Implications for India's water governance and infrastructure are discussed based on the findings.

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Chapter 1: Introduction

Over the last decade the world has reached a record regarding the carbon emissions into the atmosphere (United Nations, 2022). In so doing, the world is on a fast track to disaster, according to António Guterres the current Secretary General of the United Nations (UN). Additionally, the chief of the UN states we are currently on a pathway of global warming which is double the 1.5 degree, which was agreed upon in the Paris agreement in 2015 (United Nations, 2022).

Already, the emissions of greenhouse gases are affecting the globe. For instance, the temperature has risen almost 1.1 degrees compared to pre-industrial times, glaciers are melting, sea levels are rising and more intense heatwaves are occurring in the world (Jackson, n.d.). Even worse, according to the sixth assessment report of the Intergovernmental Panel on Climate Change (IPCC), the rise of the global temperature is resulting in more frequent climate hazards (Pörtner et al., 2022). A climate hazard could be a drought, flooding, hurricane, or other extreme weather events impacting a society.

Climate hazards have also been linked to conflicts (Buhaug & von Uexkull, 2021; Koubi, 2019; von Uexkull, 2014). In earlier literature climate hazards have been linked to state-based conflicts, such as a civil war (Ide, 2018), but also related to lower scale violence, such as communal violence (Petrova, 2022), or social unrest (Ide, Kristensen, et al., 2020). It is important to distinguish between these types of conflicts when assessing how a climate hazard can lead to conflict, as different types of conflicts presumably have different dynamics which can cause it to occur.

Since the climate change – conflict nexus seems to be a complex relationship, it would be prudent to conduct research about this relationship which focuses on a specific type of climate hazards. Above all, different natural disasters impact society in various ways making the dynamics how it leads to conflict also different. This thesis will focus on the drought-conflict link as the exact mechanism for how droughts lead to conflicts remains unclear (von Uexkull, 2014). This avenue of research can also be placed into the broader literature debate whether and how climate change leads to conflicts.

Hitherto, there are findings demonstrating no or a small relationship between droughts and conflict (Theisen et al., 2012; van Weezel, 2019), other scholars do find a relationship (Maconga, 2023; Unfried et al., 2022), whereas some scholars find this relationship between droughts and conflict to be conditional on several circumstances (Ide, Lopez, et al., 2020);

Vesco et al., 2021). The current thesis will focus on droughts and attempts to add to the literature of how droughts can lead to conflicts.

Furthermore, in this thesis I will only focus on one country and find contextual links on how this could explain how droughts led to increased conflict activity. As I agree with Ide, Lopez, et al. (2020) in saying that the drought-conflict is highly context dependent, I regard it as prudent to perform an in-depth single-case study focusing on one country. This way I can find the contextual links on how droughts led to increased conflict activity under specific circumstances. In addition, I will only study how droughts influenced small-scale conflicts, as the literature indicates that environmental stress is more likely to result in low-level inter-group conflicts instead of large-scale civil wars (Benjaminsen et al., 2012; Meier et al., 2007). The type of small-scale conflicts this study is centered on is political violence.

In this work, I will situate the link between droughts and political violence in the bigger debate concerning climate change and conflicts. I will endorse the argument how climate change is a conflict amplifier, meaning that several conditions make a society more vulnerable to conflicts when it faces adversities from climate change. I have organized these conditions based on the economic and political approach. Finally, I also construct a causal mechanism for how droughts cause political violence.

This thesis will focus on India, a country that frequently experiences drought and is particularly vulnerable to its effects. According to the Notre Dame Global Adaptation Initiative (ND-GAIN) Country Index (2020), which assesses nations' vulnerability to climate change, many of the most susceptible countries are located in the African continent. However, South East Asia and South Asia also contain several countries that are at risk, and India is no exception. Ranked 132nd out of 182 countries in the ND-GAIN Country Index, India is shown to be significantly vulnerable to climate change, with the index indicating that countries with higher rankings are less vulnerable.

Also, India's population is largely dependent on agriculture as more than 50% of the working people in India work in the agricultural sector (Panda, 2016). The production of crops in India is heavily dependent on the South-West monsoon. When there are negative variations to this monsoon rainfall, the agricultural production will feel the consequences. This can lead to great loss of income for millions of farmers (Panda, 2016). According to Pal and Al-Tabbaa (2011) the monsoon rainfall in India is highly susceptible to variations leading to meteorological droughts over big parts of India. Moreover, according to Bhardwaj et al. (2020) droughts are one of the most detrimental natural disaster that India faces; It affects

India's economy, food and water security, and the socioeconomic well-being of the population in India.

Thus, the current thesis will focus on political violence in drought-affected areas in India. Political violence is categorized into 3 different types of political violence, namely protests, riots, and communal violence. Among these categories, protests are considered the least conflictual, followed by riots, which are more conflictual, and communal violence, which is seen as the most conflictual. I will attempt to unravel how in India droughts are connected to political violence. I have chosen to study droughts in India within a specific time frame, which I will elaborate in chapter 3. As such, this has led to the following research question of my thesis:

What effect does drought have on the likelihood of political violence in drought-affected areas in India between 2002-2018?

The goal of my thesis is to find out how droughts contribute to the onset of political violence in India. I will identify a causal mechanism based on findings in the literature connecting droughts to political violence. This causal mechanism will be tested in the context of India. By performing a single-case study I will include the political context in which the conflicts take place, which has often been neglected by scholars studying environmental stressors and social conflict (Bernauer et al., 2012). The method I adopt in my thesis is process-tracing. In so doing, my thesis will contribute to the broad literature of climate change and conflicts.

1.1 Scientific relevance

In comparison with other research my thesis adds to the literature due to the method I have adopted. I use process-tracing to a single-case, thereby testing a mechanism in a sociopolitical context. This is different from most studies examining the drought-conflict link. Most scholars in the literature study the drought-conflict link using quantitative measures for droughts and conflicts and compare this across countries or regions. This approach is valuable for identifying general patterns, but it overlooks within-case variation. Such variation is crucial in my analysis, as it provides a nuanced understanding of the connections between droughts and conflicts.

Furthermore, quantitative studies alone may not capture the full picture of whether drought actually causes water scarcity, as scarcity is influenced by more than just supply. According to Homer-Dixon (1999) scarcity of resources also depends on the demand side of a region. For example, when more people in a region have to compete for water, it can lead to water scarcity, even if the absolute amount of water hasn't diminished. Moreover, the concept of structural water scarcity must not be overlooked. This refers to the unequal distribution of water among end-users, which can cause marginalized people to experience water scarcity earlier and more severely in the face of droughts.

Lastly, this thesis will focus on India. Earlier conducted studies on the drought-conflict link were mostly focused on Africa, therefore there is a dearth in the literature studying this link on countries outside of Africa (Adams et al., 2018), especially in South Asia and South East Asia compared to other regions in the world (Nordqvist & Krampe, 2018). Hence, more research in regions outside of Africa concerning the drought-conflict connection is called for.

1.2 Societal relevance

It is important to understand the link between droughts and conflicts, as this is crucial in policy formulation to mitigate such risks. A more detailed understanding of the processes involved is necessary for implementing policies to reduce conflict risk in hot periods (Burke et al., 2015). This could make a state less vulnerable to droughts in the future. Hence, this can break or prevent the potential cycle of exposure to climate hazards and conflicts (Buhaug & von Uexkull, 2021). To elaborate, climate hazards don't hit all countries the same way; some are hit harder. When these places get hit by a climate hazard such as a drought, it can lead to fighting. Also, if there has already been fighting, it makes it harder for these countries to handle climate problems. This can trap a country in a negative cycle of more fighting and more climate problems (Buhaug & von Uexkull, 2021).

Moreover, studying the dynamic consequences of droughts on India is warranted as in the future droughts will affect more areas, happen more frequently and will be more severe in India, which is the result of global warming (Bisht et al., 2019). This could also have serious implications for regional water supply in India. Since a decrease in local water mass after a drought is related to an increase in social conflicts (Unfried et al., 2022), it seems crucial to study how this relation could manifest itself in India. Better understanding this specific mechanism in India could enable policymakers or NGO's operating in India to prevent droughts to lead to conflicts.

1.3 The argument

In the theory chapter I will organize the literature concerning the climate change – conflict connection based on the economic approach and the political approach. Both approaches do not exclude each other, and I adopt a nuanced approach to explain the causal mechanism clarifying how droughts have led to different forms of political violence in India. This nuanced approach takes the complexity in consideration and values the interconnectedness between the different economic and political conditions. The argument postulates that a drought, characterized by a lack of rainfall, affects water availability. Several conditions of the drought-affected area enhance the likelihood for political violence. These are inadequate water governance, poor water infrastructure, and preexisting water-related grievances. The findings indicate how both inadequate water governance and poor water infrastructure increases the likelihood of protests and riots. Poor water governance also seems to contribute to the likelihood of communal violence. However, the influence of water infrastructure on the incidence of communal violence was not definitive, and no evidence was found for water-related grievances to play a role in such conflicts.

1.4 Outline thesis

The thesis will proceed as follows. Hereafter, I will introduce the climate change – conflict nexus and outline the literature concerning this topic. Based on the literature, I will describe the causal mechanism I argue to be crucial in explaining how droughts lead to political violence in India. Subsequently, I will clarify the method I employed in detail. Afterwards, in my analysis I will describe my findings. These findings will be discussed in light of the nuanced approach in chapter five. Finally, in my conclusion, I will summarize my findings, discuss the implications, acknowledge the limitations of my study, and make suggestions for future research on this topic.

Chapter 2: Literature review and theoretical approach

In this chapter, I will begin by introducing the link between drought and conflict by reviewing the relevant literature on this topic. I will organize the literature on the basis of the economic approach and political approach. Subsequently, I will explore how droughts are related to political violence and portray the causal mechanism I adopted in India.

2.1 The drought – conflict link

The drought – conflict link can be situated in the larger debate concerning how climate change is related to conflicts. This debate concerning climate change and conflicts is about whether there is a link between climate change and conflicts, and when this link exists, how exactly should we understand this connection.

Scholars are divided on this issue, with some advocating for a significant link between climate change and conflict, while others contend that the evidence is inconsistent across studies (Koubi, 2019). Despite this debate, the climate change – conflict nexus is a widely studied topic, which is still growing. Within this body of work, there are scholars studying a direct and an indirect relationship between climate change and conflicts.

Scholars studying a direct pathway measure climatic variations and relate this to the onset of conflicts. For instance, scholars show how increased temperature from climate change makes people more aggressive, causing increased crime rates (Mares & Moffett, 2016; Ranson, 2014). Or a direct pathway where climate induced scarcity and conflicts are linked to each other (See for instance: Fjelde & von Uexkull, 2012; Maystadt et al., 2014).

Nevertheless, this direct pathway is contested, because mixed results are often found and this direct pathway neglects confounding factors contributing to the climate change and conflict link (Koubi, 2019). Measuring climate variations on its own is not valuable, because the link between climate change and conflicts seems to be more complex. The indirect pathway could be more valuable as it focuses on consequential (economic) outcomes of climate change, for instance, agricultural production, migration or unemployment and how this causes conflicts (Koubi, 2019). This way one can better understand the causal mechanism for how climate change causes conflicts.

Moreover, when one studies the relationship between climate change and conflicts, one should also consider the socioeconomic and political context. These conditions can strengthen or weaken the effect of climate change on conflicts. Studies that have included contextual variables in their analysis show how droughts are more likely to lead to conflicts

when road infrastructure is lacking or there is inadequate water access (Detges, 2016; Jones et al., 2017). Also, regions that are agricultural dependent or have politically excluded groups are more likely to experience conflicts when it is drought-affected (Ide, Brzoska, et al., 2020; von Uexkull, 2014; Von Uexkull et al., 2016).

All in all, there is evidence for a conditional link between climate change and conflicts. Specifically, there seems to be a consensus on the notion that climate change can be seen as a threat multiplier (Burke et al., 2015; Koubi, 2019). In other words, climate change on its own is not a sufficient condition to lead to conflicts. Climate change can be seen as a factor that intensifies existing threats such as political instability, resource scarcity, and social tensions.

2.2 Theoretical overview

In the literature concerning climate change and conflict, a plethora of scholars have studied different political and societal circumstances which enhances the likelihood of climate change to cause conflicts. To organize this literature, I have chosen to incorporate the main studies connecting climate change to conflict into a broader theoretical framework. According to Ide, Brzoska, et al. (2020) in the literature about the climate change – conflict link, two broad categories of mechanisms can be identified, which seems to be relevant in explaining the link. Ide and colleagues (2020) call this the grievance- and opportunity-based categories, but this is similar as the political approach and economic approach. I will from here on call this political approach and economic approach. By explaining these approaches, I am able to relate the literature to these broader theories, which helps to understand the findings.

2.2.1 Economic approach

To elaborate on the economic approach, I will first introduce the influential paper by Collier and Hoeffler (2004). These authors can be seen as one of the pioneers in the literature introducing the economic approach opposed to the political approach. In their paper, the authors state that the political approach and the economic approach differ in their view on what the motive is for people to start rebellion and what the best explanation is for rebellion. Under the economic approach, the primary motive driving people to engage in conflicts is greed. In specific situational circumstances people see an opportunity to benefit their group and will engage in rebellion.

In the research of Collier and Hoeffler (2004) they introduce several variables as proxy measures for the different approaches to test which approach gives the best explanation

for civil wars. For example, to represent the economic approach, the authors use variables such as a government's military strength and the percentage of land covered by forests. These variables would indicate whether there is a favorable opportunity for rebellion. To represent the political approach indicators for political repression and polarization were included. Collier and Hoeffler (2004) use these proxy measures to test the economic approach model versus the political science model. Afterwards, the authors conclude that the economic model explains civil war onset better. The authors suggest that rebel groups are more likely to initiate conflict when they perceive favorable opportunities for engagement.

To elaborate more on these opportunities, the economic approach argues that these opportunities are related to resources, recruitment and geography (Murshed & Tadjoeeddin, 2009). Rebels are more likely to engage in conflict when they perceive favorable conditions that enable them to acquire resources, recruit personnel, or gain a geographical advantage over their adversaries. This notion also relates to the concept of opportunity costs, and would argue that rebels make a rational economic calculation in their decision to engage in conflict. When opportunity costs are low, violence is more likely.

In essence, the theory holds that rebels will engage in conflicts when there is an economic opportunity. I argue this holds not only specifically for rebels, but any actor can be motivated to engage in a conflict when there is a favorable opportunity. At the same time, I do not hold this as sufficient condition. As such, economic opportunities make it more likely for people to take part in a conflict, however, it surely does not necessarily have to lead to conflict. Below, I illustrate how various preexisting societal opportunities can escalate the risk of different types of conflict in the context of climate change.

Economic approach and the climate change – conflict nexus. There are several scholars who identified economic opportunities enhancing the likelihood of climate change to cause conflicts. I define these opportunities as conditions or circumstances that reduce the costs, increase the benefits, or otherwise make it more feasible for people to initiate or sustain (non)violent conflict against the state or another group.

To begin with, the adverse effects of climate change on agriculture has often been linked to conflicts (Koubi, 2017). In the Philippines, for example, researchers demonstrate how extreme rainfall variation and its impact on agriculture influences conflict intensity between insurgents and the state (Crost et al., 2018). The authors find how an abundance of rainfall in wet season decreases rice production, and increases conflict intensity. Contrary, an increase in rainfall during dry season increases rice production, and decreases conflict

intensity. These effects were stronger in regions with higher dependency on agriculture. Explaining these findings, Crost et al. (2018) argue that when agriculture production fails, the opportunity costs to join insurgent groups decreases, whereas a good harvest has the opposite effect.

