Exploring Complex Pathways in the Climate Change, Vulnerability and Violent Conflict Nexus: The Case of Alta Verapaz, Guatemala

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Abstract
The climate change and conflict nexus has been the focus of much debate and speculation in academic circles as well as public discourse. Much of the existing research has been undertaken by studies using quantitative methods, which intend to prove or disprove the existence of a causal relationship. However, this approach does little to help inform policy and practice, where a deeper understanding of the mediating factors in the relationship and their interplay is needed. This thesis investigates the climate change – violent conflict nexus within the context of Alta Verapaz, a department in the central highlands of Guatemala. The aim was to conduct an in-depth analysis of the pathways between climate change and violent conflicts in a fragile context by focusing on vulnerability, to identify opportunities to build local resilience to these risks. A mixed methods approach was taken, combining quantitative survey questionnaires and a qualitative dataset of interviews with government officials, NGOs and key informants, as well as grey literature gathered during the fieldtrip. Results indicate that although climate change is having a noted impact on temperature and rainfall in the department and thus on people's livelihoods, inadequate adaptation measures have led to increased vulnerability levels. The political economy in the area has given rise to situations of conflict, rather than stress related to climate change. Conflict drivers include ethnic-based governance, large-scale land acquisition (LSLA) and the presence of extractive industries and hydro-power plants. Climate change acts as an additional stressor in these political and social conflicts by increasing vulnerability.

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Abbreviations

ADRI	Rural Integral Development Association
CNCC	National Climate Change Council
CONRED	National Coordination of Disaster Reduction
CSR	Corporate Social Responsibility
DFID	Department for International Development
EIA	Environmental Impact Assessment
EWS	Early Warning Systems
FONCC	National Climate Change Fund
FSI	Fragile State Index
ILO	International Labour Organisation
INAB	National Institute of Forests
INSIVUMEH	National Institute for Seismology, Volcanology, Meteorology and Hydrology
LSLA	Large-Scale Land Acquisition
IPCC	Intergovernmental Panel on Climate Change
MAGA	Ministry of Agriculture, Livestock and Food
MARN	Ministry of Environment and Natural Resources
MEM	Ministry of Energy and Mining
NAPA	National Adaptation Plans for Action
NGO	Non-Governmental Organisation
UNFCCC	United Nations Framework Convention on Climate Change

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Chapter 1: Introduction

The climate change and conflict nexus has been the focus of much debate and speculation both in the academic literature and in public discourse. Although scholars tend to agree that climate change can potentially increase the risk of conflict (Burrows & Kinney, 2016), the causal structure in narratives is susceptible to remaining oversimplified, as the interplay between different drivers is not sufficiently understood (Kallis & Zografos, 2014). This could result in unwanted consequences such as poorly targeted and designed policy action and unwise investments of resources and efforts.

Much of the research on climate change and its implications for security and violent conflict has been undertaken by works using quantitative methods, which aim to prove or disprove the existence of a causal relationship (Theisen, Gleditsch, & Buhang, 2013). However this approach does little to help inform policy and practice, where a deeper understanding of the mediating factors in the relationship, such as governance mechanisms and institutional factors, is needed (Peters & Vivekananda, 2014). These studies have also been subject to much criticism regarding their methodology and argumentation (Selby, 2014; Theisen, 2017; Vivekananda, Schilling, & Smith, 2014b).

A second approach thus calls for research to focus more on pathways where environmental change interplays with different factors and to investigate where and how factors that increase the likelihood of conflict occurring interact with these processes. The dynamics between environmental change and conflict are specific to each context, which differ in terms of social, economic and political characteristics. Place-based context specific research is necessary in order to gain insights into the drivers of violent conflict (Harris, Keen, & Mitchell, 2013).

In December 2017, The Hague Declaration on Planetary Security - first of its kind in the field of climate change and conflict - was launched, the result of which is an institutional home in the UN for this debate around climate and security. This positive step will hopefully draw the attention of countries and organisations and encourage them to dedicate more attention, resources and efforts in designing policies and implementing concrete programmes which recognize and capture the complexity of the issue.

In response to the need for more focused research, this thesis investigates the interactions between multiple risks in a fragile context, that of Alta Verapaz, a department in the western highlands of Guatemala in Central America. This case provides interesting insights into the

topic for many reasons. Despite the progress made since the 1996 Peace Accords, decades of civil war have left the country fragile, with challenging governance and a country still fragmented across ethnic groups (Sanchez, Scott, & Lopez, 2015). At the same time, Guatemala is facing severe climate risks, including floods, landslides and droughts, which are projected to worsen with climate change (IPCC, 2014b). In fact, Guatemala has been identified as the 11th most climate risk affected country in the world (Eckstein, Künzel, & Schäfer, 2017). Alta Verapaz is the department in Guatemala with the highest proportion of indigenous people, accounting for almost 90 percent of the population (Instituto Nacional de Estadística, 2014). It has the highest levels of poverty and inequality in the country and the population is largely dependent on agriculture as a means of livelihood (FEWS NET, 2016; Sanchez et al., 2015). The area is undergoing political and social conflict triggered by the presence of hydroelectric dams, metal mining and large-scale agriculture projects (Aguilar-Støen & Hirsch, 2015; Wayland & Kuniholm, 2016).

With this context in mind, the overall aim of this thesis is to conduct an in-depth analysis of the pathways between climatic changes and violent conflicts in a fragile context by focusing on vulnerability, to identify opportunities to build local resilience.

