

What is the role of climate change as a conflict multiplier in Mali?

Marc Flessa
m.flessa@student.rug.nl
+49 15170156530

18.06.2021

Capstone Project under the supervision of:
Prof. Caspar van den Berg &
Alexandre Belloir (MA)

University College Fryslân
University of Groningen
Wirdumerdijk 34, 8911 CE, Leeuwarden
The Netherlands



Maiga & Marquette (2021)

Abstract

Climate change (CC) has a wide range of impacts on human livelihoods. Especially within the realm of policy making, its security dimension has been highlighted. It has been argued that CC could lead to conflict by multiplying existing or creating new conflict risks. In general, both direct and indirect pathways link the impacts of CC and the outbreak, continuation and intensification of conflict. However, the scholarly support and empirical evidence is rather mixed. Also the current multidimensional conflict in Mali, has been linked to CC impacts. Employing a qualitative case study based on existing literature and qualitative questionnaires, this research paper analyses the role of CC as a conflict multiplier in Mali. Although the exact environmental impacts of CC are uncertain, it is likely to severely impact agricultural output and hence local livelihoods. In particular, CC impacts the migrating times and paths of nomadic pastoralists. In interaction with existing conflict factors like weak and partial governance, ethnicity and jihadist violence, CC multiplies existing land-use conflicts. Furthermore, CC complicates trans-regional water management, accelerates migration and directly negatively impacts military activities of (international) peacekeeping forces. However, also (failed) adaptation to CC can create negative side-effects, multiplying existing conflict risks. To address the conflict multiplying potential of CC in Mali, involved stakeholders should improve their cooperation and focus on local resilience building.

Key Words Climate change, conflict, conflict multiplier, Mali

Word count 10329 (Excluding Title Page, Abstract, Table of Contents, Acknowledgments, References and Appendix)

Table of Contents

	Page
1. Introduction	3
2. Literature Review	6
2.1 Pathways linking CC and conflict	6
2.2 Empirical evidence of the links between CC and conflict	8
2.3 CC as a “conflict multiplier”	9
3. Methods	10
3.1 Research Design	10
3.2 Data Collection	11
3.3 Data Analysis	13
4. Analysis and Discussion	13
4.1 Climate and Livelihoods in Mali	13
4.2 Land use conflicts between herders and farmers	15
4.3 Trans-boundary water management	19
4.4 Migration	19
4.5 Governance of Adaptation	20
4.6 Direct impacts on military activities	21
4.7 Policy Considerations	21
5. Conclusion	22
6. References	24
7. Appendix	28

Acknowledgments

I wish to express my sincerest gratefulness for the outstanding help and guidance provided throughout this research, by my two great supervisors, Prof. Caspar van den Berg and Alexandre Belloir (MA). Moreover, I want to thank the experts and practitioners who participated in this research and filled out the questionnaire. Lastly, I want to wholeheartedly thank my beloved parents for their support and encouragement throughout my undergraduate studies of which this paper is the culmination.

1. Introduction

“Many factors influence the peacefulness and stability of societies” (Hsiang & Burke, 2014, p. 40). Climate (change) is one of these factors. Human-induced climate change (CC) has far reaching consequences including temperature increase, altered precipitation patterns, increased extreme weather events, natural hazards, and sea-level rise (Bernauer et al., 2012; Levy et al., 2017). Both domestically and internationally, groups and countries with already existing vulnerabilities (e.g. age, ethnicity, poverty) are most negatively impacted and have the lowest resilience to withstand its effects (Levy et al., 2017).

In 2007, the Intergovernmental Panel on Climate Change (IPCC) acknowledged the security dimension of CC. Security in this context is to be understood as involving diverse aspects which are directly or indirectly linked to human well-being and its interaction with the environment, ranging from soil degradation to demographic developments, food and health (Huntjens & Nachbar, 2015). However, this also encompasses the traditional meaning of security, namely “the protection of the territorial integrity and political sovereignty of the state from external military aggression” (Koubi, 2019, p. 344) and one should add, also from internal aggression. Following this reasoning, the argument has been put forward that in interaction with other factors, for example poverty or weak governance, the impacts of CC could create new or multiply existing conflicts. The most direct link would be by increasing scarcity of resources such as fresh water or fertile land (Nordås & Gleditsch, 2007; Koubi, 2019).

The latest since this 2007 IPCC report, the relation between CC, security and conflicts has become a core political concern. The United Nations (UN) security council declared CC a “security issue” and a wealth of (government) reports engages with the topic, such as the influential CNA corporation (2007) report (Nordås & Gleditsch, 2007). Moreover, high ranking politicians and officials support the link between CC and conflict. For example UN Secretary General Ban Ki Moon directly linked the vicious Darfur conflict to CC induced resource scarcity (Benjaminsen et al., 2012). Most recently, French President Emmanuel Macron proposed a special UN envoy for climate security (Maiga & Marquette, 2021). However, also criticism against this deterministic link between CC and conflict has been raised. Nordås & Gleditsch (2007) criticized a lack of scientific evidence. Despite the publication of many studies, articles, and reviews on the matter in the last years, von Uexkull & Buhaug (2021) still call for more research linking policy implications and scientific evidence.

In recent years and decades, the African Sahel region (see Figure 1), has been confronted with increasing instability and the threat of jihadist groups (Crawford, 2015). In response, increasing numbers of international (peacekeeping) troops have been deployed in the region (Coleman et al., 2021). In addition, Crawford (2015) warns of the Sahel being “a key hotspot for global climate change” (p. 1) and that “high levels of vulnerability and low adaptive capacities” (p. 1) accelerate existing insecurity (see Figure 2). Although the climate predictions for the Sahel region are highly uncertain (Heinrigs, 2010), already in 2005, Nyong & Fiki reported the Sahel region to be confronted with an increased frequency and magnitude of conflicts of which many revolve around the competition for climate-sensitive scarce resources like water or fertile land. Next to the aforementioned Darfur conflict, Mali has been described

as a “hot-spot’ for climate–conflict links” (Walch, 2019, p. 9). In support of this, the United Nations Multidimensional Integrated Stabilization Mission in Mali (MINUSMA) officially recognized the risk posed by CC in 2018 (Hegazi et al., 2021).

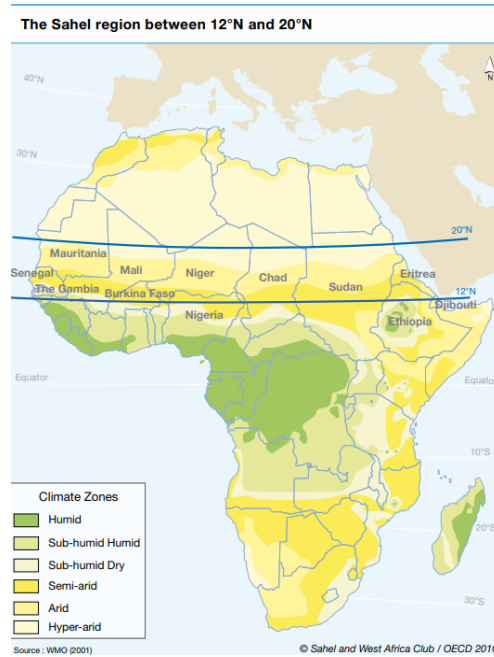


Figure 1: Map of the Sahel Region (Heinrigs, 2010)

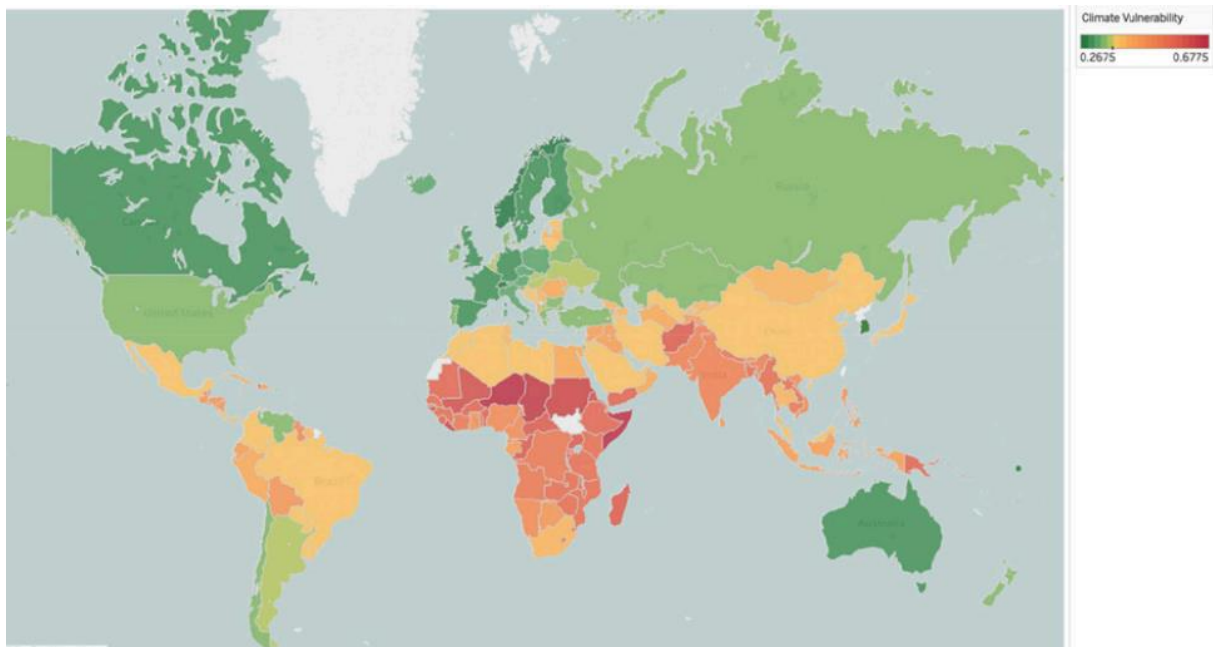


Figure 2: Map of Vulnerability (exposure, sensitivity and adaptive capacity) to climate change (Middendorp & Bergema, 2019)