In addition, climate change issues with agriculture can also lead to political unrest. Failure of agriculture due to climate change can cause a sharp increase in food prices, making riots and protests more likely (Koren et al., 2021; Smith, 2014). Basically, when climate change leads to crop failure and high food prices, people might find it hard to buy what they need, and this can make people frustrated. When people are struggling and feel trapped without any means to express their dissatisfaction, protesting or rioting might seem like the only way to deal with the food insecurity. Moreover, this way the affected people can potentially get the attention of the government forcing it to act upon relief measures.

Beyond agricultural dependency, low levels of economic development and pervasive poverty can also be seen as conditions enhancing the likelihood of conflicts (Ide et al., 2014; Koubi, 2019). Countries facing underdeveloped economies experience greater difficulties mitigating or adapting to climate change (Buhaug & von Uexkull, 2021). These economies are typically more focused on resource extraction from the environment, such as fishery, mining or agriculture. Notable shifts in the climate can, as a result, impact these economies significantly.

These economic downturns are most severe for the economic disadvantaged population in a society (Buhaug & von Uexkull, 2021). A combination of the economic burden and sociopolitical issues, which I delve into later, can cause heightened tensions among the affected population. When individuals face diminished economic prospects and increased hardships due to environmental factors, the relative benefits of joining different types of conflicts may rise. People may take part in protests or riots, aiming for government assistance for the endured economic hardship. Alternatively, individuals may become involved in disputes with neighboring communities as they compete for scarce resources to alleviate their economic hardships. In essence, the economic desperation, coupled with the tangible effects of climate change, creates a fertile ground for conflicts.

Lastly, I posit that the state of the road and water infrastructure is another amplifying societal condition related to the economic approach. Several scholars demonstrate how existing issues with the infrastructure coupled with climate extremes enhances the likelihood for conflicts. For instance, Detges (2016) demonstrate how lacking adequate road infrastructure in sub-Saharan Africa makes the likelihood of communal conflicts more likely

when regions are struck by a drought. In a similar vein, Cao et al. (2022) studied how water infrastructure can mitigate the effects of droughts on communal conflicts in East Africa and the Sahel belt. Specifically, they state that the positive effect of droughts on conflicts can disappear when the sanitation and water access is improved beyond a certain threshold. In my view, these studies highlight the significance of road and water infrastructure in either mitigating or amplifying the climate change – conflict link.

There are multiple explanations how the state of the infrastructure is crucial in the climate change – conflict link. First, regions with poor road infrastructure impedes the region's resilience to extreme weather, since good road infrastructure could enable the drought-struck rural population to find alternative ways for revenue (Detges, 2016). Second, adequate road infrastructure facilitates the provision of relief from extreme weather by NGOs and government agencies. Finally, a sophisticated road infrastructure facilitates the transportation of military personnel, enabling the government to intervene easier when there are violent outbursts (Zhukov, 2012). This presumably also discourage people to get involved in conflicts.

In addition to roads, having good water systems is key to lowering the chance of conflict caused by climate change. According to Cao et al. (2022) providing access to water and sanitation improves economic conditions and public health to the local population and thereby reduces the risk of conflict. Clean water access and sanitation counter the negative effect of climate change pressure, such as a drought, on the local economy (Adger et al., 2014). Naturally, increased access to water can support farmers for irrigation purposes and feeding their livestock. This way, they are more resilient to the effects of a drought.

2.2.2 Political approach

While the economic approach offers opportunities to explain conflicts, the political approach predominantly centers on grievances. Stewart (2008) provides a distinct perspective on these explanations for conflict, aligning more with the political viewpoint. While she acknowledges the role of personal gain (greed) in motivating conflict, Stewart (2008) contends that many conflicts are primarily driven by group identity (grievances)

Along this line Stewart (2008) argues that groups can be mobilized based on shared identities. The salience of certain identities can be enhanced by political leaders, the media or an educational system, for example. Accordingly, she asserts that without grievances articulated by leaders and their followers, large-scale mobilization for violent action is unlikely. The motivation to mobilize are *horizontal inequalities*, which she postulates as:

“Severe and consistent economic, social, and political differences between culturally defined groups” (p.12). When one group perceives that another group has more resources or opportunities this may give a sense of relative deprivation, which is the feeling of being deprived compared to another group (Walker & Smith, 2002). These are feelings of injustice or unfairness. Notably, this is different than objective inequalities between individuals which are called *vertical inequalities*.

Additionally, Stewart (2008) distinguishes different categorical areas of horizontal inequalities. First of all, horizontal inequalities can exist in the political arena, where there is inequality in political power for certain groups. Secondly, economic horizontal inequalities can exist within a society, where it relates to certain groups lacking access and ownership of resources, or lacking possibilities to find jobs. Thirdly, horizontal inequalities can also be socially, which means inequalities in access to services (healthcare, education, water or sanitation e.g.). Lastly, horizontal inequalities can also be related to cultural status of a group, which is about the extent to which a certain group’s cultural practice is accepted or not.

These categories of horizontal inequalities are interrelated, not mutually exclusive (Stewart, 2008, p. 13). One can imagine that being left out in the political arena comes with economic consequences as well, for example. When there are severe horizontal inequalities, this can be a motivator for a group to mobilize itself. If the government is not able to react properly to this group’s demands, it is likely this would lead to violence as well.

Importantly, horizontal inequalities on its own will not definitely lead to conflicts, there are conditional aspects making this more likely to occur (Stewart, 2008). These conditional aspects can be related to the political structure of the state, the economic welfare of the society, or the relative size of the cultural groups. In the subsequent section, I will outline how the literature determines the way existing societal grievances shape the relationship between climate change and conflict.

Political approach and the climate change-conflict nexus. In the literature there are several conditions identified, which I argue to be related to the political approach. These existing societal conditions make conflicts from climate change more likely to occur. These different conditions overlap, as, from my point of view, they provoke grievances among people making them more willing to partake in conflicts.

Starting off, I contend that unequal access to resources in society can foster grievances among various groups. When climate extremes intensify these disparities, the potential for conflicts rises. Climate-induced economic decline is likely to motivate individuals or groups

to get involved into conflicts to redistribute wealth (Cederman et al., 2013). Evidence for this can be found in several articles showing how the existence of marginalized groups who are economically deprived, make it more likely for conflicts to occur. In a multi-method study executed by Ide, Brzoska, et al. (2020), it was, for instance, shown that countries with political excluded ethnic groups are more likely to experience conflict in the face of climate extremes. Likewise, Raleigh (2010) highlights that political and economic marginalized communities in the Sahel are prone to communal conflicts during drought-induced water scarcity.

To elaborate more on this, I contend that scarcity induced by climate extremes fuels preexisting feelings of relative deprivation. When governments neglect relative deprivation, marginalized groups often face unequal treatment, exacerbating grievances against the state. Hence, it would increase perceptions of favoritism by the government (Martin, 2005). Consequently, marginalized groups with relatively little access to resources are more likely to engage in conflicts against the government.

Building on this reasoning, the same mechanisms that drive conflicts can also spur marginalized groups to protest, as a visible and collective expression of their relative deprivation and discontent with governmental favoritism (Asingo, 2018). At the same time, communal conflicts are also more likely to occur among marginalized groups facing climate extremes. Marginalized groups, facing heightened scarcity due to climate extremes like droughts, are more prone to communal conflicts due to grievances and their limited capacity to challenge the government, making it more likely to get into disputes with other communities.

Furthermore, the literature also indicates how a history of conflicts makes future conflicts more likely. Koubi (2019) asserts in a review that climate change tends to spur conflicts especially in regions already marked by conflicts. Similarly, Cappelli et al. (2023) empirically examined how climatic conditions affect conflict frequency in Africa and found that regions with histories of conflict are more susceptible to recurrent violence. Another study highlighted the role of ethnic cleavages, showing that under drought conditions, nonviolent conflicts arose among groups that had previously been in broader conflicts before the drought occurred (Ide, Lopez, et al., 2020).

Based on these studies, I consider grievances based on earlier conflicts a condition making renewed conflicts more likely. Presumably, these conflicts can arise along ethnic tides. Given there is a conflictual history between different ethnic groups (Sarbah & Koren, 2021). In addition, the conflict can also be directed against the government. This is more

likely when social groups have a conflictual history with the local or national government. In my view, ethnic groups or populations with a conflictual history foster a long-lasting mistrust towards each other or against the government. This makes cooperation in times of climate adversities harder, just as it makes peace negotiations more difficult. Furthermore, in areas with existing conflictual tensions, climate-induced resource scarcity can become another point of conflict given the increased competition for resources.

2.2.3 A nuanced approach

Most studies highlight the complexity of the climate change-conflict nexus and argue for the inter-connectedness between different conditions, which together make conflict more likely. Von Uexkull (2014), for instance, does find agricultural dependency to be a pre-condition making civil conflict more likely, however, the author also emphasizes the interlinkage with other conditions, such as already existing tensions in the agricultural area and the presence of rebel fighters. Just like von Uexkull (2014), most other scholars also note that a combination of different pre-conditions increases the vulnerability of an area to conflicts when it is affected by climate change adversities.

A nuanced approach is therefore more in line with Keen (2012), as he finds himself between the two mentioned approaches. The author does not put greater value to either the political approach or the economic approach. Keen (2012) has criticism on Collier and Hoeffler's (2004) perception that economic motives are the driving factor behind the onset of conflict. For instance, Keen (2012) mentions that Collier and Hoeffler (2004) reject grievances as a motivator for rebellion since they did not find that inequality could predict conflicts. Yet, according to Keen (2012) the authors measured vertical inequalities in their study, which does not represent the perceived inequalities between cultural defined groups (horizontal inequalities).

Based on given examples, Keen (2012) denotes that economic incentives and grievances both (may) interact in the onset and endurance of conflicts. As such, a conflict may start because a certain politically deprived group feels neglected in society but it could endure as the rebels may find themselves economically invested in the conflict. In fact, rebels could perceive that sustaining the conflict could benefit them by getting access to certain resources. Certainly, other interactions between greed and grievances could be possible as well. For instance, a conflict could also have started, because rebels seized an opportunity to increase resources and later mobilize by exacerbating existing grievances.

Without a doubt, this interaction between the economic approach and the political approach makes it harder to extrapolate a generalizable clear-cut view on how a conflict came about. Yet, in my view this is the right assessment and it is indeed the case that economic motives together with motives based on the political approach interact. In one conflict, one of the approaches might be more applicable than in other, however, they do not exclude each other. In-depth research into a conflict, would unravel what mechanism are causing the escalation of the dispute. The economic approach and the political approach both help to understand those mechanisms.

Within this research, I will adopt this nuanced approach, shifting the focus specifically towards political violence as a form of small-scale conflict. Also, I will only assess droughts as the primary manifestation of climate change. The study area is India. Hence, in the subsequent sections I will explain whether and how droughts make political violence more likely in India.

2.3 Droughts and political violence in India

Building on the framework established, this section delves into the specific dynamics of how water shortages from droughts can instigate various forms of political violence within India. My analysis categorizes political violence into protests, riots, and communal violence in ascending order of conflict intensity. I will explain how the lack of water can lead to these forms of political violence and under what conditions this is more likely.

Political violence can be seen as a type of small-scale conflict. Research suggests that the impacts of climate change is more likely on these types of conflicts instead of conflicts on an international or national scale (von Uexkull & Buhaug, 2021). This is partly, because an insurgency against the state, in contrast to small-scale conflicts, requires extensive organizational capacities and financial resources. Moreover, an insurgency is a riskier behavior, making localized small-scale conflicts more likely in the context of climate-related stressors.

Specifically, forms of political violence, such as protests, require less organizational or financial resources and are perceived as a more legitimate way to express discontent. India is a functioning democracy and protests are one of the ways citizens can influence political decisions (Meyer, 2004). When citizens in a drought-affected region experience a lack of drought-mitigating measures, a legitimate way to express their discontent is by taking the streets.

Also, nongovernmental organizations (NGOs), political parties or other external actors are presumably more willing to support such actions, because of its legitimate character. These actors might provide resources and support to organize the protests. Since NGOs are deeply embedded in India's sociopolitical landscape (de Souza, 2010), they could play a critical role in mobilizing citizens to protest in drought-affected regions.

Rioting on the other hand, is often seen as illegitimate because of its violent and destructive nature. Nonetheless, some incidents that escalate to riots may start as peaceful protests. In addition, riots can also occur spontaneously, requiring even less organizational means compared to protests (Hadzhidimova, 2023). Whereas protests are more goal driven, rioters do not necessarily have a common goal. As such, it can be seen as an illegal violent display of frustration. I contend that droughts can cause immediate frustration due to water scarcity, and such spontaneous outbursts of frustration are more likely to lead to riots compared to insurgencies. Insurgencies requires more advanced planning and is less likely to be a spontaneous reaction to a drought. Thus, rioting can be viewed as a form of political violence, which I anticipate being more prevalent in the context of water scarcity resulting from droughts.

Furthermore, communities impacted by drought are likely to compete for water with nearby groups due to urgent needs and closeness, a situation I believe increases the likelihood of communal violence arising from water scarcity, more so than organized insurgencies against the state. Therefore, my thesis concentrates on political violence that excludes state actors. In the following, I will portray how droughts are related to water scarcity, and how I think this causes political violence, such as protests, riots, and communal violence.

2.3.1 Water scarcity and political violence

In my thesis, I consider water scarcity as the key factor in how droughts amplify conflicts, aligning with the earlier argument that climate change serves as a threat multiplier. Scarcity of resources leads to increased competition and via the political and societal climate it increases the likelihood of political violence in the affected area.

The notion that water scarcity leads to conflicts in my thesis comes from the theory introduced by Homer-Dixon (1999). In his book he explains how population growth and climate change will decrease available vital resources in the world, such as water, minerals or other natural resources. Scarcity of vital resources can lead to increased stress within nations and communities, because of the increased competition for resources. Additionally, this could also cause food insecurity and economic problems. As a results, this is likely to lead to

conflicts. Moreover, Homer-Dixon (1999) argues that the likelihood that resource scarcity will cause conflicts is dependent on political, social and economic contextual factors. Hence this theory is in line with seeing water scarcity from droughts as a conflict amplifier.

Nonetheless, Homer-Dixon (1999) does not provide us with a general causal mechanism of how environmental scarcity can lead to conflicts. This is understandable given the context dependency of the relationship. Within my research, however, the context is clear, as it is situated in India. Hence, I will describe a causal mechanism connecting water scarcity from droughts to different forms of political violence.

Water scarcity is a natural consequence of a drought period characterized by erratic rainfall. However, when demand for water is low or the drought-affected area has enough stored groundwater, erratic rainfall does not have to induce a water shortage. As such, I will only focus on cases where it is clear that water scarcity resulted from a drought period.

Empirical studies have already linked water scarcity to different forms of political violence (Almer et al., 2017; Ide, Lopez, et al., 2020). To illustrate, in the study conducted by Almer and colleagues (2017) they find statistical support indicating how intensified drought conditions increase the likelihood of riots in Sub-Saharan Africa. Particularly, in regions where water is scarcer on average and where larger number of groups compete.