In order to achieve this aim, the research has five objectives:

1. Investigate the conceptual understanding of the relationship between climate change, vulnerability and conflict, and develop a framework which includes relevant factors in the relationship.
2. Identify institutions, agreements and frameworks which exist to settle conflicts and govern natural resource management and climate change adaptation; and assess gaps or limitations in their ability to effectively govern in an equitable, collaborative and inclusive way.
3. Investigate the inhabitants and government officials of Alta Verapaz's perception of environmental changes, how these affect them and how they are being managed by governance institutions.
4. Investigate the inhabitants and government officials of Alta Verapaz's perception of the use of violence as an acceptable or necessary means of resolving conflicts.
5. Assess the potential climate related risk factors that could cause violent conflict in the fragile context, to develop a set of recommendations.

To meet these objectives, a mixed methods approach was employed - combining quantitative survey questionnaires and a qualitative dataset of interviews with government officials, NGO members and key informants, as well as grey literature gathered during the data collection stage. It is hoped that insights gained from the Alta Verapaz case study will advance the understanding of the relationship between climate change and violent conflict and contribute some qualitative evidence to the debate. This evidence could serve as a foundation on which further studies can be done to inform more effective policies to reduce vulnerabilities, poverty levels and conflicts globally, as well as guide development interventions to ensure they are both building adaptive capacity as well as peacebuilding.

Chapter 2 starts with a description of the methodology, including data collection methods, data analysis and limitations. In chapter 3, various concepts are explored and related, based on a literature review in the fields of climate change adaptation, climate security and conflict studies. Chapter 4 goes on to present the case study of Alta Verapaz, providing an overview of the economic, social, cultural and political situation as well as a brief historical background. The results are presented and discussed in chapter 5. Here, a description is given of perceived and actual climate change in Alta Verapaz, adaptation and mitigation efforts at institutional, organisational and individual levels and finally of the conflict associated with land grabbing in the department. To conclude, chapter 6 links the case study findings to the wider climate-conflict debate and offers recommendations on how to strengthen resilience to both climate change and the risk of violence in a fragile context.

Chapter 2: Research Methodology

2.1 Approach

The research was carried out using an inductive exploratory approach, based on a triangulation of data sources. The study thus does not seek to test a hypothesis or to validate or disprove a theory, but rather to explore a context and inductively generate a conceptual framework to explain phenomena within the context. Data sources include secondary data from key literature, primary qualitative data collected from interviews and primary quantitative data from a survey. The use of mixed methods in this research supports a rigorous inquiry of the research question by drawing on the strengths of both qualitative and quantitative methods as well as allowing the cross-validation of findings from different sources (Harwell, 2011). Both types of data were collected concurrently and combined during the data analysis stage, to provide different insights on the topic. This chapter provides more details on the different data collection methods, the method used to analyse and interpret the data and limitations and difficulties encountered during the research. A visualisation of the different stages in the research are presented as a diagram in figure 1. The design of the study is centred around a case study of the central highlands of Alta Verapaz in Guatemala, which will be explained further in the chapter: ‘Case Study Presentation’.

2.2 Data collection

2.2.1 Secondary data collection

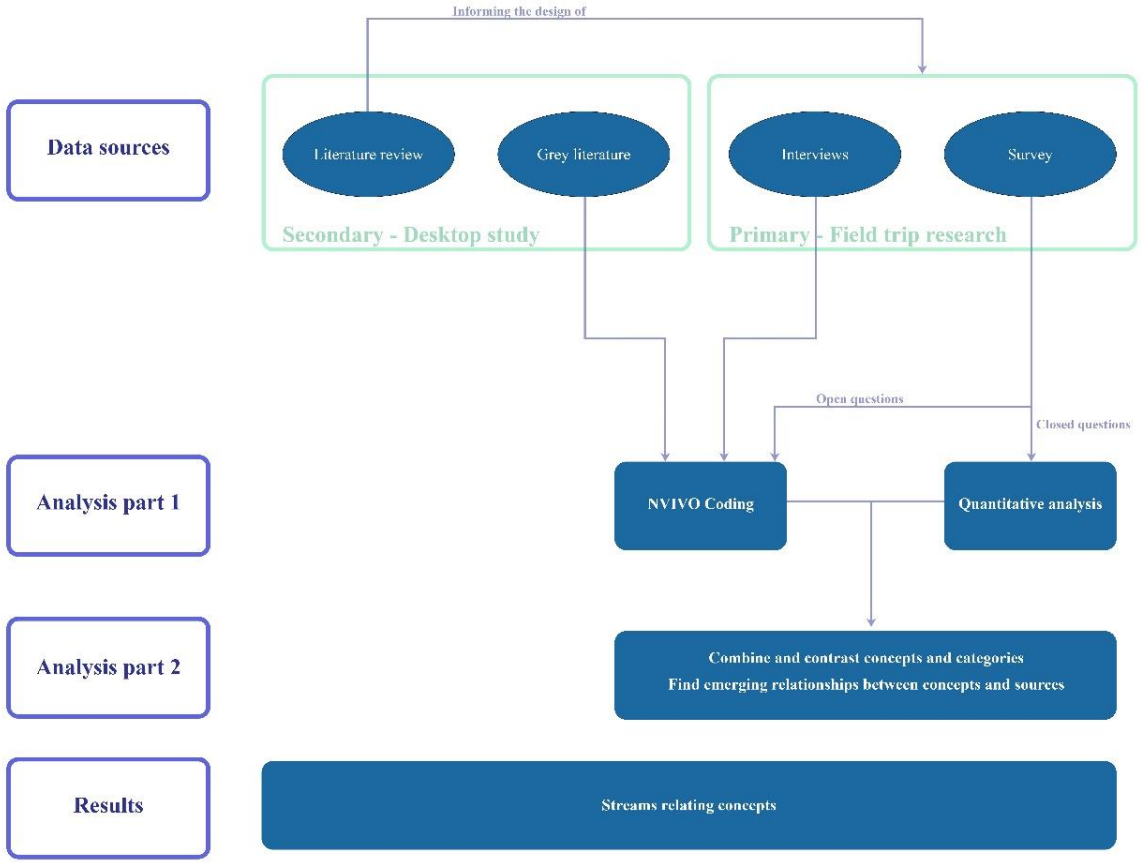

Figure 1 Methodology diagram (own figure)

Secondary data was collected through a desk-based study by conducting a literature search on the topics of climate change, vulnerability and violent conflict. The relationship between these different concepts was investigated in past academic articles, books and other publications, in order to gain a conceptual understanding of the relationship between climate change and violent conflict. The focus was on the literature published during the last ten years, which was found through search engines such as 'Google Scholar', 'Science direct' and the Lund University library database, 'LUBsearch'. Key search terms were 'climate change', 'environmental change', 'complexity' and 'violent conflict'. The literature search informed the design and content of the primary data survey questionnaire and interview guide.