Over the last years, the overall security situation in Mali has been dire. The recent military coups in August 2020 and May 2021 exemplify this (The Economist, 2021). The land-locked country (see Figure 3) with a size of 1,240,278 km² has a long history of regional and ethnic conflicts but enjoyed years of relative stability and democracy from the 1990s until 2012 (Kalkavan, 2017; Coleman et al., 2021). However, in 2012, Mali's "annus horribilis", a rebellion led by Tuaregs and soon jihadist groups and militias seized control of northern Mali. As a response, a military coup overthrew the democratically elected Malian president and only a French counteroffensive in early 2013 stopped northern Rebels from marching towards the capital Bamako (Pezard & Shurkin, 2015; Ping, 2014). In April 2013, MINUSMA was employed to help stabilize the country (UN Secretary General, 2021; Hegazi et al., 2021). However, since an "upsurge in violence" (UN Secretary General, 2021, p. 4) especially in the central province of Mopti, the overall security situation has rather deteriorated. "More than 287,000 Malians were internally displaced as of mid-2020 [...] and at least 142,000 were refugees in neighboring countries" (Arieff, 2020, p. 1). "Since the inception of the Mission in 2013, a total of 140 MINUSMA personnel have died as a result of malicious acts" (UN Secretary General, 2021)". In addition, likely thousands of civilians, Malian soldiers and members of different armed groups lost their lives.



Figure 3: Map of Mali (Hegazi et al., 2021)

Maiga and Marquett (2021) argue that "the root of the conflict in Mali is climate change-related" and a drought in the northern provinces might have been indeed one reason for the uprising in 2012 (Mitra, 2017; Kimenyi et al., 2014). Furthermore, especially in central Mali, CC impacts low-scale and communal violence (Walch, 2019). However, other scholars and authors have been more critical regarding the role of CC for conflicts in Mali. Benjaminsen (2020) for example warns of using Mali as a case study to reinforce

the deterministic narrative of CC leading to resource scarcity and conflict. For the author, environmental and climate-related factors like droughts are just one, often minor factor explaining the occurrence of violent conflict. Political and contextual factors and vulnerabilities such as malnutrition, poverty, ethnic tensions and weak or non-existent governance have been described as more important reasons for the outbreak of violence (Heinrigs, 2010). Recalling the international political interest and involvement in the conflict(s) in Mali, it is of high academic and political importance to in detail understand the interrelation of diverse conflict drivers. This paper aims at scientifically and in detail engaging with the question how CC interacts with other risk factors in Mali and what its role has been in the onset and continuation of conflicts in the past, present and future. In other words, this paper sets out to address the research question:

What is the role of climate change as a conflict multiplier in Mali?

Different studies on the relation between climate change and conflict employ different definitions of what qualifies as 'conflict'. This paper employs a rather broad definition. Several quantitative studies use a threshold of minimum 25 battle related deaths per year and the involvement of at least one state actor to define conflict. However, such a definition might exclude local low-scale violence and forms of conflict like riots or live-stock theft which are typically associated with CC (Scheffran et al., 2012). Such conflicts are in particular important to analyze in the context of Mali, as the inflow of weapons and ethnic and other conflict dynamics can easily lead to the violent escalation of originally small tensions (Walch, 2019; Crawford, 2015). Hence, this study discusses different forms of (violent) conflict ranging from interpersonal conflict to inter-communal and organized armed conflict (Koubi, 2019). Regarding the geographical scale, this research covers the whole of Mali and a range of examples and cases from around the country will be used to exemplify involved dynamics.

The paper is structured as follows, consequent to this introduction, a thorough literature review engages with current knowledge on the various pathways linking CC and conflict as well as with existing evidence. Next, the methodology applied in this research paper will be elaborated on. The following analysis discusses in detail the many linkages of CC and conflict in Mali. The section culminates with some consequent policy considerations and guidelines. The paper ends with a conclusion.

2. Literature Review

2.1 Pathways linking CC and conflict

The pathways and relationship between CC impacts and conflict are highly diverse and complex. In general, there are both direct and indirect pathways (Koubi, 2019). The main idea behind the direct pathway is that CC causes resource scarcity, which leads to competition over these resources and conflict. In reference to the resource scarcity and population theory of Thomas Malthus, this reasoning has been

coined Neo-Malthusian. The classical example is competition for water. In theory, such competition can be both inter- and intra-state. However, these conflicts have so far only been local and no large-scale water wars (Nordås & Gleditsch, 2007; Bernauer et al., 2012; Koubi, 2019). In addition to scarcity conflicts, several authors also point towards the risk of conflicts due to abundance. An often cited example are potential conflicts around newly available resources or trade routes in the (Ant)arctic becoming available due to melting ice caps (CNA corporation, 2007; Koubi, 2019).

However, critics see such direct pathways as overly deterministic and stress the importance of CC as an indirect conflict factor (Bernauer et al., 2012). In practice, the impact of CC on conflicts is therefore highly dependent on local factors, existing vulnerabilities, and the interplay of many elements. These factors include economic performance, governance effectiveness, or social factors like ethnicity or migration (Scheffran et al. 2012; Huntjens & Nachbar, 2015). One core economic vulnerability is a society's dependence on agriculture. This is particularly problematic if it coincides with other vulnerabilities, such as wide-spread poverty. Given the CC-sensitivity of agriculture, effects such as drought or extreme weather have especially immediate consequences (Nordås & Gleditsch, 2007). CC can for example indirectly influence conflicts by impacting agricultural output which causes rising food prices, which have been described as a crucial conflict driver. Longer-term consequences can be depressed economic development and reduced wages and ultimately increased crime and conflict (Koubi, 2019; Abel et al., 2019). Such developments can be especially vicious if constantly high food prices and scarcity lead people into the arms of rebel groups (Nordås & Gleditsch, 2007). However, also in this context, abundance can be a central factor. Selby & Hoffmann (2014) argue that only the abundant availability of certain resources makes conflict and sustained violence possible. While referring to resources like 'blood diamonds', the same counts for natural CC-sensitive resources as freshwater or fertile land.

A range of authors stress the criticality of governance as a vulnerability factor (e.g. Huntjens & Nachbar, 2015; Koubi, 2019). The ability of a government to react to CC impacts, e.g. a natural disaster or drought, greatly impacts their long-term consequences and conflict potential. Although most authors agree that successful adaptation to CC is core in reducing the conflict risk induced by CC, governance effectiveness is key for achieving long-lasting decreased vulnerability. Poor countries often lack this effectiveness (Bernauer et al., 2012; Huntjens & Nachbar, 2015). Also, ineffective CC adaptation and mitigation can have reverse impacts, for example by creating new or enforcing existing inequalities. A common example is that the increased usage of biofuels leads to competition for fertile land between food- and energy-oriented agriculture (Scheffran et al., 2012; Huntjens & Nachbar, 2015). Moreover, in a mutual relationship, CC can also influence governance effectiveness. Koubi (2019) argues that CC can lead to reduced economic performance, which leads to reduced government revenue and the inability to provide for the people. Consequently, new conflicts may erupt. Such developments can be especially problematic for autocratic regimes relying on providing for certain groups in exchange for stability (Nordås & Gleditsch, 2007; Koubi et al., 2019). Furthermore, reduced revenues can also lead to a decreased ability to fight counter-insurgency, possibly prolonging and intensifying existing violent conflicts (Koubi, 2019).

Raleigh (2010) constitutes ethnicity to be another central aspect determining the conflict-inducing potential of CC. Adding to established pathways, competition for scarce resources is more likely to evolve

into conflict if also ethnic tensions are involved. Especially in many African countries, the political relevance of an ethnic group determines the state's allocation of resources for CC adaptation or disaster relief. As a result, politically irrelevant groups are often highly exposed to the effects of CC. The result can be low-scale violence or migration.

There seems to be agreement that CC can exaggerate migration. Many CC effects can be relevant in this context, e.g. resource scarcity (e.g. freshwater) or natural disasters. Also, sea-level rise makes highly populated coastal areas inhabitable or salinates the groundwater (CNA corporation, 2007; Huntjens & Nachbar, 2015). According to Huntjens & Nachbar (2015) up to 27 million people are annually displaced only due to natural disasters. However, Abel et al. (2019) argue that CC effects are mostly just one reason for migration among others, including political or economic reasons. However, these reasons and respective conflicts can partly be related to CC. Also the pathways of migration leading to conflict have been debated. While it is possible that refugees and migrants might be polarized to join one side in existing or developing conflicts, the likelihood, especially for climate refugees, has been described as low (Nordås & Gleditsch, 2007). However, it has also been argued that conflict can arise of migrants and locals competing for scarce resources. Also in this context, existing vulnerabilities, including the economic performance of the host community and especially the ethnicity of both groups play a significant role (Bernauer et al., 2012; Koubi, 2019; Abel et al., 2019). Von Uexkull & Buhaug (2021) argue that actually both the migrant and host population can fall into social unrest and that this accounts not only for trans-boundary, but also for rural-to-urban migration.