Furthermore, in the study of Unfried et al. (2022), the authors demonstrate how a reduction in total water mass in a given area resulting from a meteorological drought increases the likelihood of social conflicts. Specifically, a decrease of one standard deviation in water mass more than triples the chance for social conflicts to occur. The database the authors used for social conflicts consisted of different forms of political violence. In addition, they also show how the demand for water in the drought-affected region is crucial. When demand is higher in an affected region, the likelihood of conflicts increases, as there is a faster reduction of available water.

The connection between droughts and political violence has been highlighted by studies like Unfried et al. (2022) or Almer et al. (2017), which rely on statistical analysis and climatic variables such as temperature and drought duration. However, the absence of conditional variables in these quantitative studies hampers a comprehensive assessment of how water scarcity leads to increased political violence. This limitation is common in the literature, where correlations at the country level are often drawn without considering the sociopolitical context, as described in research by Ide (2017). I concur it as more valuable for research to focus on a single country, which ensures a more precise test of causal mechanisms that take into account within-country variations.

In this work water scarcity is not only tested by assessing the precipitation. I first determine whether an area was affected by a meteorological drought, characterized by a lack of precipitation. Thereafter, I trace whether the given meteorological drought caused water-scarcity as well. Since water scarcity is also dependent on groundwater levels and regional demands, I argue this to be an appropriate way to establish regional water scarcity from droughts. In other words, a lack of precipitation does not have to cause water scarcity, rather it is dependent on the regional capacity to adapt.

2.3.2 Water-related governance

First, I regard the role of the subnational government as crucial in the onset of political violence from water-scarcity. Adequate water governance will decrease the chance of water problems in a region during droughts. The opposite holds for inadequate water governance. Different studies show how this is related to the likelihood of conflicts. This section will explore how water governance can mitigate or exacerbate political violence in times of water scarcity.

In an earlier study it has already been demonstrated how good water management can help in preventing the likelihood of conflicts (Van Huynh et al., 2019). The study focused on drought-affected areas in Vietnam. There it was already found how water sharing principles can alleviate tensions between different groups who needed water. These sharing principles consisted of assessing the water shortages and conflicts between the groups involved. Afterwards, negotiations for an alternative water sharing principle started with all stakeholders involved. When agreement was formed and it was approved by local authorities it was implemented. The authors concluded that stakeholders quickly agreed on a mechanism that was implemented successfully, avoiding conflicts and effectively managing water shortages through cooperation. In my view, this study exemplifies how good practices of water management can reduce tensions between societal groups and prevent conflicts when water is scarce.

On the other hand, inadequate water management is likely to increase the likelihood of conflicts. When water is distributed unequally among different groups in society, these groups are likely to endorse negative perceptions of the state. As a result, they are more likely to display their discontent by protesting or taking part in riots. The government's role in regulating water and improving infrastructure is pivotal. Investments in better irrigation systems and water storage facilities, alongside policies ensuring equitable water access, are

critical in reducing grievances. Overall, adequate water governance can potentially decrease grievances against the government itself, but also between social groups in India.

Water management in India is a difficult task (Tortajada, 2016). This is due to the political system in India. The party or parties in power of the national government are not always the same as the parties governing the states of India. Moreover, at the city or municipal level of governance, the ruling parties might also be different from the national government. Various parties in control at different levels of Indian governance may clash over their respective water policies, leading to non-cooperation or conflicts among government levels. Also, the ruling parties at the different levels of governance change every three to five years, which makes long-term water policy implementation a hard task.

Although water management is complex in India, my thesis will focus specifically on state-level water governance. According to India's constitution, the state is tasked with water management and the development of water resources (Pandit & Biswas, 2019). While the national government provides financial resources to a certain extent, the state is predominantly in charge of water governance. Thus, in my view, it's essential to focus on the various states in India and examine their differences in water governance.

To elaborate, states in India are responsible for policy development concerning water management, the development of water resources, and the implementation of laws (Bhatt & Bhatt, 2017). Although the states receive funding from the central government, they primarily manage and develop their water resources using their own revenue. Recognizing the states' influential role in water governance, I contend the states play a crucial role in the quality of the water infrastructure and the distribution of water to their population. This is especially pivotal, during drought periods.

Based on the provided arguments, I will include water-related governance at the state level of the Indian government in my analysis. In the method section I will highlight what I understand under adequate or inadequate water governance. In so doing, I can identify potential political decisions to cope better with the water scarcity from a drought, in turn making political violence less likely to occur. Also, where I identify how governance is failing to address issues discussed in my thesis, this can be a potential vacuum for NGO's or communities to intervene.

Based on research conducted in South Africa (Masiangoako et al., 2022) I posit that protests arise as a primary reaction to governmental failures in managing water scarcity. The case studies in South Africa reveal how communities deprived of adequate water services, often turn to protests as a means to show their discontent. In particular when governance is

lacking in the provision of the communities' right for water, they tend to mobilize themselves and protest. Given that protests are characterized by grievances against government functioning, I expect this condition to be sufficient to result into protests, leading to the following hypothesis:

H1: When water-related governance is inadequate in drought-affected areas the likelihood of protests increases.

Next to protests I anticipate inadequate water-related governance also to contribute to more intense forms of political violence. When water governance is lacking it would also make riots and communal violence more likely in drought-affected areas, however, I assume this is not sufficient for these types of political violence

2.3.3 Water infrastructure

Second, I assert that the condition of regional water infrastructure is key to understanding the link between drought-induced water scarcity and political violence. According to several authors the provision of adequate access to clean water is one of the conditions making a population less vulnerable and better able to tolerate further resource scarcity, which makes instability and conflicts less likely (Brooks et al., 2005; Tol & Yohe, 2007). I contend this is indeed correct and that poor water infrastructure increases the chance of political violence.

Indeed, highlighting the importance of available water, Detges (2016) shows how poor water infrastructure makes political violence more likely in drought-affected areas. Specifically, communal conflicts (between separate ethnic groups) are more likely to occur in drought-affected areas with insufficient access to a water source. This study, therefore, indicates how water scarcity interacts with access to water sources and makes political violence more likely. Likewise, Cao et al. (2022) show more empirical evidence that this is the case; they tested how households' access to water, sanitation and electricity related to the probability of local conflicts in drought-prone regions. Their findings suggest that improved household access to water and sanitation enhances community resilience against becoming entangled in violent communal conflicts.

When there is a shortage of rainfall but people have access to alternative water sources, such as groundwater wells, they are more likely to cope with a drought. Presumably, because there is less competition for water. When water infrastructure is poor and there is

erratic rainfall, competition for water becomes more extensive, just as the likelihood for conflicts over water. Also, I argue that if people are in an imminent need for water, they are more likely to take risks in obtaining it. This means people are more willing to steal water from other communities, draw water from wells not belonging to them. Thus, poor water infrastructure makes communal violence more likely when an area is faced with a drought.

Next to communal violence, Sánchez and Rylance (2018) studied how water scarcity accompanied by insufficient distribution of water in North African countries are related social unrest. Social unrest in their study consisted of water-related riots or protests. The authors conclude that limited water distribution is a strong detriment of water-related protests and riots. Unequal distribution of water in times of scarcity of water increases the horizontal grievances according to the authors. Based on the aforementioned articles and in line with this argument, I conclude that poor water infrastructure increases the likelihood of political violence during periods of drought-induced water scarcity.

As I argue that water infrastructure is an important contextual factor linking water scarcity to political violence, I need to explain more about the water infrastructure in India. In India water availability is spatially unequally distributed. To illustrate, 71% of India's water resources are available for only 36% of India's land area due to the coverage of water basins in the country (Verma & Phansalkar, 2007). The water can theoretically be diverted to regions where demand is higher, however, this comes with obvious social, economic and legal considerations, which makes it a difficult manageable task for the Indian government.

Besides the geographical unequal distribution of water, there is also unequal distribution looking at social cleavages in society. The urban population has better access to water than the rural population, the main access point for the urban population to get water is piped water into their household, whereas for the rural population this is mainly tube wells or boreholes (International Institute for Population Sciences (IIPS) & ICF, 2021). Despite this difference, a big part of India's urban population still experiences difficulties obtaining adequate fresh water. According to Tirumala et al. (2020) no Indian city can provide water via the piped water systems all the time. For the rural population obtaining water often means walking distances to public water wells.

The disparities between access to water also pertains in other societal dimensions in India (Tirumala & Tiwari, 2022). People with a higher income more often have a piped water system to their household than people with a lower income. Furthermore, lower social classes stemming from the caste system in India also have less access to adequate water sources. Hence access to proper drinking water is not only dependable on the physical presence of

water in the region, it also depends on peoples' income level, social class, and location on the urban-rural continuum (Poonia & Punia, 2019).

Within this research, I examine how the state of the water infrastructure contributes to political violence in drought-affected areas. A population already experiencing relatively poor water infrastructure, is likely to become more frustrated when a drought exacerbates these water infrastructure deficiencies. Therefore, I expect riots to become more likely in drought-affected regions in India. Riots are more violent and destructive compared to protests and could emerge when there is intense frustration among the population. Besides the poor water infrastructure, inadequate water-related governance also contributes to the likelihood of riots. Leading to the following hypothesis:

H2: Inadequate water-related governance and substandard water infrastructure in drought-impacted areas increase the likelihood of riots.

Considering the likelihood for communal violence, I also expect this type of political violence to be more likely when water infrastructure is insufficient and water-related governance is inadequate. Communities with substandard water infrastructure are more likely to experience water scarcity from drought. When communities experience a shortage of water, either in absolute terms or especially in comparison to other communities, this disparity can lead to feelings of frustration and aggression (Fjelde & Ostby, 2010; Gurr, 1993; Kahl, 2006). Therefore, this is likely to facilitate recruitment for violence against other communities over water.

Nonetheless, I presume that inadequate water-related governance and substandard water infrastructure, even when present together, are not sufficient in themselves to lead to communal violence without the presence of water-related grievances. I argue that water-related grievances are the tipping point making communal violence more likely. In the next section, I will elaborate on this.

2.3.4 Water-related societal grievances

Finally, I anticipate that societal grievances related to water will act as a conditional factor for droughts leading to communal violence. As previously mentioned, literature on the climate change – conflict nexus suggests that a history of conflict increases the likelihood of renewed tensions (Cappelli et al., 2023). I contend that in regions with preexisting conflictual dynamics, climate-driven resource scarcity can exacerbate disputes due to intensified

competition for resources. In this study, I will thus focus only on preexisting conflictual dynamic that are water related.

Conflicts over water are intertwined in Indian society. According to Gujja et al. (2006) water conflicts have reached every segment of India society. It happens between political parties, between states, between farmers, or between castes. These conflicts can revolve around the distribution of river water, the construction of dams, or disputes over fisheries, among other examples. Conflicts over water arise mainly because there is contention between different users over how the same unit of water is used. I will focus on water conflicts at the micro-level, meaning within a city, neighborhood, or village between different end-users. According to Gujja et al. (2006) there are thousands of such cases in India.

To give an example of a case, in Rajasthan two villages (Dhar and Ghelotaon Ka Vaas) compete for surface water after the state government decided to implement a new drainage system modifying the flow of water (Gujja et al., 2006). As a result, one village receives less water. Therefore, this village receiving less water has resorted to its own measures to redirect more water towards itself. Such tensions between the villages resurface with any shift in water availability, illustrating that disputes over water allocation often stem from longstanding issues.

I contend that communal violence is often a result of unresolved historical water issues, where past grievances heighten the risk of renewed clashes, as noted by Cappelli et al. (2023). Compared to riots and protests, communal violence is typically more structured and therefore requires the presence of grievances for its occurrence. Furthermore, it represents a more severe form of political violence, marked by direct and potentially deadly confrontations between groups. Therefore, in drought-affected regions, preexisting water-related grievances are critical for understanding the development of communal violence

In regions with a conflictual history over water resources, scarcity during drought conditions is likely to reignite disputes. Such tensions have the potential to escalate into communal violence, particularly if the disputes are recent. This can be a conflictual history between for example, communities, villages, or neighborhoods. Together with the former mentioned conditions I expect water-related grievances to make communal violence more likely, leading to the following hypothesis:

H3: Inadequate water-related governance, substandard water infrastructure and water-related grievances in drought-impacted areas increase the likelihood of communal violence.

2.4 Causal mechanism

Based on the literature discussed above I have identified a causal mechanism I deem crucial in explaining how water scarcity from droughts cause political violence. I have depicted this relationship in Figure 1. On the left (Input) I depicted the droughts. A meteorological drought may induce water scarcity, this is also dependent on how water is governed and the quality of the water infrastructure. In the middle (Causal Mechanism) I represented the variables increasing the likelihood of the different forms of political violence, these are water-related governance, water infrastructure, and water-related societal grievances. On the right of the diagram (Outcome) one can see the categories of the dependent variable political violence. It is divided into three distinct categories: protests, riots, and communal violence. Among these, protests represent the least conflictual form, while communal violence stands as the most severe and conflictual expression of political violence.

A meteorological drought is characterized by a lack of rainfall. This may induce regional water scarcity in the affected region. I assert that water shortages from a lack of rainfall depends on the quality of the water governance and water infrastructure in India. When there is inadequate water-related governance in a drought-affected state, water shortage becomes a more imminent problem. Given that protests are characterized by grievances against government functioning, I expect inadequate water governance to increase to likelihood of protests in drought-affected areas (H1).

Furthermore, the presence of inadequate water governance and substandard water infrastructure in a drought-affected area heightens the risk of riots (H2). Riots represent a more intense form of political violence than protests, often stemming from intense societal frustration (Waddington et al., 1989). In regions with already deficient water infrastructure, a drought can enhance these inadequacies, creating more distress and unrest among the affected population. Consequently, in areas of India affected by drought, I anticipate an escalation to riots, which are characteristically more violent and destructive than protests.

Finally, I anticipate that communal violence is the most intense form of political violence in my study. Inadequate water governance and substandard water infrastructure are both necessary for communal violence to occur, however, this is not sufficient. When these conditions are coupled with water-related grievances this increases the chance of communal violence (H3). In regions with a conflictual history over water resources, scarcity during drought conditions is likely to reignite disputes. Additionally, in line with the argument of Raleigh (2010); government response to such water crises may vary by group status, with

marginalized communities often receiving less support, potentially leading to greater strife and communal violence.