For the analysis of policy documents and of frameworks which exist to settle conflicts and govern natural resource management and climate change adaptation specific to Alta Verapaz, documents were found through online searches and complemented by referrals from the interviews with members of local government institutions, NGOs and other key informants. These documents are referred to as 'grey literature'.

2.2.2 Primary data collection

Primary data was collected during a month-long field trip in Alta Verapaz in Guatemala, in February 2018.

Survey Questionnaires:

The objective of the questionnaire survey was to provide baseline information as well as establish how people in the area have viewed disaster trends and environmental changes and how they have been affected. It also includes questions to understand their livelihoods and how these have been impacted. Finally, it's aim was to establish their state of knowledge of the governance and formal institutions in place and measures taken to respond to these changes. The survey relates to people's attitudes, opinions and beliefs and is most prone to erroneous information. The framing of the questions was thus given careful thought. A semi-structured method was used, with a combination of both open and closed questions. Closed questions were formulated with the options of answering with multiple choice, rating and numerical scales. Under open questions, a blank box was provided for respondents to answer freely using their own words. A copy of the survey document and cover note can be found in appendix A.

The target group for the survey was the whole population in the department of Alta Verapaz. The aim in the sample group was to understand how the effects of climate change and adaptation

efforts were felt across various groups, which would capture insights specific to different demographic groups with varying education levels, gender, age groups, livelihood types and location. However, due to the sensitivity of some of the topics addressed, it was recommended by various local researchers to limit the sample group to accessible groups for safety reasons. A convenience sampling method was used, whereby the sampling process was neither entirely random nor entirely purposive. Rather, a convenience sample is 'one that is simply available to the researcher by virtue of its accessibility' (Bryman, 2012). Generalizability of the data is limited when using convenience samples, and this thesis does not aim to reach statistical significance, but rather to supplement the qualitative data with some insights from the general population.

In order to reach the highest number and diversity of respondents possible, three modes were used to administer the survey: self-completion via the web, supervised paper and pencil self-completion and face-to-face paper and pencil (Bryman, 2012). The questionnaire was self-completed in cases where it was shared online, using the survey platform 'Google Analysis'. It was shared with a few informants in different circles with access to the internet, who sent it on within their own circles, creating a snowball effect. Questionnaires were also printed and completed in-person in the presence of the researchers. In cases where respondents were literate and fluent in Spanish, the surveys were filled-in directly by the respondents and supervised. When respondents were illiterate and/or did not speak Spanish, an interpreter was present to translate questions and fill-in the survey in their stead. Respondents were reached by going door-to-door in various communities and via access given through universities. In total, 51 questionnaires were completed, of which 12 were done online.

For the sake of honesty and integrity, we chose to discard data from one section of the questionnaire, for which the data was corrupted due to confusion on the part of a significant portion of respondents. Despite having done a pilot survey questionnaire to avoid this sort of situation, both researchers agreed on the discrepancy found between the answers on the rating scale questions and the answers given in the open questions. Therefore, answers to questions 1, 2 and 3 from section 2 of the survey questionnaire were not taken into account in the analysis.

Semi-structured interviews:

Semi-structured interviews were conducted with members from local government institutions involved in some way with climate change adaptation, with the aim of understanding the institutional perspective towards adaptation and conflict management efforts. NGOs and other

key informants were also interviewed to gather insights from a different perspective, with NGOs representing public interests and acting as good mediators of general opinions in the region, thanks to their more intimate relationship with communities. NGOs are also part of the governance of climate change adaptation since they are involved in the implementation of adaptation programmes and can work in collaboration with government institutions. A semi-structured approach was chosen for the versatility and flexibility it offers and the reciprocity that is enabled between interviewer and interviewee (Kallio, Pietilä, Johnson, & Kangasniemi, 2016), where it is possible to follow up on questions and rephrase them according to the context. All but one of the interviews were held face-to-face, in the respondent's office or in public spaces, with the last done over Skype. All were conducted with both researchers present to maximise objectivity. This allowed one researcher to remain passive and assess the direction in which the interview was going, make sure all topics were covered and take notes on participants' reactions.

An interview guide was developed to ensure that conversations addressed the different research objectives and to allow enough structure for cross-case comparability. The guide consists of four main parts, the first of which aimed to establish the interviewee's conceptual understanding of climate vulnerability and resilience. The second part covered environmental changes and their impacts in the region. Institutions, agreements and frameworks which exist to govern natural resource management and climate change adaptation were then addressed, before ending with a part investigating conflicts in the region and ascertaining conflict sensitivity. After finalising the interview guides and questionnaire, three local researchers with experience in interviewing people in local communities with a Mayan background were consulted. Question formulation and vocabulary used were adjusted based on their feedback, received together with cultural pointers and elements to be aware of when conducting the interviews and survey. The interview guide can be found both in Spanish and English in appendix B.