2.2 Empirical evidence of the links between CC and conflict

Despite the logic behind these diverse and interlinked pathways, the empirical evidence linking CC and conflicts is very mixed (Scheffran et al., 2012). Notwithstanding these mixed results, Hsiang & Burke (2014) see an overall support for the positive link between CC and conflict. Starting with historical studies, the fall of the Maya empire and Angkor have for example been attributed to climatic and consequent environmental changes (drought). In Europe, cold periods, as the little ice-age, have been associated with increased violent conflicts. For modern times, a couple of studies on Africa link CC indicators (precipitation change, drought, temperature increase etc.) to more conflicts, but also point towards other factors such as the role of diseases. On a global scale, years with high temperature saw more irregular leadership changes (e.g. coups). Moreover, in El Nino years, the risk of conflict dramatically increased, especially in poor countries (Hsiang & Burke, 2014; Levy et al., 2017). While many historical studies show the link between CC and conflict, current studies are less clear (Scheffran et al., 2012). It should be noted that other (review) studies found only mixed or even no links between CC impacts and increased conflicts (Levy et al., 2017; Koubi, 2019). Mach et al. (2019) argue that so far CC is only one (rather minor) conflict driver. However, this might change as CC gets increasingly substantial and influential on many dimensions. The authors concluded that the risks for conflict increase by 5% given a global temperature increase scenario of 2°C, but by 26% in the 4°C scenario. Moreover, Scheffran et al. (2012) argue that while the number of conflicts has been decreasing for years, it has started increasing again in the last years. The intensifying effects of CC might be one reason for this.

There is general agreement that the relations between CC and conflict are very diverse, intermediate and uncertain. However, the diversity of study outcomes has also been attributed to shortcomings inherent to quantitative studies, which account for about 60% of all studies conducted in the field (Ide, 2017). First, the different studies use very different spatial and time scales, which hinders comparability and raises questions about the actual suitability of the chosen scales (Ide, 2017; von Uexkull & Buhaug, 2021). Also, using variables such as precipitation or temperature for CC effects could be problematic. Koubi (2019) for example argues that extreme rainfall might hinder violent conflict and rebel activities from a logistical perspective but still enhances the conflict risk. However, if a too short time-scale is used this might not be accounted for in the data. Second, many statistical models have been criticized for not accounting sufficiently for the described complex relations making conclusions on the actual importance of CC difficult (Scheffran et al., 2012). Third, the used data has been criticized. For example, only including conflicts with more than 25 deaths might exclude relevant small-scale violent conflicts. Also, on many especially CC sensitive but remote areas data on (small-scale) conflicts is missing (Scheffran et al., 2012; Ide, 2017; von Uexkull & Buhaug, 2021). To overcome some of these shortcomings and especially to account for local conditions and vulnerabilities, qualitative case- and mixed-method studies have been suggested and conducted (Ide, 2017).

An often cited case study example is the conflict in Syria, lasting since 2011 (Abel et al., 2019). Since 2007, the region has suffered from a multi-year drought. Coupled with bad water management, this resulted in crop-failure threatening the livelihood of many farmers and leading to food insecurity. As a consequence, many migrated to the cities where they largely faced unemployment. Two to three million people lived in extreme poverty (Gleick, 2014; Huntjens & Nachbar, 2015; Abel et al., 2019). Gleick (2014) argues that this dynamic has been a significant driver of the social unrest which eventually resulted in Syria's vicious civil war. Huntjens & Nachbar (2015) see it as one factor motivating many (young) people to join extremist groups. However, the fact that the multi-year drought had so tremendous consequences only in Syria and for example not in the neighboring Jordan has mainly been attributed to Syria's specific situation. CC multiplied existing pre-conditions for a conflict, namely a repressive but ineffective regime, ethnic tensions and a weak economic situation (Gleick, 2014; Abel et al., 2019).

Another classical case-study is Sudan's Darfur region. Here, droughts and desertification resulted in the southward migration of nomads where they clashed with local farmers. "Coupled with population growth, tribal, ethnic, and religious differences, the competition for land turned violent" (CNA corporation, 2007, p. 15). However, for Selby & Hoffmann (2014) contextual factors were more important than CC effects. In particular, they stress that at the height of the conflict, rainfall was abundant. For them, the problem has not been absolute but relative resource scarcity and weak and failing governance.

2.3 CC as a "conflict multiplier"

In conclusion, it can be argued that the pathways linking CC and conflict are highly diverse and case specific. However, it seems reasonable to argue that "owing to multiple interconnected and cross-sectoral pathways, the cumulative impact of climate change is much greater than the sum of its impacts" (Levy et

al., 2017, p. 251). Hence, CC can be defined as a conflict multiplier. It exploits vulnerabilities and “exacerbate[s] existing or create[s] new socioeconomic stresses” (Huntjens & Nachbar, 2015, p. 2). This makes the outbreak and escalation of (violent) conflicts far more likely as CC infers with major drivers for conflict (Mach et al., 2019).

3. Methods

3.1 Research Design

As mentioned earlier, the majority of studies at the intersection of CC and conflict are quantitative (Ide, 2017). The research design applied to this research falls into the second main approach, namely qualitative case studies. Such studies allow analysis spanning wider spatio-temporal scales while being best suited to disentangle location and case specific factors, and also account for local interpretations of reality (Ide, 2017; Mohajan, 2018). However, disadvantages include the costs and difficulties of conducting field work in conflict areas, the potential biases arising from the reliance on local opinions and interpretations as well as the potential failure to recognize underlying subconscious patterns (Ide, 2017; Mohajan, 2018). To overcome some of the downsides of both quantitative and qualitative research designs, Ide (2017) promotes the use of more innovative mixed methods approaches.

Unfortunately, it was not within the scope of the research presented in this paper to conduct such an original mixed methods study. However, steps were taken to ensure that this research succeeds in painting the most detailed picture of the relations between CC and conflict in Mali. The information gathered from qualitative questionnaires were enriched by information stemming from the wealth of existing literature on the topic. The range of sources used include qualitative studies (see for example Walch (2019)), quantitative studies (see for example Diallo et al. (2020)) and even mixed method studies (see for example Benjaminsen et al. (2012)).

Among qualitative research methods, questionnaires typically feature less prominently than interviews. In general, “questionnaires pose standardized, formally structured questions to a group of individuals” (McGuirk & O'Neill, 2016, p. 246). For this research, questionnaires with solely open questions were used. Similar to in-depth interviews, they “make [...] it possible to pose complex questions that can reveal people’s experiences, understandings, and interpretations of social processes and circumstances [...] as well as their reactions to them” (McGuirk & O'Neill, 2016, p. 252). Questionnaires have a range of advantages making them a good choice for this research. First, they can be easily combined with other approaches, in this case a detailed literature analysis. Second, questionnaires are comparably easy to distribute, hence more people can be reached (McGuirk & O'Neill, 2016). As a result, more responses can be acquired in a shorter time. Moreover, given the scope of this research and the restrictions imposed by the prevailing COVID-19 pandemic, the questionnaire provided a convenient alternative to reach literate participants in several countries while avoiding social contact. Third, McGuirk & O'Neill (2016) see questionnaires as perfectly suited for discussing sensitive topics, as they give participants the privacy and

time to consider all information and their answers. While the role of CC as conflict multiplier in Mali is not a typically sensitive topic, the questionnaire approach still gave participants the flexibility to work on them whenever their schedule allowed them.

3.2 Data collection

Existing literature formed one cornerstone of this research, not only directly for the analysis but also for the design of the questionnaires. To acquire relevant sources, the search engines Google and Google Scholar were used. Important keywords among others included: 'conflict', 'climate change', 'Mali', 'natural resources', 'migration', and 'farmer herder conflict'. Next, the acquired articles and their abstracts were scanned for their relevance, namely if they included relevant information on Mali. Moreover, the references of reviewed literature were scanned for relevant sources. This enabled a deeper understanding of the web of existing literature and current debates. Also some contacted (potential) research participants suggested literature they deemed useful for the analysis. These sources were reviewed with special attentiveness. In the end, this research could draw on a wide range of literature engaging with many dimensions of the topic, aiding the goal of drawing a holistic picture of the relationship between CC and conflict in Mali. Sources included peer-reviewed academic journal articles, chapters in academic books, reports by think tanks, research centers, institutions and organizations as well as some reliable media and news articles.

One key step in the acquisition of data by means of qualitative questionnaires is the selection of an appropriate participant group (McGuirk & O'Neill, 2016). For this research, experts and practitioners in the field were chosen. Two main reasons explain the focus on this target group, instead of for example local Malians. First, potential participants are relatively easy to reach which was in particular important given the scope of this research and the prevailing pandemic. Second, choosing experts as target participants has the advantage of ideally getting unbiased but still interpretive responses. However, given the enormous number of organizations and experts involved in or working on conflicts in Mali, a selection of who to contact was required. Based on factors such as particular relevance, availability of contact information or personal contacts, this selection process was cooperative between the lead researcher and his two supervisors. Due to the confidentiality of this research, the names of the contacted organizations, institutions and experts must not be disclosed. To further increase the range of study participants, initial contacts were asked to provide contact details of other relevant colleagues or experts. Hence a "snowballing" approach enriched the initial target group selection. In the end, a total number of 17 organizations and experts were contacted. 10 replied to the initial email contact. However, five contacts were either not willing or able to participate, or in the case of bigger organizations, did not provide contact details of the responsible office or expert. Therefore, five questionnaires were sent out and four responses were received.

Interestingly, Beiszeley (2019) argued that reaching and researching elites is often impeded by substantial (institutional) hurdles. As a consequence, getting access to this participant group might force researchers to use deception and/or compromise on ethical standards of research. Fortunately, no such explicit

hurdles were encountered in this research. Several institutions and organizations proved rather open. Throughout the entire research project, the highest ethical standards were maintained. The research design itself was officially approved by the Campus Fryslân Ethics Committee.