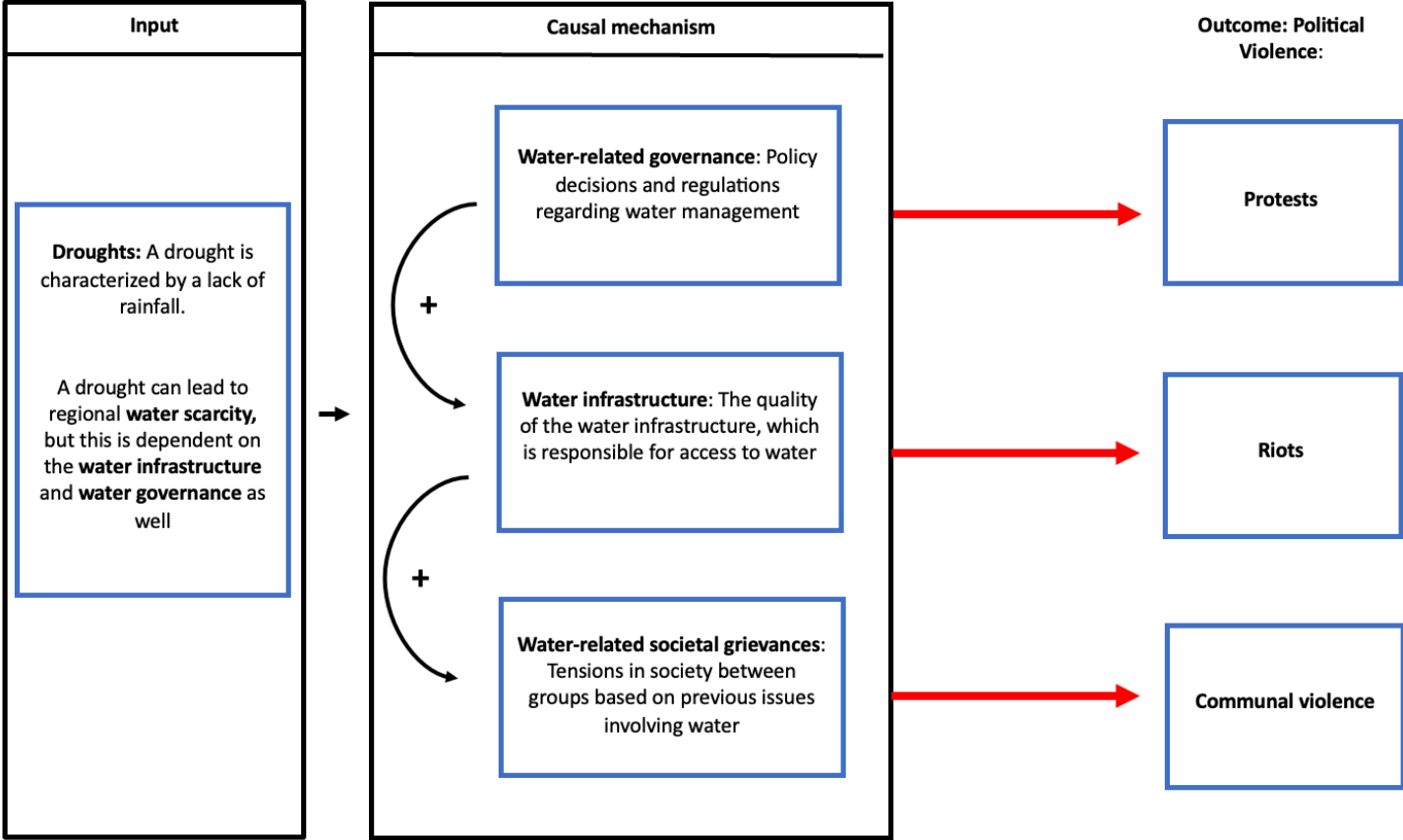


Figure 1: Causal mechanism for how a drought leads to political violence

Chapter 3: Method

In this section I will first elaborate on the research method I will be using and how this method contributes to the existing literature. Second, I will explain why I choose to study droughts in the timeframe of 2002-2019 in India. Third, I will specify the variables I use in this thesis. In so doing, I will give a working definition for these variables and I describe the operationalization. Lastly, I will convey what data I will use and elaborate why I view this data is valid and valuable for my research.

3.1 Research method

I have chosen to perform a single-case study (Gerring, 2016), which consists of a timespan in India where major droughts occurred. This method can be used to gain in-depth knowledge and to examine the mechanisms in play. This way I can find out how droughts in this timeframe have led to political violence in India. I will be using qualitative data for my analysis.

There is no single definition for what a case study entails. However, in line with Gustafsson (2017) it can be defined as: "An intensive study about a person, a group of people or a unit, which is aimed to generalize over several units" (p. 2). Further, a case study method uses different sources of data collection for information and gathers information concerning the case over time. It can be seen as a flexible method as there is no standardized approach in doing a case study (Merriam & Tisdell, 2015). Nevertheless, a case study should be chronological, meaning that one finding leads to another. Findings should, therefore, not be randomly portrayed.

I consider it prudent to perform a case study about this topic, because this allows me to pay attention to the context of where the droughts occurred. The literature indicates that the political context of where a natural hazard takes places is relevant for explaining how it led to conflicts (Von Uexkull et al., 2016).

3.1.1 Process-tracing

My thesis will use process-tracing as method to test the causal mechanism described in chapter 2. Process-tracing is a method where one can look further than just a correlation between independent variable X and dependent variable Y (Beach & Pedersen, 2019). Using process-tracing one is attempting to identify the causal process between X and Y. Hence it traces the causal mechanism. In so doing, the researcher is able to make a strong within-case

inference about the causal process. There are three different variants of process-tracing: theory-testing, theory-building, and explaining-outcome.

The different types of process-tracing have different purposes and different ways to study causal processes. Theory-testing process-tracing is used to test the validity of an existing theory and examines whether the causal mechanisms a theory predicts can be found in a particular case. Doing theory-building process-tracing, one would develop new theories. This variant typically involves no theoretical framework and aims to identify new causal mechanisms, which can explain the outcome. Lastly, explaining-outcome process-tracing is used when one wants to understand a specific outcome in a particular case. Hence this is more about getting detailed information of the case itself.

In the analysis, I will adopt theory-testing process-tracing to examine the nexus between droughts and political violence in India, which is based on established literature on the subject. Given the existing body of research and the plausible causal mechanism I have derived to explain the outcomes in India, this approach is particularly useful for addressing my research question. It will enable me to make a sophisticated examination of the hypothesized links between droughts and political violence within India's sociopolitical landscape.

Theory-testing process-tracing is the practice of first identifying a causal mechanism explaining the correlation between X and Y and testing this in a single-case (Beach & Pedersen, 2019). In my case the correlation is between droughts (X) and political violence (Y). The causal mechanism is based on existing literature. I have described my causal mechanism in chapter 2 (Figure 1). On the basis of this mechanism the researcher tests whether each part of the mechanism is shown in a particular case. Hence, I will test whether there is evidence of each part of the described mechanism in India for the different categories of political violence. This way I identify whether the proposed mechanism is functioning in India, and what parts of the causal chain is present. Importantly, however, this does not exclude other possible mechanisms explaining the connection between droughts and conflicts. Other possible mechanisms can still be present in the case.

Process-tracing is different from other small-*n* case studies, because it only makes within-case inferences, whereas most other small-*n* methods compare across cases (Beach & Pedersen, 2019). The goal is to empirically validate my identified mechanism in the Indian context. In order to do this, I will test whether empirical evidence strengthens or weakens the mechanism.

3.2 Case selection

First of all, I chose to study the effects of droughts in India, because India can be seen as a typical case (Gerring, 2016). A case is typical when it encompasses a typical set of characteristics of the phenomenon that is researched. In my study, a typical case would be a state which is typical to be studied in the drought – conflict literature. In the following I will explain why India can be seen as a typical case.

India is often faced with periods of droughts due to the highly variable monsoon rainfall (Pal & Al-Tabbaa, 2011). This variability results in meteorological droughts over large parts of the country. Like many countries studied in relation to the drought – conflict link, India is classified as a developing country (The World Bank, 2024). Consequently, the state's institutions are not fully equipped yet to deal with the challenges of climate change. Inability of institutions to deal effectively with the impact of a drought often leads to greater sociopolitical impacts, making such countries a common focus of research.

Furthermore, India's agriculture is to a large extent rain-fed (Panda, 2016; Shukla & Huang, 2016), and the economy is still significantly dependent on agricultural output. This is similar as many countries in Africa frequently affected by droughts. These countries are often studied because of the direct impact of droughts on agriculture and the consequential economic issues. Based on these factors, I argue India to be a typical case for studying the effects of droughts, possessing a representative set of characteristics.

However, concerning the generalizability of my findings, there is a tension between the fact that I chose a typical case and my used method. To clarify, the disadvantage of process-tracing is its generalizability. The inferences made in this thesis are within-case inferences, therefore, the exact empirical findings cannot be generalized across a population of cases. Nonetheless, I deem this as a useful research method for my thesis as this allows for testing the identified causal mechanism in a specific context.

While the empirical findings from India may not be universally applicable, the underlying mechanism and its broader implications could apply to countries with sociopolitical contexts similar to India's. The empirical findings how the mechanism exactly works in the Indian context cannot be generalized. Yet, when this mechanism – characterized by inadequate water governance, deficient water infrastructure, and water-related grievances – is observed in India, it suggests potential applicability in comparable situations elsewhere

3.2.1 Time period

It is important to note that droughts in India are variable in time and space. This means that one part of India can be affected with a severe drought whereas another part of India is not affected at all. Also, a year later this could be the other way around. Due to these circumstances, it does not happen very frequently that India as a country has been declared in a state of emergency due to a major drought. However, it does happen frequently that districts or states of the country are officially declared to be impacted by a drought. Based on this, I have chosen to study a timeframe in which it has been shown that India experienced major droughts impacting large parts of the country.

The timeframe of 2002-2018 was selected for this study as it includes significant drought periods in India, specifically in 2002 (Shah & Mishra, 2020), 2009 (Kumar, 2023), and the prolonged drought from 2015 to 2018 (Mishra, 2020). The EM-DAT database, which records natural disasters globally and is maintained by D. Guha-Sapir (2000-2023), also lists these droughts, providing a comprehensive overview of such events from 1900 to the present, including the smaller scale drought of 2018.

Furthermore, NGO reports describing the major drought of 2015-2018, for example, already indicate the impact it had on water insecurity (Sevekari, 2016; United Nations Office for Disaster Risk Reduction, 2021). Thereby this consecutive drought has been disruptive for the population of India and its socio-economic well-being (Mishra & Aadhar, 2021). A similar case can be made for the major drought of 2002-2003 (Gaur et al., 2008; Mishra & Aadhar, 2021).

Additionally, there are indeed a lot of news reports indicating that droughts in this timeframe led to political violence in India (See for example: Niazi, 2016; Wu, 2017)). Importantly, I will not assess the whole of India evenly, as some states are more vulnerable to droughts and have been impacted more severe than others. In assessing how droughts led to political violence, I will mainly focus on these areas and test whether this is in line with my theoretical assumptions of chapter 2.

3.3 Variables

In this section I will describe the variables that come from the literature presented in chapter 2. For each variable I will first introduce the working definition, thereafter I will explain the operationalization of the variable. Two variables in my study are environmental conditions, which are conditions that are kept constant across the cases. The variables droughts and water scarcity are environmental conditions, as in each case in my analysis a

drought and water scarcity will be present. The independent variables in my thesis are: water-related governance, water-related societal grievances, and water infrastructure. The dependent variable in my analysis is political violence, consisting of 3 subcategories (protests, riots, and communal violence).

3.3.1 Droughts

A drought period in my thesis is defined as a period with erratic precipitation significantly below normal standards, which results in critical water-levels in the affected regions, thereby influencing land resource production systems. The definition is derived from Sarbahi and Koren (2021, p. 4) and is in the literature often referred to as a meteorological drought (Bhardwaj et al., 2020). I will identify whether an area is affected by a drought based on the database from EM-DAT (D. Guha-Sapir, 2000-2023), academic literature and newspaper articles. I will only consider a drought if it involves erratic precipitation that disrupts the area's available water resources.

In considering what sources are most valid in identifying droughts, there are possible better sources than academic literature, newspapers or the EM-DAT database. Researchers in the field often use georeferenced meteorological data and use benchmarks for droughts to indicate where and when an area experienced a drought. Based on different statistical analysis these researchers conclude whether an area experienced a drought. Since I do not have the expertise in this meteorological profession and I am not equipped to transform meteorological data to drought indices, I have chosen not to use this strategy. In other words, transforming georeferenced meteorological data to drought indices was beyond the masterthesis I conducted.

Nevertheless, I consider using academic articles, newspaper articles and the database of EM-DAT as a valid alternative. I chose to use these sources as EM-DAT is a widely used reliable database on natural disasters. However, the droughts identified by EM-DAT is not based on precipitation data. Therefore, I validate the droughts based on academic articles using rainfall-data in line with my definition of droughts. Additionally, academic articles can give an indication of the impact of certain droughts on water scarcity in the affected region. Lastly, newspaper articles and NGO-reports will be used to validate the drought in the given area.

3.3.2 Water scarcity

A period of erratic rainfall can naturally lead to losses of water in a specific area. This decline in available water impacts livelihood of people in diverse ways. One can think about a lack of drinkwater, water for sanitation, or water for crops. I conceptualize water scarcity as a decline in water mass in a region, which is the result of a period of drought in the affected area. Specifically, water scarcity refers to scarcity of available fresh water for households, the industry and agriculture. It does not include access facilities to water.

Water scarcity can also become a problem due to other reasons besides a drought, such as via increased population growth, or political decisions about water dispersion in the region. In my thesis I will only look at water scarcity which can be linked to an identified meteorological drought. Other factors contributing to the water scarcity (if present) are described in my analysis as well, however, it should be clear that the water scarcity in an identified case is at least (partly) triggered by a meteorological drought. This will be done by using newspaper articles and NGO-reports that describe the droughts and link this to the scarcity of water. When different sources describe a shortage of water in the drought-affected area, I conclude that the drought caused water scarcity problems.

3.3.3 Water-related governance

The definition for water-related governance is derived from Pahl-Wostl (2017). The author defines water governance as “the social function that regulates development and management of water resources and provisions of water services at different levels of society and guiding the resource towards a desirable state and away from an undesirable state” (p. 2921). Specifically, in my thesis water governance relates to policy decision regarding water management at the state-level of the Indian government. Hence, it recognizes the state government’s role in the distribution of water as described in the constitution (Pandit & Biswas, 2019). It not only concerns distribution of water, but also investments in water infrastructure and the implementation of water infrastructure. It can also be policy decisions before the drought itself occurred, since policy decision before the drought can become influential when a drought actually occurs. In other words, the decisions become part of my mechanism when water scarcity from a drought takes place.

To find evidence for inadequate water-related governance, I will assess whether the subnational government adheres to best practices in successful water governance. This could have been decisions before the drought or measures to provide relief from the drought. The argument is that when the state government addressed water needs prior to drought or more

effectively during the drought, this would not have led to political violence. Sources I will use for this are academic articles and reports from governmental bodies. I will go in depth of each case and find out how water is governed and what are the differences between the drought-affected states.

Based on the identified core components of water governance identified by Jiménez et al. (2020), I conceive measures taken by the state government inadequate concerning water management when, for example:

- There is a lack of policies, laws or regulation.
- There are coordination problems between different water management bodies within the state.
- Failure to enforce laws or regulation.
- Lack of inclusiveness or representation in decision-making.
- Absence or shortage of investments in water infrastructure.

3.3.4 Water-related societal grievances

Based on my theory, I theorize that water-related societal grievances increase the likelihood of political violence in drought-affected area. These grievances must have surfaced before the drought and political violence occurred. I define water-related societal grievances as issues that have arisen within societies due to management, distribution, accessibility or quality of water. Examples of the issues are:

- The struggle for a construction of a water well.
- A struggle between communities over access to a water source.
- Contamination of river water by one village affecting the quality of water for other villages.
- Overextraction of groundwater impeding available water to communities.

In order to establish whether there are preexisting water-related grievances, I will trace the actors involved in the act of political violence and determine whether a water-related issue preceded to political violence. When the political violence stems from dissatisfaction with the government, my analysis specifically targets water-related issues involving the government. I will limit the investigation of preexisting water-related grievances to five years before the specific drought occurred when the violence took place. This approach is to ensure that the

grievances are recent enough to remain relevant and continue to influence people's perceptions.