A non-random judgment sampling method was used to identify potential respondents based on their roles, responsibilities and experience. In total, 11 interviewees were selected: members of local government institutions interviewed include professionals from:

- the Ministry of Agriculture, Livestock and Food (MAGA),
- the Ministry of Environment and Natural Resources (MARN),
- the National Institute for Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH),
- the National Coordination of Disaster Reduction (CONRED)

- the Ombudsman's Office for Human Rights,
- and the Secretariat of Agrarian Affairs

NGO respondents were from ADRI (Rural Integral Development Association), the Guatemalan Red Cross and Madre Selva, an ecologist organization working with community rights defence as well as environmental issues. Other key informants include a community leader and activist and an economist and ex-member of the national Superintendence of Tax Administration. After getting permission from each interviewee, all conversations were recorded and transcribed. Interview transcripts were verified by the co-researcher, to confirm transcription accuracy.

2.3 Data analysis

Qualitative data analysis was processed in two stages. First, data sources were analysed separately to extract information. Then results were found by combining and comparing the various data sources. The analysis was realised using computer assisted qualitative data analysis software program QSR*NVivo. NVivo improves qualitative analysis in terms of efficiency, multiplicity and transparency (Hoover & Koerber, 2011), thanks to its coding query system and the convenience of accessing several sources under a single code, which allows to find relationships across different data types more easily.

In the first stage, all documents for analysis, interview transcript and survey questionnaire open questions were uploaded onto NVivo. Both researchers separately coded all documents, following a specific order determined in advance, where respondents were sequenced in such a way as to avoid coding interviews which presented similar views sequentially, and to avoid ideas coming from one conversation to overly influence the coding and interpretation of the subsequent document analysed. Having two coders working on the same documents separately results in the casting '*of a wider analytic net*' and provides a '*reality check*' for each other (Saldaña, 2010). The interviews were coded in English, directly from the Spanish transcripts, to maintain the integrity of the data whilst coding in a language in which both researchers have a richer vocabulary to capture specific ideas and concepts. The resulting codes from the primary and secondary data sources and from both researchers were then merged into one working project in NVivo.

The combined codes emerging from the open coding process were organised in NVivo into trees, in which categories and sub-categories emerged. The relationship between these categories was then investigated, linking different concepts and data sources. This process resulted in the determination of convergence, complementarity or discrepancy of results as well

as silence between findings – which refers to the case in which a theme arises in one data set and not the other (Farmer, Robinson, Elliott, & Eyles, 2006).

The analysis of the sources was then used to create a web of actors, actions and circumstances, made by going through each actor identified and linking it to a growing network. The web illustrated the relationships that in various degrees contributed to the increased vulnerability and increased risk of conflict. From this vast web, the strongest connections were identified based on the original data and formulated as three separate streams, or pathways, which link climate change to an increased risk of violent conflict (Figure 12, Figure 13 and Figure 16).

Analysis of the quantitative survey was done by manually entering all of the paper survey responses onto the survey platform online, to aggregate all answers onto one platform. Google surveys offer the option of generated some percentages based on the baseline information characteristics, but it also allows for the data to be downloaded and managed in a spreadsheet. The downloaded data was worked with in Microsoft Excel and used to extract data based on demographics and investigate answers based on information about livelihoods, locations and education levels. Results from the quantitative survey were then used alongside the qualitative interview interpretations to provide an extra dimension and additional insights in the explanation of the links between climate change and violent conflict in Alta Verapaz.

2.4 Limitations and Difficulties

The link between climate change and violent conflict has been investigated in several fields, not limited to those reviewed in the literature search. Limiting the search to several key terms such as ‘environmental change’ and ‘violent conflict’ in order to set boundaries, curtail the reading and have a comprehensive overview of the literature in the area of focus may have resulted in missing insights from other related fields, such as that of political ecology or environmental economics. This leads to the missed opportunity to bridge and establish connections across disciplines, possibly leading to a richer and deeper understanding of concepts and potentially finding new explanations and filling knowledge gaps. However, bridging gaps across fields and disciplines is a research project in itself and for reasons of time, was not explored as much as it could have been in this thesis.

Although impossible to completely overcome, the impacts of misunderstandings resulting from language and cultural barriers were limited by consulting with local researchers to review the questionnaire and interview guide for elements that could be misinterpreted during interactions and conversations with respondents. Pilot surveys with community members were also

undertaken prior to the actual surveys, focusing on the way questions were formulated and understood.

Violent conflict is a delicate issue in Guatemala which could make interviewees feel uncomfortable or reluctant about being interviewed on the topic. This may have led to somewhat cautious answers which might not have adequately reflected opinions and threatened the reliability of responses. Whilst conducting the interviews there was a strong focus on establishing rapport and trust by showing empathy and engaging in small talk. The possibility of anonymity when recording responses was emphasised to eliminate the prospect of statements being traced back to the respondents.

While striving to influence the data as little as possible, it is recognised that researchers are not neutral; they have certain backgrounds, values and appearances that influence how informants answer questions. These impacts were limited as much as possible by framing and posing questions in a neutral manner and not being judgemental towards respondents but encouraging informants to speak their minds freely. Dress choice was made in accordance with cultural norms and those elements that could not be changed, such as age, gender and skin-color, were reflected upon when interpreting responses.

Chapter 3: Conceptual Background

This chapter outlines the key concepts found in the literatures related to climate change and environmental security, violent conflict and that of risk management. Literature from the last decade is used to present the latest knowledge related to climate change impacts and adaptation measures, how these have been linked to violent conflict and how this link can be understood with contributions from a societal resilience perspective.