For McGuirk & O'Neill (2016) considerations regarding the distribution of the questionnaires are crucial and defining for the entire research. For this research, potential participants or organizations were directly contacted by email or if applicable by provided online contact forms. This first email or message contained a detailed description of the research and why the respective person or organization was contacted. Participants were asked if they would be willing to participate in this research by the means of filling in a questionnaire. If applicable, the email kindly asked if people knew of any other potential participants ("snowballing") or if they could forward this email or message to the responsible office or expert respectively. Only if people replied to this first email expressing their willingness to participate they were sent the questionnaire. This procedure ensured highest ethical standards of informed consent and voluntary participation. If no reply was received after two to three weeks and a direct email address was known, a kind reminder was sent. McGuirk & O'Neill (2016) argue that despite being a quick and cheap means of communication, contact via email reduces the ability to guarantee participant's anonymity. However, in this research, participant's names and responses as well as the email contact were only known to the research team and stored safely on a password-protected laptop.

According to McGuirk & O'Neill (2016) the actual questionnaire design and development is a difficult process requiring attention to be paid to many details. In general, a questionnaire needs to be clear, simple and logical. For this research, questions were formulated rather broadly so participants had the freedom to focus their answers on what they deemed important, hopefully also reflecting their professional background. The focus was clearly on participant's opinions hence avoiding guidance towards certain "desirable" answers. Moreover, all sent-out questionnaires were identical, hence guaranteeing equally high standards of questions and formulations and aiding analytical comparability. In total, participants were asked 5 questions, which aimed at logically guiding respondents through the topic (see Appendix). The questionnaire started with questions about the sources of current conflicts in Mali and about risk factors for future conflict. Next, respondents were asked what they see as the main (future) impacts of CC in Mali. Finally, it was asked what role CC plays for current conflicts, and what role it will play in the future. To guarantee that respondents could openly express their opinion and that no important aspect was missed, the questionnaire ended by asking if respondents had any final comments or things they would like to mention.

Additionally, questionnaires should not be too long in order to increase response rate (McGuirk & O'Neill, 2016). In the cover letter, an assumed duration of maximum 30 minutes was indicated. However, one respondent criticized this to be largely underestimated. Admittedly, this particular response was also of outstanding detail and length. Lastly, the cover letter explaining the research's purpose and ethical considerations (e.g. voluntary participation, informed consent etc.) is of high importance (McGuirk & O'Neill, 2016). The cover letter for this research was even officially approved by the Campus Fryslân Ethics Committee (see Appendix). Moreover, all information provided in the letter was already known to the participants by means of the initial email.

3.3 Data Analysis

Pope et al. (2000) note that qualitative research can generate vast amounts of data of which “the researcher has to make sense [...] by sifting and interpreting [it]” (p. 114). In fact, also this, rather small, research generated a quite substantial amount of raw data in the form of participant’s questionnaire responses. Qualitative research approaches the data often inductively, and derives hypotheses from the data (grounded theory). However, the design of this research called for a slightly different approach. Following the explanations of Pope et al. (2000) one could classify this study as an example of applied (policy) research with a more pre-defined aim and clear structure. The questions asked in the questionnaires provide such a sort of structure informed “by a priori reasoning” (p. 116) and existing literature. However, the actual analysis followed the classical inductive approach. The data was scanned for patterns which informed an indexing of themes along analytical categories. Constant reading and re-reading and comparison ensured the congruence of the resulting ‘codes’. In the end five codes, indexing the textual data were identified. They are: ‘conflict history and contextual factors’, ‘resource competition and migration’, ‘governance’, ‘climate change impacts and livelihoods’ and ‘policy considerations’. Finally, Pope et al. (2000) mention that both specified software and the employment of more than one analysts have diverse advantages and disadvantages. For this research, coding and indexing the data was done manually and solely by the researcher, although constant checking with his supervisors guaranteed high quality standards.

4. Analysis and Discussion

Different authors and respondents disagree on the magnitude at which CC accelerates conflicts in Mali. Some see it only as one rather minor risk factor among many other vulnerabilities. In the words of Respondent 1: “Climate change is neither responsible for the military coup nor for jihadist terrorism, organized crime or governance failure”. While this is certainly true, other authors emphasize that both the Tuareg rebellion in the 1990s and the northern uprising in 2012 followed times of drought which, for example, in 2012 left 900.00 people in a food crisis (Mitra, 2017; Kimenyi et al., 2014). Respondent 3 was convinced that “climate change is indirectly contributing to the conflict and this is going to be the case in the future”. It seems clear that in the case of Mali, CC acts as a conflict multiplier in a highly complex web of vulnerabilities, tensions and contextual factors. The following paragraphs aim at disentangling this web to better understand Mali’s “double-burden” of CC and conflict (Hegazi et al., 2021).

4.1 Climate and Livelihoods in Mali

Before diving more specifically into the impact of CC on conflicts, it seems opportune and necessary to discuss the (expected) immediate impacts of CC on the climate and environment in Mali and hence on local livelihoods. Mali spans 4 climate zones (see Figure 1) with huge variations in precipitation ranging

from less than 100mm per year in the North to about 1700mm in the South. Especially the northern and central zones which are current hotspots of violence and conflict, are characterized by highly seasonal and erratic rainfall (Hegazi et al., 2021). Taking a look at the available climate data, different authors reach different conclusions. On the one hand, Diallo et al. (2020) argue that between 2000 and 2009 rainfall has, in comparison to the time between 1920 to 1969, declined by 12%. Furthermore, Walch (2019) claims that over the last 50 years, rainfall in Mali has decreased, according to Kalkavan (2017) by 30% since 1986. On the other hand, Benjaminsen (2020) emphasizes that since the droughts of the 70s and 80s, rainfall has recovered again and even speaks of an observable greening trend in the Sahel. A buzzword recurring in both the literature and the questionnaire responses is 'desertification'. While desertification could have tremendous consequences on local livelihoods, Benjaminsen (2020) points out that the natural movement of the Sahara frontier is not (yet) caused by land degradation and CC but by natural variations in rainfall patterns. In general, climatic conditions in northern and central Mali are challenging, while southern regions, for example Sikasso are blessed with a more favorable partly tropical climate and fertile land and water resources (Marquette, 2020).

Looking ahead, the climate predictions for Mali and the Sahel more broadly are highly diverse, uncertain and partly contradictory (Benjaminsen, 2020; Heinrigs, 2010; Jankowska et al., 2012). A range of factors determine the climate in the area and hence the impact of anthropogenic CC. These include the aerosol loading in the northern hemisphere, to a minor degree atmospheric greenhouse gas concentration and especially the ocean surface temperature in the Atlantic which impacts precipitation levels via the African convergence zone and monsoon (Heinrigs, 2010; Hegazi et al., 2021; Respondent 1). Much uncertainty exists in regards to future precipitation levels, which could, depending on the interlinked climate mechanism and feedback loops lead to either more precipitation in the western Sahel and Mali or less (Heinrigs, 2011; Jankowska et al., 2012). There is considerably less disagreement that CC already leads to an increase in the number and severity of extreme weather events, for example droughts or heavy rainfall causing floods along the major rivers Senegal and Niger (Hummel, 2015; Hegazi et al., 2021; Goulden & Few, 2011). "In 2020, seasonal flooding affected more than 80 000 individuals, damaging over 6000 houses and over 7000 tons of food. These floods led to deaths, injuries and a need for shelter and food" (Hegazi, 2021, p. 38). Observations and predictions regarding temperature are clearer. While estimates vary, temperatures have increased by around 0.8°C since the 1970s (Diallo, 2020). By the end of the century, the Sahel will suffer from an over-proportional increase in temperature of 4°C (Heinrigs, 2010).

The main concern regarding these climate predictions is their negative impact on agriculture and hence local livelihoods. Livelihoods and yearly panning are traditionally oriented along the seasons (see Figure 4) which are expected to become increasingly unpredictable and variable. The aforementioned increase in destructive extreme weather events and increased variability of rainfall can in combination with increased evaporation caused by the rise in temperature severely impact water availability and hence the growing of crops and availability of pastures. The implications for the often small-scale and largely rain-fed agriculture in Mali are tremendous. Only 3% of the land are irrigated and only 14% of Mali's land is arable (Jankowska et al. 2012; Kalkavan, 2017).

“Climate change could lead to changes in crop yield from –17% to 6% in Mali whilst forage yield could decrease by 5–35% and leading livestock animal weights to decrease by 14–16%. These indicate that climate change could, therefore, expose a higher proportion of the Malian population to hunger” (Diallo et al., 2020, p. 311).

Such prospects are in particular worrisome as poverty and malnourishment are already widespread, with 20% of the population facing food insecurity (Diallo, 2020). Mitra (2017) speaks of 3.8 million people in 2017. The annual population growth of 3% only increases the need for already scarce food and fertile land. The current population of about 19 million people is expected to increase to about 45 million in 2050 (Mitra, 2017). Although Mali has the potential to greatly expand its agricultural production through effective adaptation, the already salient conflicts negatively impact agricultural output and longer-term adaptive capacity (Kimenyi et al., 2014). Next to the direct impact on people's food supply, agriculture is also the basis of most people's economic livelihood. Although estimates vary, about 68 % to 80% of the Malian workforce work in agriculture, accounting for about 33% to 50% of the Gross Domestic Product (Diallo, 2020; Mitra, 2017; Hegazi et al., 2021; Kalkavan, 2017; Respondent 4).