3.3.5 Water infrastructure

The water infrastructure is defined as all the physical systems and structures necessary to store, treat, and transport water to the end-users. The end-users can be households, the agriculture or the industry of India. There are a few components relevant of India's water infrastructure that I will assess in this thesis. I will only assess this when it is relevant to the geographical area faced by a drought.

Specifically, my research will cover various aspects of water infrastructure, which includes reservoirs, wells, and dams that are integral to sourcing and storing water. Additionally, it will examine the pipelines and related structures responsible for transporting water to end-users, as well as the systems utilized in agriculture for delivering water to crops. For each case I will determine the state of the water infrastructure.

In order to find evidence for poor water infrastructure I rely on academic articles, reports and newspaper articles about the drought-affected area. The reports can come from governmental bodies, NGOs, or other organizations involved in water management. The newspaper articles should cover the subject of water infrastructure in the affected region. This way I can determine the state of the water infrastructure. Examples for when water infrastructure is considered poor is when:

- A large part of the drought-affected population has no access to piped water on their premises.
- People have to walk large distances to get access to water.
- There are inefficient irrigation systems.
- There are not enough storage opportunities in the affected region.
- There are unequal opportunities among Indian residents to have access to water.

As pointed out in chapter 2, in India, the state of the water infrastructure is relatively better in urban areas compared to rural regions (International Institute for Population Sciences (IIPS) & ICF, 2021). It is still possible for residents in Indian cities to experience worse water access compared to other Indian residents living in the city, however, I assume that this is better than the water infrastructure in rural India. I contend this based on the paper of Tiwari (2018), where it is explicitly detailed how rural India has impoverished water infrastructure

compared to urban India. People in rural India have to walk miles for water, whereas in urban areas people's access to water is much closer and they often have water from the tap. Frequently, villages in rural India do not have a water connection at all. Consequently, when considering instances of political violence in India, I assume that water infrastructure is more inadequate in rural areas than in urban ones. I will validate this based on the case and the specific location in India, enabling me to compare rural and urban water infrastructure.

3.3.6 Political violence

The dependent variable in my thesis is political violence. It is an ordinal categorical variable. Meaning that it consists of three categories, where each step up on the scale is a higher level of political violence. The lowest category is protests, one level higher is riots, and the highest level is communal violence.

The working definition for political violence adopted in my thesis is a combination of the definition for political unrest defined by Ide, Kristensen, et al. (2020) and communal violence defined by Horowitz (2000). Consequently, I define political violence in my thesis as localized manifestations of social discord, encompassing both political unrest and communal violence. Political unrest, which includes riots and protests, can take the form of either violent or nonviolent demonstrations driven by political causes. These causes include demands for or opposition against specific forms of governance. Communal violence relates to violence between groups defined by their identity characteristics, which include race, ethnicity, nationality. The dependent variable is restricted to a localized level, it does not involve the entire country, rather it is within a city, village, or specific area within a state.

As such, I conceive protests to be the lowest form of political violence. In line with my hypothesis the presence of inadequate water-related governance is sufficient to lead to protests. This type of political violence consists of people marching the streets, partitioning, boycotts, strikes or sit-ins. It is disruptive for society; however, it does not involve casualties or people getting hurt. One can see this as the most legitimate way to show discontent.

Furthermore, I operationalized riots to be a more intense form of political violence. The presence of inadequate water-related governance and substandard water infrastructure is sufficient to lead to riots. This type of political violence typically includes more people and includes acts of violence and property damage. Examples of these behaviors are: street clashes between people and/or the police, vandalism, looting, barricading and use of weapons.

Lastly, communal violence is considered the most intense form of political violence. It refers to clashes between different groups and involves deliberate acts of violence by

members of one group against the other. I infer that communal violence occurs when suboptimal water governance and water infrastructure is present coupled with water-related grievances. The violence can result in injuries, destruction of property or loss of lives.

Newspaper articles will be used to find conflicts in drought-affected areas. Key terms I will use to find those articles will be: “protests”, “communal violence”, “communal conflicts”, “water disputes”, “demonstrations”, “riots”. Also, I will include terms that would ensure these articles come from drought-affected areas. In addition, a database I will use is the Water Conflict Chronology Database (Pacific Institute, 2022) to find cases of conflicts over water, which could be traced down to droughts. This database uses openly available databases for conflicts and includes conflicts which are related to or involve fresh water. It is not exhaustive as some water conflicts may be kept unreported or not included yet. However, this extensive database is considered valuable for analyzing the timing and location of water disputes in India, particularly those attributable to droughts. From this database I will trace the original source and use this for my analysis.

3.4 Data

As described in the earlier sections, for the analysis I will use data from primary and secondary sources. The steps I will take in my analysis will proceed as follows. First, I determine when and where the drought occurred. Next, I assess whether it led to water shortages. I then investigate whether political violence occurred in the affected area. When I find a case, I examine the water governance of the relevant subnational government and assess the condition of the water infrastructure involved. Finally, I make the connection with water-related grievances.

To choose my study cases, I will look for when and where political unrest happened in India from 2002 to 2018, during droughts. I will ensure these events were clearly linked to problems with water shortage. This method makes sense, because this way I can specifically find cases of political violence in drought-affected areas. Moreover, by not limiting the search to particular regions within India, but only to those affected by drought, the study encompasses a broad spectrum of scenarios where water shortages may have triggered political unrest. Next, I will outline the specific sources from which I will gather my data, along with the rationale behind selecting these types of sources.

To find news reports I will be using the search engines Google and Nexis Uni. Nexis Uni is an online database of news articles from newspapers around the world. It contains local, national and international newspapers from approximately 1990 till now. The NGO-

reports will come from the databases of The United Nations (UN), UNICEF and Human Rights Watch. I will search these databases for findings regarding droughts in India within the timeframe of my research question. I use Google Scholar and Web of Science to find relevant academic articles.

As one can read, I have chosen to use newspaper articles extensively to find evidence for my causal mechanism. The advantage of this is that news reports are easily accessible, it captures events as they happen, and it is useful to identify public sentiment. Also, political violence might be underreported in, for instance, databases or academic papers. Newspaper articles are more likely to cover these events.

On the other hand, newspaper articles can be biased related to the publisher of the article and the veracity of newspaper articles can be uncertain. To deal with these issues, I will use multiple sources to verify the certainty of findings. Another disadvantage of my data collection will inevitably be that I can only use English news reports. Therefore, local news reports from India which are written in another language than English are not included in my analysis.

The use of academic articles makes my findings more reliable. Academic articles are peer reviewed, which makes them more accurate. Also, academic articles report how they have come to their findings. This gives me the possibility to assess the validity of the findings.

Lastly, NGO reports have the advantage of operating independent from the government. This gives a different view of the situation compared to reports from governmental bodies. Moreover, NGOs often have the possibility to reach parts of the population which are not easily reached. Such as marginalized or vulnerable people in India's society.

Chapter 4: Analysis

In this chapter I will first give some context about droughts in India. In so doing, I will portray a short historic overview of extreme droughts in India. Afterwards, I will describe the findings from my analysis regarding major droughts in the timespan of 2002 until 2019.

4.1 History of droughts in India

India has been facing droughts for a long time already. There are records of the past where India's population was devastated due to droughts and the subsequent famines (Shew, 2016). For instance, the Great Bengal Famine (1769-1770) resulted in approximately 10 million deaths (Raychaudhuri et al., 1983), or the Chalisa Famine, which occurred in the northern and eastern states (1780s) took the lives of approximately 11 million people (Grove, 2006). In time, the Indian agriculture changed and adapted to become more resilient to droughts. Farmers would have a diversity of crops, this way they also had some spare crops when the area was affected by a drought. Hence, they were less prone to the possible adversities during a drought.

However, when the British colonized India, they obligated the farmers to produce a certain level of only rain-fed crops (Shew, 2016). During times of droughts the farmers would not produce enough and would not be able to pay the taxes of the British Empire anymore. As a result of this British policy, farmers were becoming extremely poor and starved when they had to face a drought (Shew, 2016). This highlights the importance of the political context in which droughts occur.

Although, India has not faced any severe famine with millions of lives being lost since independence, the threat of droughts remains an issue for contemporary India. This is especially the case, because of the worsening of the climatic circumstances in India. For instance, Dai (2011) shows there is a drying trend over the whole South Asian sub-continent. In addition, Singh and Ranade (2010) conclude that dry areas in India are getting dryer and wet places are getting wetter. Lastly, Sontakke et al. (2008) studied the precipitation over India and found a 68% decrease of rainfall, which is mostly due to less monsoon rain-fall. Hence, these studies indicate that drought periods have become more frequent recently, and this trend will continue in the near future.

India's agricultural is strongly dependent on the Southwest Monsoon rain, as this rainfall is accountable for 70-90% of the annual precipitation in India (Shukla & Huang, 2016). The period of the Southwest Monsoon is during the months June till September in the

summer. This monsoon rainfall has spatial and temporal variability, meaning that the amount of rainfall changes on a daily bases and is differential per region in India. High summer monsoon rainfall is mostly in the southwest coast and northeast regions, whereas the northwest and southeast regions experience the least summer monsoon rainfall (Hrudya et al., 2021). In the following sections I will describe droughts in the period 2002-2019 and how it impacted India and led to small-scale conflicts.

4.2 Drought of 2002

In the years 2002-2003 India experienced a major drought with parched water sources as a main issue (Venkaiah et al., 2015). The states: Andhra Pradesh, Karnataka, Tamil Nadu, Madhya Pradesh, Maharashtra, Rajasthan, Gujarat, Chhattisgarh and Odisha were officially declared to be affected by a drought by the Indian Government. These listed states stretch across southern, central, and western India. The drought has also been reported in the database of EM-DAT, and the official cause is erratic rainfall during the monsoon season.

Water scarcity was a direct consequence of the erratic rainfall. There are several indicators demonstrating that the meteorological drought influenced water availability in India (Samra, 2004). Water storage levels and groundwater levels were significantly less than average, and during the drought, each day, more than 1.5 billion liters of drinking water was transported in India. Indicating the need to distribute water across the country to areas affected by the drought.

4.2.1 Case 1: Farmer riots in Karnataka

Karnataka is a state in the southwestern region of India, it is the sixth-largest state by area and it has around 61 million inhabitants. Officially, Karnataka was not declared to be drought-hit by the national government in 2002. However, news reports and academic studies examining precipitation in Karnataka do indicate the state was facing a drought in 2002 (Biradar & Sridhar, 2009; Rao et al., 2005). During this drought, riots erupted in Karnataka following a dispute with Tamil Nadu over the allocation of water from the Cauvery River (Ghosh, 2002; "Water row sparks clashes in India," 2002). The Supreme Court decided that Karnataka needed to release water to Tamil Nadu for irrigation purposes. When the state government adhered to the court's ruling, riots erupted in Karnataka. The farmers themselves experienced water scarcity from the erratic monsoon rainfall. Hence, they were discontent with the fact that their state's government decided to release more water to Tamil Nadu. Since

the riots were initiated by farmers of Karnataka, I classify this case as a rural case pertaining the water infrastructure of rural Karnataka.

During the drought of 2002 multiple incidences of rioting were reported within Karnataka. While most news outlets characterized the incidents as protests, I classify them as riots based on the operationalization of my dependent variable. Based on evidence of the use of violence and the destruction of property I came to this conclusion. For instance, from the news reports it becomes clear that farmers fought the police, blocked roads, attacked a train, burned government vehicles, stormed water reservoirs, and started fires ("Farmers protest before AIR office on Cauvery water issue," 2002; Ghosh, 2002; "Police arrest 40 farmers as Indian water row boils," 2002; "Protests resume in India over water row following court order," 2002; Shankar, 2002). This is sufficient evidence, in my view, to classify the incidents as riots.

To give some background information; the dispute between the two states concerning water distribution of the Cauvery River has a long history and is still ongoing. The Cauvery River is one of the main rivers of India starting in Karnataka and ending in Tamil Nadu and is fed mainly by rainwater. The river is extensively used for agriculture. Different agreements between the two states have been made in the past, together with rulings of the Supreme Court. Nonetheless, this has not solved the dispute between the states, and problems keep recurring when a drought affects both states.

Water governance in Karnataka. Although the initial stressor of the riots described by the newspaper articles is the decision of Karnataka's government to release more water to Tamil Nadu. I do not view this as inadequate governance, as it was obliged to do so by the Supreme Court. Nevertheless, after looking more in-depth into the water governance of Karnataka, I do see shortcomings which could have alleviated the water scarcity among farmers. Thereby decreasing the likelihood of riots when the state government has to make difficult decisions during a significant shortage of rainfall.

Karnataka is one of the most drought-prone states of India (Khanduri et al., 2016), the state receives highly irregular rainfall and experiences deficient rainfall years frequently. It can be seen as one of the most water scarce states of India. Due to its vulnerability to droughts, the state invested greatly in water storage infrastructure. Additionally, past investments in water storage were also done so the state received its fair share of the interstate rivers' water. This has positioned Karnataka as one of the leading states in terms of water storage capacity.

Despite the investments in storing water, there is a lack of investments in diverting water. According to a review of the Karnataka's State Water Policy (Khanduri et al., 2016) the state government should reallocate more investments in irrigation. Specifically, more investments are needed in canals and field channels to divert water from the rivers and storage facilities to farmers in Karnataka. The lack of these investments naturally contributed to the water scarcity the farmers experienced during the drought of 2002.

One way to alleviate the issue described above would be to implement Participatory Irrigation Management (PIM). In so doing, farmers are encouraged in the management and the development of the irrigation projects. Specifically, the state government then gives more responsibility to farmer groups in constructing field channels to their lands. This could benefit Karnataka, because there is a gap between the utilization of created irrigation potential as well (Government of Karnataka, Water Resource Department [GKWRD], 2002). Meaning that there is more need for the construction of smaller channels to the farmlands from the larger canals. According to Khanduri et al. (2016) Karnataka began formalizing farmer involvement in irrigation management in the 1980s, however true participatory management has yet to be fully established, presenting a significant policy challenge.

Another reported deficit of water governance during the 2002 drought in Karnataka, concerns the coordination issues between the different department responsible for water resources (Khanduri et al., 2016). For instance, there is no institutional arrangement or system at the state level, which is responsible for organizing and balancing the division of water between sectors within Karnataka. As a result, no overarching institution is there to assess the demands of the different sectors. When this is lacking, some sectors could receive a relatively large share of water, whereas other sectors are in more need for water. This naturally causes a lack of efficiency in balancing water between sectors and is likely to incur misbalance between the different sectors.

When it becomes clear that the agricultural sector in Karnataka needs more water, due to a lack of precipitation, good coordination between the various water departments is crucial in alleviating this need. In all likelihood, this deficit of water governance in Karnataka has contributed to agricultural problems for the farmers during the drought. In case of an adequate central institutional framework, which coordinates water between all the sectors, the response to droughts is presumably more rapid and effective. This would support in preventing water shortage in the agricultural section, making farmers less frustrated.

Based on the above findings, I conclude that water governance is inadequate in Karnataka. This especially impacts agriculture, due to the lack of irrigation investments. A

lack of policy to encourage PIM makes it even more difficult to alleviate this issue. Lastly, the lack of an institutional arrangement is problematic in a drought-prone state as Karnataka.