3.1 Climate Change and Climate Change Adaptation

3.1.1 Climate change and environmental change

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as *"a change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer''* (IPCC, 2014c). In their definition, they do not distinguish between the changes caused by human activity, i.e. anthropocentric climate change, and natural climate variability. These changes, generally measured through changes in temperature and precipitation levels, are experienced by people as changes in their environment which impact their livelihoods (Vivekananda, Schilling, & Smith, 2014a). However, direct human influence can also lead to environmental change through the construction of dams or deforestation for instance. Whether the flooding of a river is caused by increased rainfall due to climate change or the activity of a dam further upstream will be experienced in the same way for the farmer whose fields are flooded, and harvest is lost.

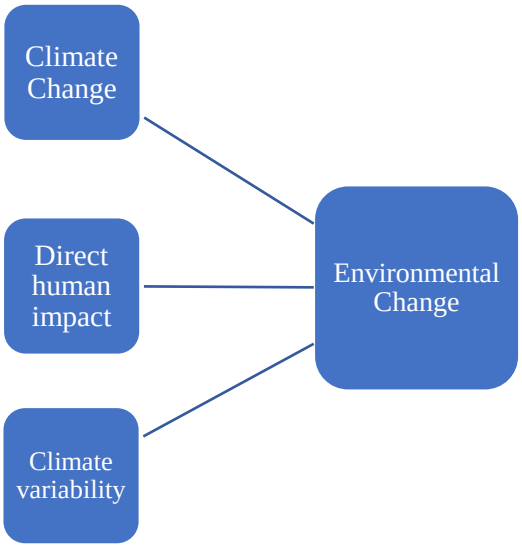

Figure 2 Components of environmental change (own figure)

Attitudes towards a changing climate are shaped by the perception people have of climate change rather than actual meteorological changes. One study found that smallholders' perception was influenced by many factors, including age, education level, livestock holding, access to climate information and extension services (Debela, Mohammed, Bridle,

Corkrey, & McNeil, 2015). This perception of changes influences the understanding of what is needed to adapt to these changes (Debela et al., 2015).

Whether the change in the environment comes from natural variability, anthropocentric climate change or as a punishment from the gods makes little difference in the resulting impact on livelihoods. However, the importance of perception is in that it can have a great impact on adequately managing climate-induced risks and adopting the right adaptation measures. Misconception about climate change and its associated risk may result in no adaptation or maladaptation thus increasing the negative impact of climate change (Debela et al., 2015).

3.1.2 Climate Change Impacts

Changes in climate have already been observed to have an impact on hydrological systems and thus the quantity and quality of water resources, on ecosystems and species extinction and has mainly had a negative impact on crop yields (IPCC, 2014c). Long-term trends such as rising-sea levels and desertification, together with the increase in disasters such as droughts, flooding and hurricanes, will affect the availability of natural resources (Salehyan, 2008). However, of the predicted changes and impacts, the level of confidence is not so high, especially at a local level where the specific interplay between different risks cannot be easily forecast. To understand environmental changes at a local level, drawing from indigenous groups knowledge can provide useful information as they are said to be '*keen observers of climate change but are also actively trying to adapt to the changing conditions*' (Ishaya & Abaje, 2008). Indigenous people may be more sensitive to environmental changes as the impacts are felt differently by groups, depending on their livelihoods, the social system in place to support them and their specific vulnerability complex.

Livelihoods

The more a person's livelihood is dependent on renewable resources, the higher the risk of climate change having a negative impact on their livelihood, as the access to, and quality of, natural resources is reduced by climate change (Barnett & Adger, 2007). The changes in temperature and precipitation have an impact on the conditions for agriculture (Zografos, Goulden, & Kallis, 2014). Therefore, these impacts will be most felt by subsistence or smallholder farmers in developing countries, whose vulnerability comes from a combination of location-specific impacts and limited capacity to adapt due to socio-economic, demographic and policy trends (Morton, 2007a).

Food security

According to a report from the Environmental Aid and Security Program, food security is generally viewed as consisting of four components; (1) Availability, concerning the supply of food through either production or through the market. (2) Access, which is concerned with whether the available food supply can be purchased. (3) Utilization; whether the available and accessible food meet the physiological needs. (4) Stability, that deals with all of the three above mentioned criteria being fulfilled despite changes in seasons or pricing for example (Simmons, 2013).

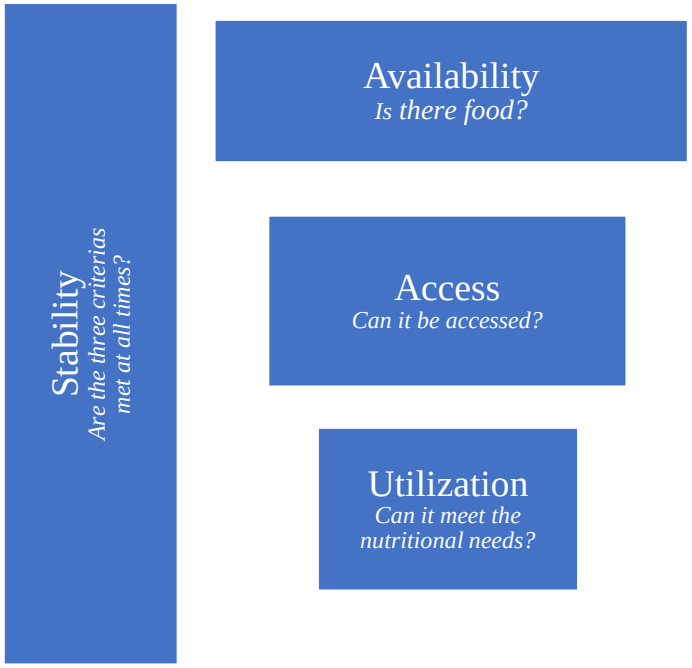

Figure 3 Environmental Aid and Security Program's four components of food security (own figure)

This division into four aspects of food security serves to create a more nuanced analysis that can pinpoint the reason for food insecurity better than a general term. The IPCC (2014) report found that the observed impacts of climate change related primarily to the production aspect of food security rather than access. This decrease in production is linked to land degradation, access to water, and changed weather patterns (Feola, Vanegas & Bamon, 2015).