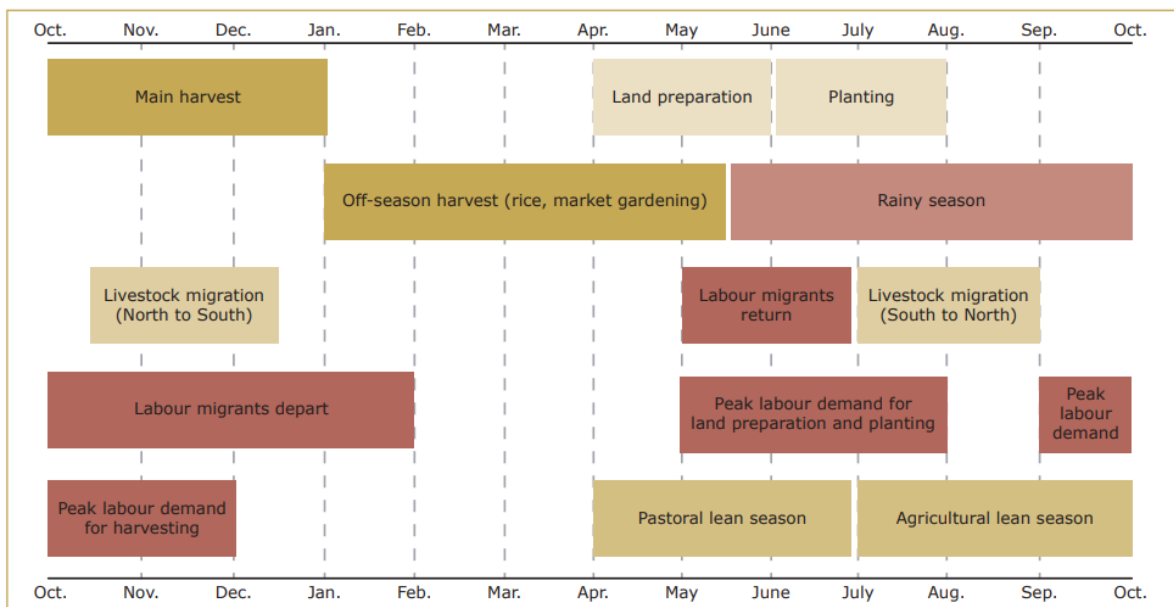


Figure 4: Yearly environment-related livelihood calendar (Hegazi et al., 2021)

4.2 Land use conflicts between herders and farmers

Due to the far-reaching consequences of CC on people’s livelihoods, competition over increasingly scarce natural resources can easily lead to conflict. In this context, both the literature and questionnaire responses refer to the conflicts between (nomadic) pastoralists (herders) and farmers. Such land use conflicts over pastures and crop damage caused by livestock are typical for the Sahel and have occurred for centuries (Nyong & Fiki, 2005). Traditionally, in the rainy season pastoralists and their herds move north, towards rainfed pastures. In the dry season, they move towards more fertile land in the south

and/or at water bodies like the Niger river where farmers grow rice, millet and vegetables (Goulden & Few, 2011). However, since 2012 increasing numbers of pastoralists have moved southwards (Kimenyi et al., 2014). Reasons for this include both the upsurge of violence but also increasing droughts and natural degradation which can at least partly be attributed to CC. This trend and a range of interlinked factors lead to the escalation of violence (Heinrigs, 2010; Respondent 1). This accounts in particular for the Niger Delta and the Mopti region in central Mali (Benjaminsen et al., 2012; Mitra, 2017).

Climate change and governance

Traditional rules and institutions govern the yearly migration of pastoralists. However, while the pressure on these systems constantly grows, both traditional and state governance are weak. Fleeing violence and natural degradation, many herders increasingly enter areas in which they have no traditional ties with the local communities and hence no pre-agreed times of movement, migration corridors or rules for the usage of pastures. Furthermore, the increasing variability of rainfall makes the movement of the herds harder to plan. Also, an increasingly early entry of herders into farmland increases the likelihood of crop damage as harvest might not be yet finished (Walch, 2019; Marquette, 2020; Respondent 2). Governance of these conflicts is increasingly difficult and could even increase tensions instead of lowering them. In the traditional Malian society, property rights are not clearly defined but dependent on customs and the local elites. Efforts by the state to introduce a “modern” legal system were often incomplete and failed. Most state officials and courts left northern Mali during the 2012 uprising and central Mali after increasing conflicts in 2015. However, the courts have always been regarded as resolution mechanisms of last resort due to their corruption. Normally, the group being able to pay the highest bribes wins the case (Benjaminsen et al., 2012; Mitra, 2017; Benjaminsen & Ba, 2019). On the other hand, also the traditional conflict resolution mechanisms built on local chiefs, the Diaros, are increasingly seen as both unable to solve tensions and as contributing to increased conflict. Similar to the courts, they are seen as increasingly partial and corrupt. In cooperation with state officials they tend to ask incoming pastoralists for increasingly high entry fees to the pastures (Walch, 2019).

Another important factor determining the increased tensions between herders and farmers but also the deterioration of traditional mechanisms, are state policies systematically disadvantaging pastoralists (Benjaminsen, 2020). Although nomadic pastoralism is a livelihood perfectly adapted to the climatic condition of the Sahel, already during the French colonial rule, pastoralism was seen as backwards and hindering economic progress. The resulting agriculture-centered development policies have far-reaching consequences. They undermine the traditional sharing of pastures and traditional mechanisms organizing the coexistence of farmer and herder communities (Benjaminsen et al., 2012; Djoudi et al, 2013). The literature largely agrees on the fact that this marginalization of pastoralist livelihoods fuels the grievances which have been described as core reasons for the outbreak and continuation of violence in Mali (Benjaminsen & Ba, 2019). Moreover, these policies and their focus on large-scale agriculture and cash-crops led to an expansion of agricultural area infringing on herders’ feeding and moving grounds. As a result, livestock increasingly damages crops which leads to increased inter-communal conflict (Goulden & Few, 2011; Respondent 2).

The combination of weak and corrupt governance, an increased and unpredictable inflow of pastoralists into agricultural areas and the already existing pressures on agricultural livelihoods (see previous section) in the receiving areas has in recent years led to heightened tensions around land-use and water between herders and farmers (Benjaminsen & Ba, 2019; Goulden & Few, 2011; Kalkavan, 2017; Respondent 1). However, not only a decrease in the availability of natural resources can lead to conflict, but also an increase, for example if communities compete for new land for which no traditional ownership and usage rights exist. Nevertheless, the inflow of small firearms after the war in Libya and the northern Rebellion led to escalating violence in intercommunal land-use conflicts, especially in the central Mopti region (Crawford, 2015). To give an example of the severity of these conflicts, in 2012, a farmer community attacked a pastoralist's village. "350 huts were burnt, 774 cattle taken and 21 villagers killed in addition to several injured" (Benjaminsen & Ba, 2019, p. 14). For the time between 2016 and 2019, the Uppsala Conflict Data Program reported 2123 civilian deaths originating from such intercommunal violence (Walch, 2019).

Ethnicity and Jihadism

Another factor complicating the situation is ethnicity, which is especially important in understanding how small interpersonal conflicts, for example over a pasture, can turn into intercommunal tensions (Ping, 2014). In central Mali, where land use conflicts are most pressing and researched, farmers are typically of the Dogon ethnicity and herders are typically Fulani (Mitra, 2017; Benjaminsen & Ba, 2019; Hegazi et al., 2021). Aided by the discriminatory agricultural policies, the Dogon have been successful in establishing close ties to the government in Bamako. The central government has not only been accused of structurally favoring farming communities and of human rights abuses, but also of supplying weapons to Dogon self-defense units. These groups are responsible for massive human rights violations against pastoralists but also for interethnic violence for example against Dogon communities cooperating with pastoralists. To defend themselves and their herds from attacks and theft, pastoralists are also increasingly armed (Hegazi et al., 2021; Benjaminsen & Ba, 2019; Respondent 2).

In the midst of escalating violence and land use conflicts, jihadist groups have been reported to increasingly exploit local conflicts (Arieff, 2020; Benjaminsen & Ba, 2019). For example, there is evidence that jihadist groups have been especially attractive to Fulani youth who are confronted with almost no opportunities and caught up in a web of old elites and marginalization. To prove their support for the traditional arrangements between the different herder and farmer communities, between 2015 and 2017 jihadists killed more than 30 community leaders (Diallos) in Mopti which they accused of cooperating with the corrupt state (Walch, 2019; Benjaminsen & Ba, 2019). To further their support, extremist groups forced local chiefs to abandon the collection of the highly unpopular fees for incoming pastoralists (Benjaminsen & Ba, 2019). Middendorp & Bergema (2019) also expressed the worry that extremist groups could, like the Islamic State in Iraq, turn increasingly scarce water resources into a weapon by seizing control over its distribution. Furthermore the combination of the absence of governance and state services, including healthcare, education and infrastructure and environmental changes are main reasons for the long-standing grievances and uprisings and leave especially young pastoralists and northerners "unable to survive on their traditional livelihood" (Walch, 2019, p. 3) (Hegazi et al., 2021; Kimenyi et al., 2014; Respondent 4). As a result, they are increasingly forced to join armed groups or criminal

organizations to make a living. Such groups are increasingly present in northern Mali and further undermine the last bits of state authority. They are engaged in kidnappings, smuggling of weapons and drugs and human trafficking (Hegazi et al., 2021; Respondent 1).