Infrastructure deficits in Karnataka. Since the riots were instigated by farmers, I will delve into the state of the water infrastructure of rural Karnataka. Comparing rural to urban areas in Karnataka there is a discrepancy in water infrastructure (Maria & Sastry, 2004). Looking at data in the decade before the drought (1991-2001), it was shown how provision of water supply and sanitation is still significantly better in urban areas compared to rural areas (Rajasekhar et al., n.d.). A large part of the rural population is still without the access to an adequate and safe supply of drinking water, and sanitation facilities are even worse.

Next to water for domestic use, water infrastructure for agricultural purposes is evidently lacking as well. There are low irrigation rates in rural Karnataka (Khanduri et al., 2016), and as referred to earlier, there is a lack of integration between irrigation services available and the agricultural need for irrigation. Additionally, there is unequal distribution of water. Farmers at the head of the Cauvery River stream use water excessively, resulting in lack of water for farmer at the tail of the river. Evidently, improved irrigation to agricultural land and fair distribution would help farmers in their distress for water.

At the same time, farmers in Karnataka should shift in their irrigation methods, which is the system farmers use to water their crops. There are different methods in doing this. In Karnataka there is a prevalence of flood irrigation systems (Mruthyunjaya, 2023). Flood irrigation is a category of flow irrigation methods, where the source of water is at a higher level and gravity ensures it is delivered to the crops. The water is delivered to the crops via canals, ditches or pipes. It is simply poured on the soil surface to saturate the ground. Flood irrigation typically involves covering an entire field with water, so the water “floods” the soil. This traditional way of watering crops uses water inefficiently, because it is less controlled leading to excess water runoff and more water loss due to evaporation of water.

To overcome the loss of water, the state government indeed planned to stimulate farmers to adopt drip and sprinkler irrigation in its water policy plan introduced in 2002 (GKWRD, 2002). This acknowledgement recognizes the need for more efficient use of water by the farmers in Karnataka. Indeed Jain et al. (2019) demonstrate in their study in India how modern irrigation methods, such as drip and sprinkler irrigation systems, are significantly more water-efficient than traditional methods. Both of these methods are more efficient in water use; drip irrigation ensures that water is directly delivered to the base of the plant, and

sprinkler spray water into the air, so that it breaks into smaller drops. I value both of these methods as pivotal in improving water use in rural Karnataka.

Finally, the extraction of groundwater by the state should be done more cautiously. Due to overextraction of groundwater large investments made by individual farmers in Karnataka on the construction of wells, pipelines, and other water developments have become useless (GKWRD, 2002). As there is a deficiency of water for drinking, agricultural and industrial use in dry taluks of North and South interior Karnataka, it seems prudent for the government to implement comprehensive water management strategies that involve regulated groundwater extraction, investment in water conservation technologies, and support for farmers to adapt more sustainable irrigation practices to mitigate the negative impacts on water resources and livelihoods.

To summarize, the water infrastructure in rural Karnataka is significantly less developed compared to urban areas within the state. There is a lack of agricultural irrigation networks. The irrigation methods used to water crops is predominantly done in traditional water-inefficient ways by the farmers. Also, overextraction of groundwater affects farmers negatively in their need for water.

Water-related grievances among farmers in Karnataka. The farmer riots erupted in September 2002 when the state government decided to release water to Tamil Nadu. To determine if there were preexisting grievances against the state government before the 2002 drought, I conducted a search on the Nexis Uni database for any recorded water-related disputes involving the Karnataka state government and local farmers over the five years prior to 2002.

No conclusive evidence was found establishing existing water-grievances between farmers in Karnataka and the state government. Although the dispute over the distribution of the Cauvery River water had flared up a few times between the state governments, consequential decisions did not lead to farmers expressing their frustration these times (See for instance: "Cauvery awaits final response: India/legislation," 1998).

Summary of key findings. The riots in Karnataka were instigated by farmers in a reaction to the state adhering to the ruling of the Supreme Court to release water to Tamil Nadu. Farmers in rural Karnataka experienced shortage of water for their farmlands. The poor water governance and the underdeveloped state of the rural water infrastructure contributed to the experienced water shortage. In other words, the drought amplified the issues concerning

water governance and the state of the water infrastructure. No evidence of preexisting water grievances was found.

4.3 Drought 2015-2018

In my assessment, the period of 2015-2018 is characterized as an extended drought in India. This is supported by the UNICEF report (Sevekari, 2016), which details the significant drought of 2015-2016, corroborated by EM-DAT data (D. Guha-Sapir, 2000-2023), and further extended by Mishra's (2020) study. The drought's longevity, rather than its intensity, marks its significance, with lasting impacts on water availability and socio-economic conditions. Although only Karnataka and Maharashtra were officially recognized as drought-hit by EM-DAT in 2018 based on precipitation levels, these declarations did not consider the cumulative impact of groundwater depletion from previous drought years. (Mishra, 2020). This oversight suggests that the actual impact was more widespread, underscoring the need for a comprehensive understanding of drought and its long-term implications on affected regions.

For one thing, the drought led to water insecurity in India (Sevekari, 2016). Water sources were partly dried up due to water use for irrigating crops of the farmers. In several states water quality worsened as well. Furthermore, the water problems also led to issues with sanitation. Open defecation increased in the rural villages and women reported to not take care of their personal hygiene anymore. Moreover, the water scarcity led to increased problems for the socially discriminated population living in the suburbs. They experienced unequal access to water sources. Below, I will portray three cases of political violence in three different states, which were affected by this extended drought period.

4.3.1 Case 2: Communal violence in Madhya Pradesh

In Madhya Pradesh the water-scarcity from the consecutive drought years were so imminent, that for several districts water could only be used as drinking water (Niazi, 2016). Madhya Pradesh is a state in central India, it is the second largest state by area with more than 72 million residents. The density of this population is comparatively low, as the inhabitants are largely spread across the state. Despite being the tenth-largest economy, Madhya Pradesh ranks 31st out of the total 34 states/union territories on the Human Development Index (HDI), indicating that the economic benefits do not profit everyone equally (Global Data Lab, 2021).

During the drought, people were doing what they could to get access to water, however, violence often broke out due to water scarcity in the villages. One of these issues

occurred in the Shivpuri district, in northern Madhya Pradesh ("Water clash leaves three hurt in Shivpuri, six booked," 2016). This incident of communal violence inflamed when a member of the Rawat Rajput community was transporting water on his bicycle and collided with a member of the Goswami community. Due to the clash water was spilled. It led to a heated exchange between the communities eventually attacking each other with weapons. Two women and a child were injured and six people were booked by the police. This incidence is classified as communal violence in line with my operationalization of communal violence. Additionally, this case occurred in a village in the rural area of Shivpuri district, hence I focus on the water infrastructure of rural Madhya Pradesh in this case.

Water Governance in Madhya Pradesh. One of the issues in water governance in Madhya Pradesh pertain issues with coordination and communication between the departments responsible for different purposes of water (Das, 2012). Finance for water projects get held up due to these governance issues. In addition, different departments use different norms in assessing the availability of water. Consequently, comparative analysis is impossible. Even worse, this leads to wrong interpretations between the departments considering what the root causes are of water issues, making wrong policy decision unavoidable. Thus, there seems to be a lack of a holistic approach, meaning that departments operate more or less independently from each other.

Moreover, it has been shown how engineering departments responsible for the construction of local water infrastructure often overlook the specific needs of the specific places and its features (Agarwal et al., 2001). They do their job by constructing the infrastructure, however, do not ensure that everything works well afterwards. Hence, according to Das (2012) it is necessary that after water infrastructure projects are finished these projects are monitored.

Considering drinking water, there seems to be a lack of formal policy or legal framework in Madhya Pradesh (Das, 2012). Due to the absence of these rules and laws, there is no oversight to monitor or manage potential threats to the water supply. This is a big problem for keeping water safe and maintaining the systems. Therefore, it is important to work on policies that will fix and update the old ways in collecting and storing drinking water. One crucial aspect of this is to improve the systems which catch and store rainwater across the state.

There is also evidence that finances, received from the national government, are used for short-term needs instead of long-term plans to make regions less vulnerable to droughts

The author Sharma (2023) studied drought impact and policy in the Bundelkhand region in India between 2005-2017. This region stretches a large part of the states Madhya Pradesh and Uttar Pradesh. It was established that more than half of the received funding were diverted to existing water infrastructure, whereas there is a need to finance in the development of watershed management and local water harvesting systems for the long-term mitigation of droughts.

Lastly, despite good effort of the state government to invest in drip irrigation systems among farmers, this has not led to a large enough shift (Evans et al., 2012). Farmers get a large subsidy of the state government when they invest in drip irrigation, however the costs are still too high for smallholder farmers to shift to this effective irrigation system. In order to make real changes, the government could offer interest-free loans instead (Evans et al., 2012). This way the entire costs are covered initially and the farmers can make the changes needed.

Overall, water governance is qualified as inadequate in Madhya Pradesh. Major issues surrounding coordination between departments responsible for water management need to be addressed. At the same time, the state lacks good regulations and a legal framework for drinking water. Lastly, drought mitigation finances should be used more efficiently for long-term adaptation and other ways to promote drip water is necessary to make the state less vulnerable to droughts.

Water infrastructure in Madhya Pradesh. I focus on water infrastructure of rural Madhya Pradesh here, because the community member was transporting water fetched in a village in rural area of Shivpuri district.

According to Chaudhuri and Roy (2017) Madhya Pradesh is one of the five states having the largest disparities between rural and urban household's access to water and sanitation facilities. Specifically, this means that rural households in Madhya Pradesh frequently lack latrine facilities and treated tap water. This makes people in rural areas within the state to participate in open defecation, which has potential adverse health outcomes (Mara, 2017).

The drinking water for households In rural Madhya Pradesh depends almost exclusively on groundwater (Das, 2008). As such, they rely on hand pumps and/or tube wells to extract drinking water. These facilities cannot really be regarded as "safe" drinking water (Chaudhuri & Roy, 2017). Groundwater extraction is heavily contaminated with different pollutants, these pollutants have serious adverse health effects. These clear disparities between rural and urban water infrastructure thus impedes the health of the rural villages.

Moreover, a major issue in rural water supply is the overexploitation of groundwater, which can be seen in many parts in the state (Das, 2012). This could be due to the increasing use of handpumps and tube wells. In a lot of districts this has led to critical groundwater level. Making these areas more vulnerable to droughts. Sustainable practices like rainwater harvesting and micro-watershed could potentially alleviate issues with groundwater.

In summary, water infrastructure in rural Madhya Pradesh faces significant challenges compared to urban areas. Rural communities often lack access to safe, treated water and proper sanitation facilities, leading to health risks and reliance on contaminated groundwater. The state shows one of the largest rural-urban disparities in access to water and sanitation in India, exacerbating health and socioeconomic inequalities.

Water-related grievances. The state involved two communities, namely the Goswami community and Rawat Rajput community. Both the Goswami community and the Rawat Rajput community can be considered part of one of the superior castes in India's caste system (Shrivastava et al., 2017). According to the news report the communities have a history of tensions with each other. These tensions could have contributed to the onset of the communal violence.

In examining water-related grievances, no prior incidents were identified where these communities faced issues concerning water before the drought. Therefore, I conclude there were no water-related grievances between the communities before the incident occurred in 2017.

Summary of key findings. In rural Madhya Pradesh communal violence occurred over water, when the whole state was drought-affected. Inadequate water governance and substandard rural water infrastructure were identified. During the drought period these issues have undoubtedly contributed to the water problems. No preexisting water-related grievances were discovered between the communities involved.

4.3.2 Case 3: Communities clash in Tamil Nadu

In Tamil Nadu the consecutive drought starting in 2015, peaked in 2017 with extreme and severe drought months in 2017 (Ravichandran et al., 2022). Officially, the state (just as 13 other states) was declared drought-hit in 2015 (D. Guha-Sapir, 2000-2023). In 2016 there was a monsoon delay and the monsoon created a deficit of 62% (Kedia, 2017). Due to this deficit water reservoir storage had fallen to only 20% of their capacity. Due to the drought

crops failed and farmers became depressed due to the immense financial burdens. Suicide level increased during the consecutive drought among farmers. Clearly then, there was an immense need for water among rural farmers in Tamil Nadu during these drought years.

Tamil Nadu is the most southern state of India, according to the most recent data the state inhabits around 71 million people. The state also has its own official language, the Tamil language, which is one of the oldest surviving classical languages. The state is the most urbanized state of India and is the second largest economy among the states in India (Srinivasan, 2016). The largest contributing sectors to this economy are services (45%), followed by manufacturing (34%), and agriculture (21%).

During the drought and the experienced scarcity of water there was a clash between communities in Cumbum city in Theni district (Veerappan, 2017). The clash arose from differing perspectives on using a communal water tank: one community intended to use it for ritual cleansing before prayer, while the other, facing water scarcity, contested its use for anything other than essential needs. This disagreement escalated into a confrontation, with individuals from both sides throwing rocks at each other. A police inspector tried to resolve the conflict but got injured instead. The incident led to 18 people getting booked. In line with my definition, I regard this incidence as communal violence over water in a drought-affected area. Specifically in urban area, which I describe in the water infrastructure section.

Water governance in Tamil Nadu. There are multiple indications that mismanagement of water resources by the state government exacerbated water scarcity during the drought. The India Water Partnership (IWP, 2015) assessed Tamil Nadu's water policy prior to the 2015 drought, providing insight into the state's water governance at the time. The IWP noted a stark per capita water availability difference in Tamil Nadu compared to other Indian states, highlighting the state's struggle with water scarcity management. This disparity suggests ineffective water management within Tamil Nadu, a view supported by various findings.

First, the state uses its surface water resources almost completely (95-98%) (India Water Partnership, 2015). This could indicate an overreliance on surface water resources, such as rivers and lakes. Such a high number indicates a cautious balance where the state's water security is heavily dependent on regular and adequate rainfall patterns. Surface water is dependent on rainfall, when a meteorological drought occurs and a state's supply of available water is largely dependent on surface water, this is likely to lead to water scarcity. Furthermore, according to a report of Government of Tamil Nadu, Department of

Environment [GTNDE] (2017), surface water is also used inefficient and excessively, particularly for irrigation purposes.

Second, the decline in functioning of traditional water bodies such as tanks and ponds due to siltation and neglect, and the significant loss of water through evaporation (30% by some estimates), highlight the governance issues in maintaining and managing the state's water infrastructure (India Water Partnership, 2015). These issues not only reduce the effectiveness of these water bodies but also suggest a larger problem of governance and policy enforcement.

Third, there also seem to be governance deficits in the coordination of water development projects (India Water Partnership, 2015). These coordination problems are causing agencies to work more or less independent from each other. Consequently, agencies are working inefficiently and sometimes even duplicating each other's work. There is need for an overarching department who is aware of the quality of the states' water infrastructure and coordinates adequately what and where the different agencies should work on.

In the newspaper by Kedia (2017) the author describes how indeed water scarcity has always been an issue in Tamil Nadu. Nonetheless, in line with points described above, the author underlines how the state government could have prevented the immense water scarcity experienced during the drought by improved water governance. This is mainly, because there was an abundance of rainfall preceding the drought years. Tamil Nadu received above-average rainfall for nine consecutive years prior to the drought (Kedia, 2017). If the state had improved water conservation practices and lake rejuvenation during that time, it would have been able to store larger amounts of water to better cope with the drought conditions.