The impact of the environmental changes on the natural system have far reaching consequences on the human systems, ranging from exacerbating health problems, damaging economies and population displacements (Salehyan, 2008, IPCC 2014). To reduce these impacts and manage risks related to climate change, coping capacities and adaptation mechanisms need to be understood.

One cannot view the social world in isolation from the ecological one and vice versa. These are interconnected and affecting each other in various non-linear ways. This entails that the changes do not flow freely between the two systems, that small changes in one system can have a large impact in the other and that there can be a time difference between them. Since some people

are more dependent on parts of the ecological system than others, changes will affect people unequally. This must be taken into account when designing policies and programmes (Berrouet, Machado, & Villegas-Palacio, 2018).

3.1.3 Adaptive capacity

Climate change adaptation measures consist of efforts made to better respond to the experienced or anticipated changes in the environment, done with the intention to lower the risk of a given hazard. These efforts can be made at various levels, from governmental to individual, but the ability to adapt is much dependent on what is called adaptive capacity. Adaptive capacity is a part of the concept of vulnerability (Cardona et al., 2012) and can be described as the "*ability of a system to adjust to change and recuperate from its effects*" (Feitelson & Tubi, 2017). It is determined by the means available (Feitelson & Tubi, 2017) in terms of finance, technology, social context and education. These means are dependent on the societal and economic structure, which in turn make underlying structures "*critical determinants*" of adaptive capacity (Feitelson & Tubi, 2017). Essentially, a fragile context will provide preconditions for a lower level of adaptive capacity, and thereby a higher level of vulnerability.

The concept of adaptive capacity is sometimes merged with the concept of coping capacity. The two differ in that adaptive capacity refers to anticipation of a given event and preparing to lessen the impact; and coping capacity to manage a hazard that is being or has occurred (Cardona et al., 2012). However, in various studies, the term 'adaptive capacity' covers both aspects.

Institutional adaptation

Adaptation from an institutional perspective can happen through National Adaptation Plans for Action (NAPA) or various versions of climate policies and climate change programmes. Examples of projects derived from these plans could be installation of early warning systems (EWS) or reforestation (IPCC, 2014a, p. 1155). However, these efforts are not likely to work if the socio-political and economic context are not considered and the programme is not conflict sensitive (Smith & Vivekananda, 2007). This requires communication across institutional boundaries. A danger is that lack of coordination between institutions and poor understanding of the context result in adaptation to one stressor and maladaptation to another (Feola, Agudelo Vanegas, & Contesse Bamón, 2015). One of the challenges is that the studies that may be the foundation of such plans and programmes are based on studies of stressors in isolation, simplifying the relationships and not taking into account underlying factors (Feola et al., 2015).

Individual level adaptation

On an individual level, adaptation measures without the support of institutions may be responses to resource scarcity or worsening conditions for agriculture caused by climate change. For example, farmers have been observed to increase the use of pesticides as an adaptation strategy to the increase in pests, derived from rising temperatures (Chandra, McNamara, Dargusch, Caspe, & Dalabajan, 2017), and the change to off-farm sources of income in certain seasons and changes in livestock species (Morton, 2007b). As climate change often results in resource scarcity and reduction in arable land, adaptation might manifest itself in competition over resources or migration (Helland & Sørbø, 2013) which might have negative consequences in the areas of resettlement.

All of the above-mentioned strategies are dependent on some level of adaptive capacity, whether the access to non-climate sensitive sources of income, financial means to buy pesticides or a network that allows for migration. Financial capacity in particular is key to being able to adapt without institutional aid, since this hampers access to education, ability to adopt new technologies, travel options and makes a change in income source less risky (Hogarth & Wójcik, 2016).

Enabling environment

The enabling environment refers to the broader context of elements such as power relations, values, laws and social norms. This provides the frame in which adaptation measures happen, whether that is international development aid or local adaptation for example (Andie & Lemma, 2006; Becker, 2014a). The nature of the factors within this level are vast and not easily changed, but change at this level is often what is needed to create sustainable solutions (Becker, 2014a).

A higher level of adaptive capacity is a component of a relatively lower level of vulnerability (Feitelson & Tubi, 2017), which in turn is associated with a lower likelihood of conflict through human insecurity (Vivekananda et al., 2014a). In other words, when adaptive capacities are poor, due to poor societal structures and weak institutions for instance, the likelihood of conflict increases (Feitelson & Tubi, 2017).

3.2 Violent Conflict and Conflict Resolution

3.2.1 Conflict definition

Conflicts are not per se negative and can lead to positive outcomes when they are well managed. According to Mitchell (1981), a state of conflict is '*any situation in which two or more 'parties'*

(however defined or structured) perceive that they possess mutually incompatible goals' (1981, p. 17). Social change can be brought about to avoid resorting to force. However, the concern in this thesis are situations in which the conflicts which arise are handled with the use of violence (i.e. the more destructive types of conflicts, such as civil war, armed conflicts or riots).

Conflict is said to be fuelled by a combination of psychological and behavioural factors, together with structural conditions for alienation (Jeong, 2008). It is therefore important to investigate the motivations and perceptions behind the causes of a specific conflict as well as the social system in which it takes place. It is not enough to interpret the use of violence based on a set of basic and subjective assumptions (Demmers, 2016), which the securitisation of climate change literature is rather prone to doing. Rather, the analysis of violent conflict must take into account the complexity of this social phenomenon and make use of the analytical frameworks and methodologies which can be found in the field of conflict studies. This would avoid the situation in which people formulate an interpretation of conflict which promotes their interests, a critique which has been made by some studies about the links between climate change and conflict (see Kevane & Gray, (2008) and Hartmann (2010)).