The analysis of the complex dynamics of the herder-farmer conflicts in Mali support the call of Benjaminsen & Ba (2019) for a “political ecology approach” (p. 1). Although it is clear that CC cannot be made responsible for the occurrence of bad governance, jihadism or ethnic division (Respondent 1), the herder-farmer conflict clearly shows the role of CC as a conflict multiplier in Mali (Kalkavan, 2017). Although land use conflicts have occurred for decades, CC intensifies them directly through impacting the availability of natural resources (e.g. pastures) and indirectly through driving the migration of increasing numbers of pastoralists. In other words, CC is (potentially) the factor leading to an increasing escalation of violence and conflict in an area already faced with deeply rooted vulnerabilities. It “has the potential to sow (or at least water) the seeds of conflict at different scales” (Goulden & Few, 2011, p. 6).

Southern Sikasso region

Most research regarding land use conflicts focuses on central and northern Mali. However, also the southern regions, most notably Sikasso, are vulnerable to the emergence of increased conflicts. Despite its relative stability, Mali’s “bread basket” faces the risks of weak governance, environmental degradation and hence the spill-over of the northern conflicts (Mitra, 2017; Marquette, 2020). The population in the area is young and growing but largely poor and malnourished. Weak and ineffective governance, fragmented land ownership and inflexible customary structures leave little development opportunities (Diallo et al., 2020; Marquette, 2020). Moreover, unsustainable land use and agricultural expansion, also of cash crops like Cotton, cause soil degradation.

“Climate change is observable in the region through changes in rainfall patterns both in terms of intensity (increase of catastrophic occurrences) and timing (unpredictability of the length of the rainy season). This makes the selection of crops and agricultural planning difficult and adds uncertainty in terms of water availability for pastoralist and sedentary livestock keepers” (Marquette, 2020, p. 14).

Diallo et al. (2020) showed that a complex web of interlinked factors including the availability of livestock and field ownership determine yields and hence people's livelihood and adaptive capacity to increasing CC impacts. Similar to more northern areas, also Sikasso witnesses an increasing inflow of northern pastoralists, which coupled with the discussed risk factors of ethnicity and weak governance can easily escalate into conflicts. Already now, youth groups increasingly “protect” their fields and herds. Furthermore, both herders and farmers increasingly compete for land with real-estate developers from the cities, supporting grievances against the “Bamako elite”. Finally, conflicts over increased live-stock theft, illegal gold mining and land-use have also been mounting at the hardly demarcated borders with Guinea and Côte d’Ivoire. The case of four Gendarmerie officers being killed while trying to de-escalate a trans-boundry conflict over illegal gold-mines exemplifies the potential for conflict and violence (Marquette, 2020).

4.3 Trans-boundary water management

Respondent 1 clearly mentioned that CC is unlikely to cause interstate conflict in the region. However, it should be noted that already today, some of the above-presented trans-boundary land-use conflicts “are often solved only thanks to high-level inter-governmental intervention” (Marquette, 2020, p. 16). Traditionally the literature on conflict and CC paid special attention to the issue of water scarcity and the potential of water wars (Nordås & Gleditsch, 2007; Huntjens & Nachbar, 2015). In the context of Mali, Goulden & Few (2011) highlight the crucial role of the Niger river for both Mali and many neighboring countries. In order to avoid unsustainable practices or management of up-stream users negatively impacting the vital interest of downstream countries and communities, international level management is required. Currently, the ‘Niger Basin Authority’ coordinates trans-boundary river management. However, in the light of increasing agricultural expansion and hence water outtake one could hypothesize that through increased unpredictability of water flows and floods, CC could lead to increased tensions over this shared water resource. However, while no signs of such developments are observable, it should be noted that Nordås & Gleditsch (2007) argued that such challenges could also lead to more cooperation hence reducing the conflict risk.

4.4 Migration

One recurring theme in the literature on CC and conflict is migration. In fact, the explained CC-induced southwards migration of pastoralists is a prime example. Next to this process, Hummel (2015) also attributed the migration of rural youth to the cities as adaptation to population growth and climatic trends affecting rural livelihoods. In addition, Respondent 4 mentioned that the outward migration of labor force could also lead to a “gap in terms of labor-force in community of origins” hence affecting rural and agricultural productivity. Although neither the questionnaire responses nor the literature describe respective developments, one could hypothesize that the increased inflow of migrants to the cities could “put pressure on infrastructure, services and the economy of the receiving area, leading to competition over resources” (Abel et al., 2019, p. 239) like jobs. This risk seems particularly salient, recalling the importance of ethnicity and governance in Mali and Africa more broadly (Raleigh, 2010, Coleman et al., 2021; Respondent 1). Furthermore, CC could indirectly cause increased conflicts and riots in cities like Bamako by directly causing a decline in agricultural output and hence rising food prices or by multiplying land-use conflicts, which in turn lead to decreasing agricultural output and hence rising food prices and migration (Kimenyi et al., 2014; Respondent 1). According to Crawford (2015), the same dynamics are at play in the context of trans-boundary migration, which according to Hummel (2015) is becoming an issue of concern for both Mali and other (Sahel) countries as receiving-, and transit-countries to the European Union.

4.5 Governance of Adaptation

As shown above, governance is a crucial risk and conflict factor in Mali, for example in regards to the provision of social services or the resolution of land-use conflicts. However, also the governance of adaptation to environmental and climatic change deserves attention. While effective adaptation is regarded as key in reducing the conflict inducing risk of CC in Mali, adaptation must be conflict sensitive in order to not heighten existing conflict risks (Scheffran et al., 2012). In other words, not only CC, but faulty adaptation to its (predicted) impacts can accelerate conflicts. Benjaminsen et al. (2012) discuss the reconstruction of an old dam in Mopti with the aim of increasing water availability for both farmers and pastoralists. However, members of the agricultural community built vegetable gardens at the shores of the new lake, hence blocking access for herders' livestock. Pastoralists saw this as an outright provocation against the agreement on equal usage of the dam. This example clearly shows how mismanaged adaptation can lead to increased and not reduced conflict as a result of the increased availability of resources. The same accounts if for example increased water availability attracts increasing numbers of migrants, for example pastoralists from further away, hence increasing tensions with the locals (Goulden & Few, 2011). To give another example, the Sélingué hydro power dam at the Niger river aims at producing (green) energy but also at regulating the water stream, which seems opportune given that CC likely leads to increasingly varying water flows (floods and droughts) and that many farmers depend on stable water levels for their rice-fields. However, in 2001, due to an unexpected flood and artificially too high water levels the dam needed to be opened leading to massive destruction at downstream fields and houses. Instead of regulating the water flow, mis-management caused increased destruction and severely impacted peoples' livelihoods hence increasing the conflict risk (Goulden & Few, 2011).

Furthermore, some of the development projects administered by MINUSMA have been characterized as unsustainable. For example, to increase local water supply in times of drought, an increasing amount of boreholes are drilled. However, this method of CC adaptation not only increases local water supply and hence supports local livelihoods, but also attracts increasing numbers of people and livestock further degrading the local vegetation, which "may create long-term problems" (Hegazi et al., 2012, p. 41) instead of solving them. Djoudi (2013) discusses another example of mismanaged adaptation. To provide additional livelihoods for people inhabiting an area around a drying lake close to Timbuktu, in the 1980s a non-governmental organization planted *Prosopis* trees in order to avoid desertification and allow people a more diverse livelihood based on the forest. However, the non-endemic *Prosopis* grew so quickly and densely that locals hardly benefitted as they could only use the outskirts of the forest to collect firewood or graze their livestock. Although one could argue that such mistakes might not be made anymore nowadays, it shows the consequences of badly-planned adaptation to CC impacts such as the drying of a lake.

In the context of bad governance and adaptation, also the Malian forest guards deserve attention. Originally, the forest service was formed to preserve the forests' natural protecting function against desertification and land-degradation. Also international donors and institutions supported this attempt of climate adaptation and one could even argue mitigation. However, nowadays, the forest guards "are widely seen as displaying predatory behavior through taxing or imprisoning, for instance, random women

wood collectors or herders who are accused of causing desertification” (Benjaminsen & Ba, 2019, p. 10). Despite the constant retreat of state agencies especially from central Mali, the number of forest officers increased. However, several forest guards have already been killed, also by jihadist groups claiming to “protect” the locals (Benjaminsen & Ba, 2019). Also in the southern Sikasso region, tensions around the forests are mounting. For example, in order to test the state’s willingness to protect the forests, local chiefs increasingly tell newly incoming pastoralists to feed their livestock at these protected forests. This could increase the likelihood and severity of conflicts between communities and the state (Marquette, 2020). In conclusion, one could see the forest guards as another example of failed adaptation governance, because they directly and indirectly increase local tension and conflict. Even from an environmental perspective, their work can be described as unsuccessful, according to Respondent 1, 60% of protected forests in Mali have disappeared.

4.6 Direct impacts on military activities

Hegazi et al. (2021) point towards a problem often receiving little attention in the debate of CC and conflict, namely the direct impacts of CC on military activities. In particular, the already rough and likely worsening natural conditions, especially in northern Mali, can directly restrain military activities of the peacebuilding and counter-insurgency forces of MINUSMA and the French Barkhane mission. Increasing temperatures and sand storms negatively impact camp protection and the usage of military equipment like helicopters which are unable to fly under such conditions. Moreover, heavy rainfall and floods can severely damage the infrastructure. As a result, the ability of (inter)national forces to move around is severely impacted. While a CC-induced increase in such extreme weather also affects local insurgency and terrorist groups, the impact on their actions is less. Typically, they are less heavily armed and know the area very well, allowing them to move at night when it is cooler. “In central Mali, for example, armed non-state actors are equipped with boats and motorcycles that enable them to move quickly and attack during the rainy season” (Hegazi et al., 2021, p. 30). The report of the UN Secretary General (2021) already highlights the increased threat posed by such asymmetric attacks. In short, if CC leads to an increase in extreme weather events, it could highly impact the efforts of (inter)national forces to bring back state control and security to many Malian provinces, which is seen as a precondition for effective peacebuilding.