In line with Kedia's (2017) argument, I also conclude that inadequate water governance made Tamil Nadu more vulnerable for the drought, consequently this contributed to the experienced water scarcity. When Tamil Nadu invested more in reconstructing the water storage facilities before the drought occurred, they could have mitigated the impact of the drought on available water. An explicit example is mentioned in the article of Kedia (2017): In the district Villupuram, water wells were restored to full capacity before the drought occurred under supervision of a company and an NGO. As a result, they had managed to have enough water and cultivation area increased, even when there was a lack of precipitation. In my view, this example shows how local investment in improving water infrastructure makes regions less vulnerable to droughts.

Water infrastructure in Tamil Nadu. The communal clash happened in Cumbum, a city in Southern part of Tamil Nadu, which is situated in Theni district. According to the latest statistics, the city had a population of 68,090 in 2011 (Census India, 2011). Cumbum does have elements of a rural area, especially its strong agricultural base and community-oriented lifestyle. However, its growing population density, increasing non-agricultural economic activities, and improving infrastructure characterizes Cumbum as urban area.

There is suggestive evidence for a disparity between water infrastructure on the rural-urban divide. If one compares the numbers of access to water, for instance, it is clear that urban households fare better than rural households (Raman et al., 2015; Simhan, 2023). In 2015, 80% of urban households had access to tap water supply. Yet, even eight years later, rural households in Tamil Nadu still lag behind at a 62% access rate. Although these numbers are not immense far apart, it still hints upon a disparity between rural and urban water infrastructure.

Moreover, information from the website of the Tamil Nadu Water Supply and Drainage Board (TWAD Board) gives further evidence for the rural – urban disparity. The TWAD Board is responsible for the implementation of water supply and sewage disposal schemes to the public of Tamil Nadu. The water supply schemes for the state outlines targets to provide each rural household with a functional tap connection that delivers 55 liters per person per day (TWAD Board, 2023a), while urban households are expected to receive 135 liters per person per day in municipalities and 70 liters per person per day in towns (TWAD Board, 2023b). As such, the state maintains distinct standards for water infrastructure provision between rural and urban areas. Presumably, these differences reflect different infrastructural capacities between rural and urban areas.

Based on these findings, I conclude there is indicative evidence for a discrepancy between rural and urban water infrastructure in Tamil Nadu. This suggests a contrast between the relatively adequate urban water infrastructure and the deficient rural water infrastructure.

Water-related grievances. No evidence could be found of earlier communal struggles in Cumbum or Theni district involving water in the years preceding the drought. In fact, the police superintendent clarified in the news report that there had been no major issues between the two communities prior to this incident, stating, 'This was the first dispute of its kind' (Veerappan, 2017). Hence there were no preceding water-related grievances between the communities before the incident occurred.

Summary of key findings. In Cumbum city in Tamil Nadu communal violence occurred when two communities had opposing views about the use of water from a water tank. Tamil Nadu was drought-affected and facing water scarcity. Inadequate water governance made Tamil Nadu more vulnerable for the drought, consequently this contributed to the experienced water scarcity. Furthermore, evidence suggests that the urban water infrastructure in Tamil Nadu is comparatively well-developed. Finally, no preceding water-related grievances were identified.

4.3.3 Case 4: Farmer protests in Maharashtra

During extended drought of 2015-2018, Maharashtra has seen several farmer protests. However, in 2018, the largest protests among farmers were organized. In March of 2018, for instance, 35,000 farmers walked from the Nashik district to the state's capital Mumbai (Sen, 2018b). The demands included several measures to take the farmers out of their financial stress caused by the drought. The long drought had disrupted water availability immensely for the farmers contributing to losses of crops. This burden had become so immense on farmers' livelihoods that in 2017 more than 2,400 farmers committed suicide. This particular protest ended when the state government provided a written assurance addressing the farmers' major demands (Sen, 2018a).

Similarly, in the middle of November of 2018, a protest erupted in Maharashtra (Pawar, 2018). Over 10,000 farmers demanded intervention from the government to mitigate the drought-induced distress. Their demands included financial aid for drought-affected farmers and access to proper drinking water. This protest highlighted the multifaceted impact of water scarcity, demonstrating how the drought had led not only to agricultural problems but also to drinking water challenges in the region.

Again, in November of the same year agitated farmers started to march to Mumbai ("Farmers end stir after state says will meet demands in 3 months," 2018). Farmers claimed that not much progress had been made after the written assurance in March by the state government. The farmers demanded, among other things, appropriate relief for drought-affected farmers. The state government adhered to the demands; it concluded that due to the unprecedented drought farmers had an unproductive period of farming. Consequently, they were unable to pay off their loans, and therefore, the loans were waived by the government. Since the government adhered, the protest march stopped as well.

In all of these news reports describing the different protest marches by the farmers of Maharashtra not a single thing is mentioned about property damage or the use of violence.

These marches could have been disrupted for society, for instance, affecting traffic. However, the fact they did not use any violence, leads to the conclusion that the farmers marches were acts of protests as operationalized in my study.

Water governance in Maharashtra. A study conducted by the Groundwater Survey and Development Agency (GSDA) over 2018-2019 indicated water scarcity within the state, evidenced by the significant reduction in groundwater levels, surface water bodies, and soil moisture content (Singh, 2018). Additionally, the report attributed water scarcity to inadequate water management, unchecked groundwater extraction, inefficient irrigation practices, and compromised aquifers, factors that were significant even in the absence of rainfall. Hence, the report claims the government could do more to prevent droughts to affect groundwater level this heavily.

More evidence for mismanagement of groundwater levels can be found. According to Khare et al. (2020) the groundwater levels are not used efficiently. When Maharashtra experiences a drought, the annual recharge of groundwater is significantly reduced, impacting performance of wells. Specifically, aquifers are not restored optimally when rainfall is lacking, thereby the wells perform less. This loss needs to be compensated for when the state experiences drought conditions. Hence water conservation programs are necessary to mitigate the impact of droughts. However, most of these measures taken by the government are on a local level, neglecting the need for a larger regional approach. Consequently, this leads to drought-prone areas experiencing water scarcity frequently.

The state government estimates that water refill of the aquifers in drought-affected areas aligns with standard estimations (Khare et al., 2020). However, this is not the case, in drought prone areas these aquifers do not recharge to its optimum, due to ground characteristics. Hence these aquifers remain drier and dug wells tapping into these aquifers are experiencing water scarcity more rapidly. The authors argue for a more integrated approach preventing overextraction in one area and too little extraction in other areas. This would also mean cooperation among the irrigation and groundwater departments, instead of working in isolation of each other.

In line with this, in a report of the Government of Maharashtra, Water Resource Department [GMWRD] (2019), it is highlighted that groundwater is often treated as private property by the residents. This results in the government having limited control over its management, leading to unequal extraction rates. The lack of legislations mandating groundwater recharging has permitted its over-exploitation. The absence of regulations to

enforce sustainable groundwater extraction and enforce recharge measures has contributed to the drought scenarios in Maharashtra. The state government can overcome this by implementing legal frameworks that balance the rights of individual water users with the collective need for groundwater extraction over the whole state.

Additionally, the state is also lacking legislative measure to protect natural water bodies and drainage channel from encroachment (GMWRD, 2019). These zones are essential for the restoration of groundwater levels, but are frequently obstructed or diverted to alternative uses. Consequently, aquifers in these areas can't recharge to normal levels, impacting the overall state's water infrastructure as well. The state government's lack of inspection in preventing such encroachments contributed to further restraining available water sources in the state.

Lastly, considering the drought mitigation strategies of Maharashtra (GMWRD, 2019), the state will promote micro-irrigation in drought prone areas. This is the same as drip irrigation systems. I think it is a good idea to promote this, however, the report has no specification on how this will be promoted. Farmers in rural Maharashtra do not have the financial resources to switch to these systems. Furthermore, they should be trained in using this method for irrigating their crops. Lacking any specifications on how to implement this strategy is neglectful.

Overall, I contend the water governance in Maharashtra state to be inadequate. This is mainly based on the management of the groundwater levels. There are issues with overextraction, encroachment, dried up aquifers, and unequal use of groundwater. To overcome these issues, the state government should focus on using groundwater levels more efficiently. A more integrated approach preventing overextraction, regulations to enforce sustainable groundwater extraction, and legislative measure to protect natural water bodies and drainage channel from encroachment are the most crucial steps to be taken. In so doing, the state would become less vulnerable to droughts and farmers will experience less crop failures.

Water infrastructure in Maharashtra. Similar to the situation in Karnataka, in Maharashtra there is also a gap between Irrigation Potential Created (IPC) and Irrigation Potential Utilized (IPU), meaning that more field channels should be created to divert water to the agricultural lands (GMWRD, 2019). However, a large part of the agricultural land cannot be brought under irrigation, the ultimate irrigation potential of the state is 56% of the total

cultivable area. Hence, a large part of agricultural land in Maharashtra remains dependent on other ways to obtain water, such as rainwater harvesting.

In addition, there is a lack of proper maintenance of the irrigation infrastructure at hand (GMWRD, 2019). This results in lower water use efficiency. According to the report, a big challenge is to balance investments on completing ongoing water resource projects and the maintenance of existing water infrastructure.

There is evidence for a discrepancy between rural and urban access to water in Maharashtra as well. In a news report of the Times of India it is described how rural villages receive almost 5 times less of the available drinking water compared to the cities in the state (Kakodkar, 2015). This discrepancy is alarming given the fact that 55% of the citizens in Maharashtra live in rural area, compared to 45% in urban area. This inequity is driven by state policy, the norm is that rural areas are indeed entitled to less drinking water, because people in rural villages have access to alternative water sources as well. However, due to droughts, these alternative sources become scarce in rural Maharashtra.

The state government is in fact aware of the issues with drinking water in rural regions. This is evidenced by the loan the state received from the World Bank to implement Maharashtra JS2 program (World Bank, 2014). This program's goal was to improve the management of the water sector in Maharashtra's rural water supply and to improve quality and access to the villages. This underscores the awareness of state of the water infrastructure in rural Maharashtra but also the problems the state faces financially in developing this sector.

In sum, there is clear evidence for an inadequate state of the rural infrastructure. There is a lack of irrigation to the agriculture lands and maintenance is lacking of existing irrigation infrastructure. On top of that, drinking water is diverted less to rural areas compared to urban cities. The state government is working on improvements through investments of the World Bank.

Water-related grievances among farmers in Maharashtra. To conclude whether farmers from Karnataka experienced already water-related grievances against the state government I have looked for incidents between the state and the farmers over water before the drought and the protests occurred.

Before the drought of 2015-2018, there had been one other instances of farmers unrest in the state due to water scarcity. In 2013, farmers held a sit-in in Mumbai to draw attention to an earlier drought situation within the state (Modak, 2013). It was particularly about the lack of water in the Ujni dam and the limited response by the state government. No other instances were found. However, I am skeptical about the extent that this incidence led to water-related

grievances among farmers in Maharashtra. Only 50 people took part in this sit-in. Moreover, it is based on water scarcity reported in one district within Maharashtra, namely Solapur district. Based on the small scale of this incidence relative to the massive marches during the drought in 2018, I do not contend this issue to exemplify water-related grievances within the state among farmers of Maharashtra. Therefore, in Maharashtra preexisting water-related grievances involving farmers were not established.

Summary of key findings. Multiple protest marches among farmers erupted in 2018 in Maharashtra. The water issues during multiple consecutive drought years impacted the farmer's productivity and income. They demanded sufficient relief-measures for drought-affected farmers and waiving of loans. When the government adhered to the demands the protests stopped. The assessment revealed that water governance and rural water infrastructure in Maharashtra are lacking in adequacy and no preexisting water-related grievances were identified.

Chapter 5: Discussion

In chapter 4, I have described my main findings doing my analysis. In this chapter I first delineate shortly the theoretical approach taken. Afterwards, I will discuss the findings based on this approach. I will do this in ascending order of the intensity of political violence. As such, I will first interpret the findings related to protests, then I will delve into riots, and lastly, I will examine communal violence

5.1 Nuanced approach

As described in chapter two, I adopt a nuanced approach in explaining how droughts lead to political violence in India. I do not deem either the political approach or the economic approach as more valuable in explaining the mechanism. Both approaches together could help to understand how political violence emerged in India from droughts. Specifically, this indicates that the factors contributing to the likelihood of droughts leading to political violence in India are interconnected.

In examining the causes of political violence arising from droughts, it is essential to consider both the economic and political dimensions. The economic approach, as postulated by scholars like Collier and Hoeffler (2004), posits that the motivation for conflict often stems from economic opportunity—where individuals or groups engage in conflicts when there's potential personal gain, such as access to resources or a change in power dynamics that could benefit them financially. Conversely, the political approach focuses on grievances, arguing that conflicts arise from perceived injustices and inequalities among groups, particularly when political, economic, social, or cultural disparities become pronounced. This perspective is reinforced by the work of Stewart (2008), who highlights the role of group identity and horizontal inequalities in mobilizing conflicts. By adopting a nuanced approach, I recognize that the drivers of political violence in the context of droughts in India are multifaceted. Both economic and political factors cannot exclusively explain the emergence of political violence.

In the theoretical chapter, an argument is presented that describes how certain conditions increase the likelihood of different forms of political violence in areas affected by drought. Inadequate water-related governance is posited to increase the likelihood of protests. When this inadequate governance is coupled with poor water infrastructure, the theory suggests that riots become more probable. Lastly, when these two conditions are present together with water-related grievances, communal violence is more likely.

5.1.1 Drought and protests

In my analysis I demonstrated how protests arose among farmers in India. Two conditions were present in the protests by farmers in Maharashtra. I found inadequate state water governance and a disparity between urban and rural water infrastructure to be present. This is not in line what I expected. I anticipated inadequate water-related governance to be sufficient to increase the likelihood of protests. However, I thus found poor water infrastructure to be present as well. This is not in line with the progressive escalation of conflict suggested by my model, meaning that both of these conditions would anticipate riots instead.

Nonetheless, I did find both of these conditions also to be present in riots in Karnataka. This contrasting outcome (both conditions present in both subcategories of political violence) suggests two things. First, it is possible that Maharashtra experiences both conditions, but they are less severe compared to Karnataka. This difference in severity may explain why Karnataka faced riots while in Maharashtra the same conditions resulted in protests. Another option is that additional conditions influence whether a situation leads to protests or escalates to riots. In my view, an additional condition influenced the onset of riots in my study. In the next section about riots, I will delve into this issue.

The fact that I find both conditions to be present in farmers protest in Maharashtra shows that when this state experiences a long consecutive drought as in 2015-2018, this brings issues with water scarcity in the state to the forefront. The drought amplifies the state's problem with water management and the deprived state of the rural water infrastructure. Specifically, mismanagement of groundwater levels makes scarcity more likely in Maharashtra when rainfall falls short. Also, the state of the water infrastructure in rural Maharashtra, which falls relatively behind compared to urban areas, contributes to water issues experienced by farmers. Due to shortage of irrigation to farmland and lack of maintenance, farmers will be the first to experience water scarcity during a drought period. Therefore, a drought exacerbates the disadvantaged position of farmers regarding water management. This makes them more likely to protest.