3.2.2 Violence in Conflicts

The form that conflict can take when a party acts upon its perception of goal incompatibility ranges from strikes and demonstrations to self-destructive actions but can also take a subtler form termed by Scott (1990) as 'everyday resistance', which manifests itself as sabotage, non-cooperation or defiance. However, to understand how conflict takes the form of violence, a conceptualization of the term 'violence' is needed. Researchers on the topic tend to use the term either as a product, in which the occurrence of violence is sporadic and concrete and an exception to the norm, or it is understood as being dynamic and processual (Demmers, 2016). It can also be understood in terms of referring to a physical act of force, or more comprehensively as defined by Scheper-Hughes and Bourgois (2004): '*violence also includes assaults on the personhood, dignity, sense of worth or value of the victim. The social and cultural dimensions of violence are what gives violence its power and meaning*' (as cited in Demmers, 2016).

As wars and violent conflict have evolved from being predominantly inter-state to intra-state over the 1990s, so too have the dynamics. Intra-state violence involves different actors, motives and contexts than those studied in the field of conflict prior to the 1990s. Themes which dominate the analysis of smaller intra-state conflicts include issues regarding identity

formation, ethnicity, resource allocation and collective grievances and action (Demmers, 2016). The link between the climate change security literature and the civil or violent conflict literature may not have been sufficiently explored, as many of the themes and frameworks from the conflict literature do not emerge in that of the climate change security one.

3.2.3 Drivers of violent conflict

The risk of violence is generated by a set of mutually interlocking factors, including poverty, poor governance and the legacy of past conflicts (Smith & Vivekananda, 2007).

Legacy of past wars and conflicts

A determining factor in vulnerability to the risk of violence is the legacy of past conflicts which, other than the fact that they result in economic and environmental losses, also demonstrate a history of divisions between groups in a country, grievances of which may remain unresolved. These grievances may relate to perceived or real injustices committed against certain groups, relating to access to resources and services, political inclusion and inequality (The Fund for Peace, 2017). The course of history also has a play in determining privileges, which in turn impacts vulnerability.

Poverty

There has been a body of research investigating how poverty may be an underlying cause of conflict through grievance (from poverty and social exclusions) and greed (opportunities for predatory accumulation) dynamics, although neither of these theories is backed by sufficient empirical evidence (Goodhand, 2003). Another research piece suggests that poverty caused by loss of livelihood (related to environmental scarcity) increases the likelihood of young men joining an armed group (Ohlsson, 2000).

Weak governance

In states where the government fails to cover its population's basic needs, the social contract with its citizens is weakened and its perceived legitimacy decreases, increasing the risk of political instability (Smith & Vivekananda, 2007). The capacity of the state may be weakened through resource scarcity, as revenues fall thereby reducing the rent pie and causing deficiencies in the delivery of public goods, such as infrastructure and security (Theisen, 2017). However, aspects such as corruption, arbitrary authority and poor systems of justice are also essential in determining state legitimacy and feelings of citizenship. These are all barriers to institutions at different levels having the capacity to manage resource shortages and conflicts efficiently, and

thus preventing violent conflict. Moreover in their paper, von Uexkull, Croicu, Fjelde, & Buhaug (2016) state that where meaningful political participation at the state level is not present, unrepresented groups are more likely to deal with resource-related grievances with the use of violence.

Fragility

All of these factors have an impact on the fragility of a state. As with many concept definitions, there remain disagreements on what characterises fragility and for political reasons, there is no global consensus on a list of states or regions considered fragile (DFID, 2005). However, several states, institutions and organisations have definitions of the concept, some based on institutional capacity, such as the working definition of the Department for International Development (DFID), where a fragile state is defined as one where '*the government cannot or will not deliver core functions to the majority of its people, including the poor.*' (DFID, 2005, p. 7). Other definitions are based on indicators, such as the one from the Fragile State Index (FSI), which mentions other dimensions, poverty, demographic pressures, group grievance, lack of legitimacy of the state and public services (Werrell et al., 2018). However, violent conflict has been argued to be both a cause and a consequence of fragility (European University Institute, 2009; Mcloughlin & Idris, 2016; Putzel & John, 2012).

In their article, Vivekananda, Schilling, & Smith, (2014) extend their definition of fragility to cover informal institutions as well as government ones. This thesis will also apply the concept of fragility to both formal or informal institutions, as societies can be structured to rely on community institutions with local leaders, especially in the absence of legitimacy of formal institutions.

3.2.4 Mechanisms linking climate change and conflict

Since it has already been established that quantitative studies attempting to demonstrate a direct causal link between climate change and violent conflict have yielded inconclusive results and have been criticised regarding their use of poor quality data, flawed methodology and insufficient integration of the complexity of the processes involved, the mechanisms presented here do not include those suggested in that line of research.

However, of the studies that have attempted to identify indirect, more complex mechanisms through which climate change has been linked to violence, several mediating factors have been identified, with an emphasis on the role of institutions and on adaptive capacity. Most papers

on the topic discuss the links but few actually present theoretical or empirical studies which investigate the pathways in a specific context. In the case where case studies have been made, the majority emphasise the role of non-climatic variables as leading to insecurity, predominantly economic, historic and political factors (Heinrigs, 2010).