4.7 Policy Considerations

Although it would blast the scope of this paper to go into detail on specific policy recommendations addressing the complex and interlinked issues of CC and conflict in Mali, the following section aims at providing a brief overview of relevant considerations. Starting on a global level, Respondent 3 mentioned that the fight against CC, hence the reduction of global greenhouse gas emissions, should be one priority. While there can be no denying that the fight against global CC needs to be a global priority, Respondent 1 warned of the view that combating CC would solve the conflicts in Mali. In fact, the same respondent was very pessimistic about the current situation, describing Mali as a failed state in which neither military interventions nor large-scale development projects have yielded sustainable success. Other experts have

been more optimistic. One key policy consideration recurring in both the literature and the questionnaires concerns the better understanding and mapping of the complex climate and conflict risks in Mali to inform targeted actions (Coleman, 2021; Mitra, 2017). This paper can be considered as a thorough step in this direction.

Furthermore, in order to better address the interlinked challenges of CC and conflict, Hegazi et al. (2021) demand a wider and more detailed mandate for MINUSMA. In addition, better coordination and cooperation between different actors and levels of governance is a necessary step (Middendorp & Bergema, 2019; Hegazi et al., 2021), also for addressing the migration issue (Hummel, 2015). Marquette (2020) sees the improvement of coordination and the build-up of necessary capacities as the main task of Mali's international partners. However, there is clear agreement throughout all consulted sources that policies aiming to address the role of CC as a conflict multiplier in Mali must focus on the local level and strengthen local resilience to CC and conflicts. Consequently, more specific policies should ideally form part of a greater, integrated response. "A focus on building resilience and supporting the ability of the population to adapt is often more appropriate than seeking to promote specific adaptation strategies at the local level" (Goulden & Few, 2011). First, Benjaminsen et al. (2012) stress the importance of improving local governance as a precondition for the development of lasting stability and resilience. However, given the current levels of state failure and unrest, achieving this goal seems almost illusory. The same accounts for the proposal of Ping (2014) to strengthen democracy by making elections truly inclusive and not just an 'ethnic census'. To support this, pastoralists and their livelihoods should be better represented and valued (Kalkavan, 2017). Second, two respondents mentioned explicitly that local measurements should be clearly community-based and informed by local needs. This seems in particular necessary to avoid mal-adaptation (Djouidi et al., 2013). Mitra (2017) stresses the importance of preventing conflicts before they occur. According to Walch (2019) and Respondent 4, strengthened and impartial local conflict resolution forms a central part. Third, agricultural resilience and food security are key in addressing the conflict inducing potential of CC (Kimenyi et al., 2014). Specific policy measures, also and in particular in times and areas of conflict, include the supply of necessary equipment (e.g. water pumps), materials (e.g. fertilizers) and financial means (e.g. credits) needed for adapting local livelihoods (Kimenyi et al., 2014; Respondent 4). Moreover, the awareness of the risks of CC should be strengthened among farmers and pastoralists. Better access to information and weather forecasts could greatly improve local adaptive capacity (Heinrigs, 2010; Diallo et al., 2020).

5. Conclusion

This paper set out to analyze and discuss the role of climate change as a conflict multiplier in Mali. Since the intensification of the debate around the linkages between CC and conflict from 2007 onwards, a range of studies aimed to examine the links using an array of methodological and logical approaches. Over the years, no clear conclusion has been reached. Faced with a long history of conflicts, failed governance, instability and military coups, with the most recent in May 2021, Mali is an ideal case to study the

interaction of CC with existing vulnerabilities and tensions, aiding the outbreak, prolonging and intensification of conflict. The careful analysis of the case study of Mali shows evidence of both direct and indirect pathways linking CC and conflict. Climate predictions for the country are highly uncertain. However, in combination with negative impacts of ongoing conflicts and population growth, CC endangers local livelihoods. First, CC is likely to cause an increased scarcity of natural resources such as fertile land leading to increasing land use conflicts especially between nomadic pastoralists and farmers. Existing tension and risk factors include ethnic divide, historic grievances and ineffective and partial governance. Furthermore, jihadist groups exploit these risks to their advantage hence intensifying conflicts at different scales. In other words, while these conflict risks have also existed without CC, its increasing pressure multiplies current conflict (risks). Second, increasingly unpredictable precipitation might trigger increased international tensions over shared water bodies such as the Niger river. Third, CC interacts in diverse ways with (urban) migration, which in turn can be both a direct and indirect conflict factor. Fourth, various examples from Mali show the conflict-inducing potential of faulty adaptation projects. In other words, adaptation to the risk of CC can be a conflict risk in itself. Fifth, a CC-induced increase in extreme weather events can restrict national and international military efforts hence further complicating the goal of bringing stability to the conflict-ridden country. Lastly, based on these findings, a range of policy considerations and guidelines were presented. A particular focus should lie on bettering the coordination between all involved entities and on local resilience building. Conflict- and climate-sensitive and inclusive local actions should aim at increasing local resilience.

Overall, the analysis clearly shows the complexity and local specificity of the interrelation between CC and conflict. This paper can be considered an important contribution in further understanding this complex relationship, which is crucial for the development of effective and sustainable countermeasures. Although there can be no denying that CC alone is not a sufficient explanation for the outset, continuation and spread of violence and conflict in Mali, CC is clearly an important factor multiplying the conflict and will increasingly be in the future. Future research could further investigate the implications of the Mali case for other countries, hopefully drawing important lessons on the relation between CC and other risk factors common to many countries in the Sahel and worldwide. Sir David Attenborough called CC “our greatest threat in thousands of years”. Consequently, interdisciplinary research has many reasons to increasingly investigate the highly dynamic and subtle interlinkages of CC and conflict and focus on the many relevant geographical areas (e.g the (Ant)arctic) (von Uexkull & Buhaug, 2021; Respondent 1). Referring back to the introduction, (inter)national policy makers and organizations (e.g. UN missions) should more specifically account for the multifold security dimension of CC in both their actions and mandate (Hegazi et al., 2021).

6. References

- Arieff, A. (2020) *Crisis in Mali*. Congressional Research Service.
<https://crsreports.congress.gov/product/pdf/IF/IF10116>
- Abel, G. J., Brottrager, M., Cuaresma, J. C., & Muttarak, R. (2019). Climate, conflict and forced migration. *Global Environmental Change*, 54, 239-249. <https://doi.org/10.1016/j.gloenvcha.2018.12.003>
- Benjaminsen, T. A. (2020) Does climate change lead to conflicts in the Sahel? In Behnke, R. H. & Mortimore, M. (Eds.) *The End of Desertification? Disputing Environmental Change in the Drylands* (pp. 99-116). Springer.
- Benjaminsen, T. A., Alinon, K., Buhaug, H., & Buseth, J. T. (2012). Does climate change drive land-use conflicts in the Sahel? *Journal of peace research*, 49(1), 97-111. DOI: 10.1177/0022343311427343
- Benjaminsen, T. A. & Ba, B. (2019) Why do pastoralists in Mali join jihadist groups? A political ecological explanation. *The Journal of Peasant Studies*, 46(1), 1-20.
<https://doi.org/10.1080/03066150.2018.1474457>
- Bernauer, T., Böhmelt, T., & Koubi, V. (2012). Environmental changes and violent conflict. *Environmental Research Letters*, 7(015601), 1-8. <http://dx.doi.org/10.1088/1748-9326/7/1/015601>
- Beizsley, D. (2019) Researching elites at the margins of research ethics frameworks. *Tijdschrift over Cultuur en Criminaliteit*, 9(2), 37-51. DOI: 10.5553/TCC/221195072019009002003
- CNA corporation (2007) *National security and the threat of climate change*.
https://www.cna.org/cna_files/pdf/national%20security%20and%20the%20threat%20of%20climate%20change.pdf
- Coleman, J., Dal Santo, E., Demuynck, M., Vellage, L., & Vermeersch, E. (2021) *Dynamics of support and engagement: Understanding Malian youths' attitudes towards violent extremism*. United Nations Interregional Crime and Justice Research Institute (UNICRI) & International Centre for Counter-Terrorism – The Hague (ICCT).
https://icct.nl/app/uploads/2021/02/Merit_quantitative_web.pdf
- Crawford, A. (2015) *Climate change and state fragility in the Sahel*. FRIDE, Policy Brief N° 205 - JUNE 2015. <https://www.iisd.org/system/files/publications/climate-change-and-state-fragility-in-the-Sahel-fride.pdf>