My finding of inadequate water governance corroborates with the study of Masiangoako et al. (2022) in South Africa. The research conducted by Masiangoako et al. (2022) showed that when governance is lacking in the provision of the communities' right for water, they often turn to protests. My study extends this finding to farmers in drought-affected states in India, and highlights how the deficient state of the water infrastructure also contributes to the likelihood of protests.

Furthermore, my finding is consistent with the quantitative evidence presented by Sánchez and Rylance (2018). These authors demonstrated that negative rainfall shocks are correlated with an increased probability of water-related social unrest, including protests, via poor water distribution. My study replicates these findings, revealing a similar pattern where agricultural areas suffer from a disproportionately poor water supply compared to urban regions, in turn making protest more likely.

Nonetheless, contrary to the explanation of Sánchez and Rylance (2018), I assert this not to be the result of horizontal grievances. The news articles about the peaceful protests in Maharashtra did not report anything about farmers feeling deprived of water in comparison to urban people. I contend the farmer protests were not instigated because farmers felt relatively deprived of adequate water infrastructure. More accurately, I anticipate the farmer protests were stemming from discontent over lack of governance in improving water infrastructure and mitigating the drought impact, irrespective of the urban-rural divide. Thus, it was a sense of absolute deprivation, rather than relative deprivation, that sparked the farmer protests.

5.1.2 Drought and riots

In my analysis it became clear how both inadequate water governance and substandard water infrastructure increased the likelihood for riots in a drought-affected area. This aligns with my prediction that when both of these conditions are present, this is likely to lead to a more intense form of political violence, namely riots. Similar to the explanation of protests, the drought amplifies the state's problem with water management and the deprived state of the rural water infrastructure. However, why did these conditions lead to protests in Maharashtra and to riots in Karnataka?

In my analysis of the Karnataka riots, there could potentially be an additional confounding variable not measured. In my view, existing ethnic grievances between Tamils and people from Karnataka could have played a role as well. These grievances are beyond the measure of water-related grievances as operationalized in my analysis. They are deeply rooted in the ethnic conflictual relationship between the states of Karnataka and Tamil Nadu and their populations. Evidence that this could have influenced the intensity of the conflict come from the news reports. During the riots, part of the destruction of property was clearly directed at property related to Tamil Nadu (Shankar, 2002). For instance, a sculpture of the chief minister of Tamil Nadu was destroyed, and farmers smashed a bus with Tamil Nadu registration. Additionally, authorities implemented preventive measures, such as halting the distribution of Tamil films and suspending cable television broadcasts with Tamil language,

amid concerns of escalating ethnic tensions against the Tamil minority in Karnataka (Ghosh, 2002; "Water row sparks clashes in India," 2002).

To give some background information about the roots of these ethnic grievances; they stem from perceived unfair allocation of water. On the one hand, farmers from Karnataka argue they should rightfully get a larger portion of freshwater, because their state's rainfall contributes significantly more to Cauvery's River water (Baldauf, 2002). On the other hand, farmers from Tamil Nadu maintain they have the right for the lion share of river water on historical bases. They argue that it was the efforts of Tamil Nadu engineers who developed the river, making the region suitable for agriculturally. These opposing viewpoints contribute to existing feelings by the farmers of feeling treated unfairly. Historically, the interstate water distribution dispute has repeatedly led to civil unrest, with the peak of conflict occurring in 1991 when ethnic riots in Karnataka resulted in the deaths of over 25 individuals, predominantly Tamils ("Police arrest 40 farmers as Indian water row boils," 2002).

Concretely, one could imagine that these additional grievances intensified the frustration among the farmers in Karnataka during the drought of 2002. Especially, because the ruling of the Supreme Court was about the water dispute between the two states again. To conclude, ethnic grievances between the populations of Tamil Nadu and Karnataka could explain why poor water governance and water infrastructure sparked riots among farmer in Karnataka, while similar issues only led to protests in Maharashtra.

5.1.3 Drought and communal violence

I expected when all the three pre-conditions were present in drought-affected areas this would increase the likelihood of communal violence. In the analysis I identified two cases of communal violence in drought-affected areas. In both cases there is poor water-related governance contributing to water scarcity. This water scarcity presumably increased the competition over water between the communities. Hence, inadequate water governance potentially contributed to the escalation of tensions between communities.

Considering the state of the water infrastructure I found mixed results. In Madhya Pradesh, the water infrastructure was poor; in line with my hypothesis. However, the communal clash that occurred in Tamil Nadu happened in an urban area. There was suggestive evidence in Tamil Nadu that urban areas have relatively better water infrastructure compared to rural areas. Nevertheless, I contend that the water infrastructure could still have facilitated the water scarcity experienced in Tamil Nadu. The water infrastructure experienced by a part of the urban population could still have been impoverished despite the relative

urban-rural difference. Especially, since In Tamil Nadu the urban poor, particularly in slums, face inadequate housing and lack essential services like clean water, sanitation, and waste facilities (Asian Development Bank, 2021). Thus, the relatively better infrastructure in Tamil Nadu may not have been sufficient in the face of acute water scarcity and might still have contributed to tensions.

Turning to a different aspect, the condition of water-related grievances was not identified in these cases. Neither in Madhya Pradesh nor in Tamil Nadu instances were found of water-related issues preceding the drought. This lack of evidence shows that communities can become violent with each other over water, in the absence of earlier issues regarding water. Nonetheless, grievances between groups can also be manifested without a history of water issues. In the case of Madhya Pradesh it was reported that the groups involved had a history of tensions with each other ("Water clash leaves three hurt in Shivpuri, six booked," 2016). In Tamil Nadu, however, the incident was clearly the first incident among the involved communities. These findings suggest two things. First, water stress could act as a conflict enhancer for communal violence in areas with preexisting grievances between groups, that are not related to water issues. The struggle for water is merely another subject where these groups fight about. These preexisting grievances can stem from different aspects in Indian society.

For instance, the grievances could stem from caste differences (Sarbahi & Koren, 2021). In the past the caste system would ensure that the hierarchy of social classes would be kept in place. The higher caste members had a higher social status and had better jobs, whereas the lower caste member had less job opportunities and were often victim of discrimination. Officially, the caste system has been abolished, however, in India the caste system is still visible in everyday life and influences your position in society. Therefore, it still remains that being part of a lower social class is accompanied by less job opportunities, less wages or discrimination. Consequently, these caste differences have reported to have contributed to caste violence (Sarbahi & Koren, 2021; Shani, 2007).

Second, my finding also suggests that water stress can give rise to conflicts between communities with no preceding tensions, purely due to the imminent need for water. Hence, one could argue that preexisting grievances is not a necessary condition for disputes between communities over water, but it can increase the likelihood.

In this chapter I will first summarize my main findings and conclusions of my thesis. Thereafter, I depict implications and the limitations of my study. Lastly, I will describe possible avenues for future research.

6.1 Main findings and conclusions

The research question of my thesis was: “What effect does drought have on the likelihood of political violence in drought-affected areas in India between 2002-2018?”. The first hypothesis predicted that when water-related governance is inadequate in drought-affected areas the likelihood of protests increases. This hypothesis is partly confirmed in my analysis, I found evidence of lacking water governance to contribute to water scarcity in drought-affected area making protest more likely. However, deficient water infrastructure also played a role in intensifying water shortages, which may have contributed to the protests arising during the drought. Hence, one would rather conclude that both of these conditions make protest more likely in drought-affected areas in India.

Furthermore, in line with the second hypothesis I expected that inadequate water-related governance and substandard water infrastructure in drought-impacted areas increase the likelihood of riots. I can confirm this hypothesis, as both of these conditions were found in my analysis. Nevertheless, it remains questionable whether both conditions are sufficient to cause riots in my study. As I assert riots to be a more intense form of political violence compared to protests, I expected a difference in conditions between the two categories of political violence. I did not find this difference in the analysis. Nonetheless, this disparity can be explained by ethnic grievances between the populations of Karnataka and Tamil Nadu as outlined in the discussion.

Lastly, my third hypothesis suggested that in areas affected by drought, a combination of inadequate water governance, poor water infrastructure, and grievances related to water would likely heighten the risk of communal violence. This hypothesis was not confirmed. Evidence was found for inadequate water governance, however for poor water infrastructure the evidence remains suggestive. No findings of water-related grievances could be established.

Overall, I conclude that in India droughts exacerbates existing issues concerning water governance and water infrastructure. In all the cases in my analysis it was found how water governance was lacking by the different Indian states. The pitfalls in water management

makes these states more vulnerable to droughts, making political violence more likely. The disparity in water infrastructure between urban and rural areas within Indian states has also played a role in increasing the potential for political violence. Especially, rural livelihood for farmers is affected by this disparity. Making them more likely to partake in riots or protests.

6.2 Implications

Since my analysis demonstrate that under certain conditions droughts are more likely to lead to political violence in India, it is important to understand what could be opportunities to address this. My analysis indicated that one of the main issues lies in the water governance of the different states. There is overlap between the cases in where water governance is lacking.

To begin with, a common problem in multiple states was the neglect of traditional water infrastructure. This neglect has resulted in the loss of water through siltation and evaporation. The maintenance or the modernization of the traditional water infrastructure could act as buffers during periods of water scarcity. In both Tamil Nadu and Madhya Pradesh this issue needs to be addressed.

Additionally, groundwater management by the states needs to be improved. The cases suggest there is inefficient use of groundwater, with uncontrolled extraction leading to a reduction in water levels and damaged aquifers. To address this issue one important crucial first step is to have one overarching institution in each state to take control over water governance. This institution would be responsible for the inter-departmental coordination and communication. Issues pertaining these areas has led to dysfunctional management of water resources. In so doing, this can, for instance, prevent overextraction of groundwater in one area, leading to depleted wells in another area. Moreover, this could help in distributing water more efficiently between sectors when water becomes scarce. This holistic approach can potentially alleviate the experienced water issues from droughts in the Indian states.

One last point of water governance concerns adopting legal frameworks and policy enforcement. This includes making rules to keep lakes and rivers safe from being taken over for other uses and to ensure water is used in a way that doesn't use it all up too fast. I identified that the absence of robust policies and regulations to manage water resources, has resulted in inequitable water distribution and overexploitation, particularly of groundwater.

Furthermore, the impact of these governance issues is most evident in rural areas. There is a clear discrepancy in water access between rural and urban Indians. This could, for instance, be seen in access to drinking water but also looking at the water problems farmers

experience in cultivating their lands. Consequently, incidences of political violence were predominantly found in rural India.

Presumably, the Indian state governments has focused mainly on urban areas in developing water infrastructure. This can be explained by a tendency to prioritize urban areas in the allocation of resources in developing countries (Sánchez & Rylance, 2018). This is done to avoid civil unrest. In densely populated cities, discontent regarding inadequate services like water supply can quickly escalate into widespread anger and protests, which have the potential to threaten political stability. Political leaders, comprehend that based on this, it is more important for their political survival to concentrate on the development of infrastructure in urban centers. Hence, rural area tends to get neglected in infrastructural development.

Nonetheless, as the findings in my thesis underscore that political unrest may also manifest in rural areas when infrastructure gets neglected, the Indian government should give higher priority to the development of rural water infrastructure. Therefore, an effective strategy to mitigate the impact of droughts and water scarcity in India could involve enhancing the irrigation of agricultural land. Given that less than half of India's agriculture is irrigated (The World Bank, 2020), targeted improvements could make a significant difference.

Moreover, India could setup programs to learn rural farmers in drought-prone areas on effective ways to harvest rainwater, and by supporting the adoption of more water-efficient irrigation methods, such as sprinklers or drip irrigation systems. As research by Suresh et al. (2019) indicates, these methods are notably more efficient than traditional irrigation techniques commonly used in India. To ensure widespread adoption, the government could offer subsidies to farmers willing to invest in these modern methods. It should be mindful of inclusion, as smallholders and farmers belonging to scheduled tribes or castes have often been left behind in adopting such irrigation techniques (Suresh et al., 2019). Targeting subsidies to these particular social groups and possibly making the subsidies income-dependent could influence a more equitable distribution of resources and help in substantially reducing the demand for water. This comprehensive approach could align with broader efforts to create a sustainable and resilient agricultural sector in India.

6.3 Limitations

For one thing, there were no findings of water-related grievances affecting the onset of the different forms of political violence. Concerning protests and riots this was indeed not

expected, however, I did expect water-related grievances to increase the likelihood of communal violence. In hindsight, it seems that the concept of water-related grievances may be too narrowly defined. Such grievances, might not fully capture the broader and more complex issues contributing to communal violence. In India, water access is deeply rooted with social hierarchy (Adagale, 2020; Dutta et al., 2015), with caste playing a pivotal role, particularly in rural areas. Lower caste individuals often face severe challenges in accessing freshwater and regularly encounter segregation, discrimination, and violence in their struggle for this resource (Dutta et al., 2015). Therefore, it's reasonable that the grievances fueling communal violence over water are not only about the resource itself but are also rooted in the caste discrimination in India. Based on this, it could have been the case that grievances related to caste-discrimination was too complex and diverse to adequately attribute to water.

Furthermore, the fact that I find both inadequate water governance and poor water infrastructure present in riots and protests could also imply a spurious relationship. There might be a third factor explaining the onset of protests and riots besides water governance and water infrastructure.

Another limitation of my study is its generalizability. This thesis was conducted in the context of India. Thus, it involved the Indian population, the Indian government and the Indian water infrastructure, to name a few. Hence, the findings from my study are mainly applicable to the Indian context. While my findings offer valuable insights into this phenomenon within India, it is important to exercise caution in generalizing these results to other regions or contexts. The specific factors that drive this mechanism in India may vary substantially in other geographical or cultural settings. Therefore, the empirical manifestations of this mechanism might differ considerably across different cases.

However, the underlying logic of water scarcity leading to political violence, in drought-affected areas with substandard water infrastructure and water governance, might indeed be present in other contexts. Future research could explore the applicability of this mechanism in different regions, taking into account the unique characteristics and variables that may shape the relationship between drought and conflict in those areas.

Also, the data used in my thesis were news articles and academic literature. Although these sources are reliable and have given me a comprehensive outlook on droughts in India, it could be the case that conflicts or other consequences of the reported droughts remained unreported. Due to language constraints, I was only able to find instances of political violence that captured attention of bigger newspapers, whereas local newspapers presumably report about local instances as well. This issue came to the forefront when finding events of

communal violence. In news articles it was described how water scarcity from droughts increased the number of communal struggles over water (See for example: Niazi, 2016). However, due to the small scale of these struggles they were supposedly not captured in the bigger English-language newspapers.

6.4 Future research

First and foremost, future research can investigate whether the identified mechanism has parallels in other drought-prone regions globally. Comparative analysis with countries having similar or contrasting governance structures and societal dynamics could highlight commonalities or particularities in the mechanism.

Secondly, additional research is needed to explore whether droughts can instigate conflicts in India through other causal pathways. While my study focused specifically on political violence arising from water scarcity, it does not rule out other means by which droughts might lead to conflicts in the Indian context. One potential avenue for investigation is how water scarcity from droughts disrupts Indian agriculture, possibly causing food insecurity among the population. While I established in my thesis that farmers were willing to protest because water scarcity impedes their crops, I did not delve into whether these agricultural challenges led to consequences such as food insecurity in India or increased food prices. Since food insecurity has been linked to the onset of conflicts (Jones et al., 2017; Koren et al., 2021), this represents an important consideration that warrants further examination in the Indian context. Studying these additional dimensions could provide a more comprehensive understanding of how conflicts emerge in response to droughts in India.

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