- Diallo, A., Donkor, E., & Owusu, V. (2020). Climate change adaptation strategies, productivity and sustainable food security in southern Mali. *Climatic Change*, 159, 309-327. <https://doi.org/10.1007/s10584-020-02684-8>
- Djoudi, H., Brockhaus, M., & Locatelli, B. (2013). Once there was a lake: vulnerability to environmental changes in northern Mali. *Regional Environmental Change*, 13, 493-508. <https://doi.org/10.1007/s10113-011-0262-5>
- Gleick, P. H. (2014). Water, drought, climate change, and conflict in Syria. *Weather, Climate, and Society*, 6, 331-340. DOI: 10.1175/WCAS-D-13-00059.1
- Goulden, M. C., & Few, R. (2011). *Climate change, water and conflict in the Niger River Basin*. International Alert and University of East Anglia. https://www.international-alert.org/sites/default/files/ClimateChange_WaterConflictNigerRiver_EN_2011.pdf
- Hegazi, F., Krampe, F., & Seymour Smith, E. (2021) *Climate-related security risks and peacebuilding in Mali*. SIPRI Policy Paper No. 60. <https://www.sipri.org/sites/default/files/2021-04/sipripp60.pdf>
- Heinrigs, P. (2010) *Security implications of climate change in the Sahel region: Policy considerations*. OECD. <https://www.oecd.org/swac/publications/47234320.pdf>
- Hsiang, S. M., & Burke, M. (2014). Climate, conflict, and social stability: what does the evidence say?. *Climatic Change*, 123, 39-55. DOI 10.1007/s10584-013-0868-3
- Hummel, D. (2016) Climate change, land degradation and migration in Mali and Senegal – some policy implications. *Migration and Development*, 5(2), 211-233, DOI: 10.1080/21632324.2015.1022972.
- Huntjens, P., & Nachbar, K. (2015) *Climate change as a threat multiplier for human disaster and conflict*. The Hague Institute for Global Justice, Working Paper 9. <https://www.thehagueinstituteforglobaljustice.org/wp-content/uploads/2015/10/working-Paper-9-climate-change-threat-multiplier.pdf>
- Ide, T. (2017). Research methods for exploring the links between climate change and conflict. *Wiley Interdisciplinary Reviews: Climate Change*, 8, 1-14. DOI: 10.1002/wcc.456
- Jankowska, M. M., Lopez-Carr, D., Funk, C., Husak, G. J., & Chafe, Z. A. (2012). Climate change and human health: Spatial modeling of water availability, malnutrition, and livelihoods in Mali, Africa. *Applied Geography*, 33, 4-15. <https://doi.org/10.1016/j.apgeog.2011.08.009>
- Kalkavan, B. (2017) *Climate change, inequality and conflict: Approaches to strengthen Mali's Climate Change Adaptation*. Planetary Security Initiative.

https://www.planetarysecurityinitiative.org/sites/default/files/2017-12/PB_Climate%20change%20inequality%20and%20conflict.pdf

Kimenyi, M., Adibe, J., Djiré, M., Jirgi, A. J., Kergna, A., Deressa, T. T., Pugliese, J. E., & Westbury, A. (2014) *The impact of conflict and political instability on agricultural inverszemnst in Mali and Nigeria*. Brookings Institute, Africa Growth initiative Working paper 17. https://www.brookings.edu/wp-content/uploads/2016/06/14-07-22-impact-of-conflict-malinigeria_final.pdf

Koubi, V. (2019). Climate change and conflict. *Annual Review of Political Science*, 22, 343-360. <https://doi.org/10.1146/annurev-polisci-050317-070830>

Levy, B. S., Sidel, V. W., & Patz, J. A. (2017). Climate change and collective violence. *Annual review of public health*, 38, 241-257. <https://doi.org/10.1146/annurev-publhealth-031816-044232>

Mach, K. J., Kraan, C. M., Adger, W. N., Buhaug, H., Burke, M., Fearon, J. D., ... & von Uexkull, N. (2019). Climate as a risk factor for armed conflict. *Nature*, 571, 193-197. <https://doi.org/10.1038/s41586-019-1300-6>

Maiga, A. & Marquette, C. (2021, March 21). *Mali needs climate solutions, not more troops*. Aljazeera. <https://www.aljazeera.com/opinions/2021/3/31/mali-needs-climate-solutions-not-more-troops>

Marquette, C. (2020). *Maintaining peace and stability in Mali's Sikasso Region*. International Alert. https://www.international-alert.org/sites/default/files/Mali_MaintainingPeaceAndStability_EN_2020.pdf

McGuirk, P. M. & O'Neill, P. (2016). Using questionnaires in qualitative human geography. In I. Hay (Ed.), *Qualitative Research Methods in Human Geography* (pp. 246-273). Don Mills, Canada: Oxford University Press.

Middendorp, T., & Bergema, R. (2019). *The warning signs are flashing red: The interplay between climate change and violent extremism in the Western Sahel*. Planetary Security Initiative & ICCT. https://icct.nl/app/uploads/2019/10/PB-The-Warning-Signs-are-flashing-red_2e-proef.pdf

Mitra, S. (2017). *Mali's fertile grounds for conflict: Climate change and resource stress*. Planetary Security Initiative. https://www.clingendael.org/sites/default/files/2017-12/PB_Malis_Fertile_Grounds_for_Conflict.pdf

Mohajan, H. K. (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, 7(1), 23-48. <https://mpr.ub.uni-muenchen.de/85654/>

- Nordås, R., & Gleditsch, N. P. (2007). Climate change and conflict. *Political Geography*, 26; 627-638. DOI:10.1016/j.polgeo.2007.06.003
- Nyong, A., & Fiki, C. (2005). *Drought-related conflicts, management and resolution in the West African Sahel*. International workshop on Human Security and Climate Change, Oslo.
- Raleigh, C. (2010). Political marginalization, climate change, and conflict in African Sahel states. *International studies review*, 12(1), 69-86. <http://www.jstor.org/stable/40730710>
- Pezard, S., & Shurkin, M. (2015) *Achieving peace in Northern Mali: Past agreements, local conflicts, and the prospects for a durable settlement*. RAND Corporation. https://www.rand.org/pubs/research_reports/RR892.html
- Ping, J. (2014). The Crisis in Mali: Outline the course to peace and stability. *Harvard International Review*, 35(3), 22-25. <http://www.jstor.org/stable/42772684>
- Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care: Analysing qualitative data. *British Medical Journal*, 320(7227), 114-116. DOI: [10.1136/bmj.320.7227.114](https://doi.org/10.1136/bmj.320.7227.114)
- Scheffran, J., Brzoska, M., Kominek, J., Link, P., & Schilling, J. (2012). Climate change and violent conflict. *Science*, 336, 869-871. DOI: [10.1126/science.1221339](https://doi.org/10.1126/science.1221339)
- Selby, J., & Hoffmann, C. (2014). Beyond scarcity: rethinking water, climate change and conflict in the Sudans. *Global Environmental Change*, 29, 360-370. <http://dx.doi.org/10.1016/j.gloenvcha.2014.01.008>
- The Economist (2021, May 25). *The leaders of Mali's coup last August do it again*. <https://www.economist.com/middle-east-and-africa/2021/05/25/the-leaders-of-malis-coup-last-august-do-it-again>
- UN Secretary General (2021). *Situation in Mali*. United Nations Security Council Report of the Secretary General, S/2021/299. <https://reliefweb.int/report/mali/situation-mali-report-secretary-general-s2021299>
- Von Uexkull, N., & Buhaug, H. (2021). Security implications of climate change: A decade of scientific progress. *Journal of Peace Research*, 58(1), 3-17. <https://doi.org/10.1177/0022343320984210>
- Walch, C. (2019). *Too partial to work? Informal institutions in the midst of climate change and armed conflict in central Mali*. Uppsala University, Working paper. <https://www.researchgate.net/publication/346021979> Too partial to work Informal institutions in the midst of climate change and armed conflict in central Mali

7. Appendix

Questionnaire on the Relationship between climate change and conflict in Mali

Dear Research Participant,

Thank you very much for participating in this research project. To briefly introduce myself, I am Marc Flessa, a third year Bachelor Student of Global Responsibility and Leadership at Campus Fryslân, University of Groningen. I am conducting this research for my Bachelor thesis under the supervision of Prof. Caspar van den Berg and Alexandre Belloir (MA).

The country of Mali is facing considerable challenges and risks. These range from regional and ethnic tensions to poverty, hunger and jihadist terrorism. Moreover, the volatile Center and Northern regions of Mali form part of the Sahel, which is a recognized climate change hotspot. It is the aim of this research to explore how climate change affects the fragile situation in Mali, how it “exploits” existing risk factors, and how the impacts of climate change can directly or indirectly lead to new conflicts and/or civil unrest.

In light of this, I believe that your insights and knowledge would greatly enrich this project. Your testimonies, as an expert on the topic, will provide valuable information regarding the current situation, and serve to form an accurate depiction of conflict and climate change in Mali.

Participation in this research is completely voluntary and you may terminate it at any time without any consequences or providing any reasons. All data will be stored safely and kept confidential, and hence will not be shared with anyone outside of the research team. Your information will be treated anonymously and shall only be used to conduct this study. No names shall be used, however if you kindly provide me with it, I may use your organizational affiliation and professional title. The Campus Fryslân Ethics Committee has approved this study.

Filling in the questionnaire should take no longer than 30 minutes of your precious time.

By filling in and returning this questionnaire you agree to the above-set terms. Should you have any questions or concerns please do not hesitate to contact me under m.flessa@student.rug.nl.

I greatly value your participation and thank you very much for your help!

Kind regards,

Marc Flessa

Below you can find the 6 questions composing this questionnaire. I am highly interested in all your expertise and knowledge, so please feel free to mention all information, thoughts and examples you deem relevant.

Please note that in this questionnaire and for my research in general, I apply a rather broad definition of (violent) conflict, entailing and ranging from low-scale to interpersonal and collective violence and social conflict.

- 1. What are in your opinion the current main conflicts in Mali and what are their key sources?**

- 2. What are in your opinion current and future risk factors for the outbreak of (more) conflict?**

- 3. What are and will be the main impacts of climate change in Mali?**

- 4. What role does climate change currently play for conflicts in Mali, what will its future role be and why?**

- 5. Which measures should be taken to address current and future climate change related conflicts and civil unrest in Mali?**

- 6. Is there anything else you would like to mention or discuss?**

Once more, thank you very much for your highly valued input!