In the G7 commissioned report A New Climate for Peace, seven compound climate risks are found which can impact security (Rüttinger, Smith, Stang, Tänzler, & Vivekananda, 2015). These are:

i. Local resource competition: A result of climate change is likely to be a decrease of available resources. This, in combination with growth in population is likely to cause competition of the resources available (Rüttinger et al., 2015).
ii. Livelihood insecurity and migration: Climatic changes can cause insecurity for people depending directly on natural resources. This is likely to alter the existing migration patterns and increase unemployment, making informal work and illegal sources of income more attractive (Rüttinger et al., 2015).
iii. Volatile food prices and provision: Hendrix & Brinkman (2013) find that food security can be a factor in popular mobilization as well as a risk multiplier. Inversely, conflict itself leads to food insecurity, creating a circular link between the two (Rüttinger et al., 2015).
iv. Extreme weather and disaster: Extreme weather is decreasing resources, putting pressure on every of society's systems and decreasing opportunities, making the context more fragile, which can lead to conflict (Rüttinger et al., 2015).
v. Transboundary water management: Water supplies shared between states can serve as a cause for tension and political power struggles. The risk of sparking a conflict is increased by the resource is becoming more scarce due to climate change (Rüttinger et al., 2015).
vi. Sea-level rise and coastal degradation: When sea level rise and landscapes changes, conflicts might arise from people being forced to migrate. Changing borders and coastlines and ocean resources might also lead to disputes (Rüttinger et al., 2015).
vii. Unintended impacts of climate policies: Unintended impacts of policies can have effects on the likelihood of a conflict arising. This is especially true in cases where the context is already fragile and where government institutions lack funding and coordination. A likely result is marginalisation of minorities and loss of biodiversity (Rüttinger et al., 2015).

Salehyan (2008) points out that people are unlikely to engage in armed conflict as a response to environmental change due to the high costs that it entails and the inefficiency it represents in terms of resulting in a better distribution of resources and political power. On the contrary, violence is a risky option which requires large scale collective action, and can have devastating impacts on the environment and economy, making it a suboptimal option compared to engaging in simpler, small-scale coping strategies (Salehyan, 2008b).

It is therefore the amalgamation of a multitude of factors which could lead to the outbreak of violence. The risks outlined in a New Climate for Peace (2015) are all interrelated and have knock-on consequences on each other. Although all of the mechanisms outlined above relate to the negative cycle of climate change leading to violence, one study does investigate the pathways leading to conflict prevention and peace (Vivekananda et al., 2014a). The role of political institutions in successfully managing the risk of conflict is essential, as is the level of conflict sensitivity which is exhibited in institutions' and organisations' interventions, programmes and policies.

3.3 Vulnerability and resilience

At the interface between environmental change and possible conflict is the concept of vulnerability. Vulnerability consists of relationships and configurations between various factors that determine whether a situation may tip into violent conflict.

Climate vulnerability can for a closer analysis be divided into exposure, sensitivity and adaptation, as is done by Vivekananda, Schilling and Smith (2014a) and KC, Shepherd and Gaither (2015) for example. Here, 'exposure' should be understood as the rate and magnitude of the change or stressor (where a stressor is any type of event that puts pressure on a system). 'Sensitivity' refers to the availability of resources prior to the impact, where limited access to a resource will make people more sensitive to a change that has a negative impact on that resource. 'Adaptation' is defined as the capacity to adapt to the ongoing or expected changes. Taking a closer look at sensitivity, it sometimes becomes hard to define when the external impact began (especially in slow onset disasters or gradual changes, such as changes in the climate). This makes it problematic to examine the available resources prior to the impact, because the beginning of the impact is ambiguous.

Based on this understanding of vulnerability, climatic changes have impacts on the level of vulnerability through exposure, which can lead to devastating outcomes for people and their security based on their livelihood, level of poverty, etc. Exposure to climatic change in turn

creates a higher sensibility to new impacts, if existing vulnerabilities are not adequately dealt with.

To illustrate this, KC, et al. (2015) provide an example in which even though climate change manifested as temperature increases can lead to drought and in turn cause crop failure, it is the institutional preparedness within the term social vulnerability that is a crucial factor determining *'whether an agricultural drought transforms into a 'socio-economic drought''* (KC et al., 2015). Therefore, climate change should be understood in relation to the evolving vulnerability of the system it is interacting with (IPCC, 2014c). An understanding of the ways in which the system is vulnerable to climate change is needed to adequately deal with the risks it presents – including the risk of increasing fragility and violent conflict.

In some studies (see for example KC, Shepherd & Gaither (2015) and Graziano & Rizzi (2016)) vulnerability is quantified based on indicators, to compare levels. This way of approaching vulnerability fails to account for compound risks as well as not explaining relationships (Feola et al., 2015). Investigating the stressors individually without taking the wider context into consideration can lead to adaptation measures "*that may result in maladaptation to other stressors*" (Feola et al., 2015). The aim of this thesis is not to quantify levels to compare, but rather unpack the relations in a specific context.

How the concept of vulnerability relates to the one of resilience differs throughout the literature. One way of looking at resilience is as the counterpart of vulnerability (Vivekananda, Schilling & Smith, 2014a), while another way categorises vulnerability as "*concerning to the structural features of [the] system*" and resilience as the capacity of a system to withstand a negative impact (Graziano & Rizzi, 2016). Resilience has also been described as being an emergent property of anticipation, recognition, adaptation and ability to learn from previous events (Becker, 2014b). This definition includes an aspect of agency into the concept. The result is a system that not only responds to stressors but is also able to anticipate and prepare for risks with the objective of developing along a preferred trajectory.

Chapter 4: Case Study Presentation of Alta Verapaz

Figure 4 World map, location of Guatemala (own figure)

Guatemala is a 108.889 km^2 country in Central-America, bordering Mexico to the west and Belize, Honduras and El Salvador to the east (CIA, 2018). The country is of mixed ethnicity, primarily divided between twenty-two different indigenous ethnic groups, Ladinos (descended from the Spanish) and Mestizos (Amerindian-spanish) (CIA, 2018).

Figure 5 Map of Guatemala, location of Alta Verapaz (own figure)

Alta Verapaz is a department in the central highlands of Guatemala, further divided into 16 municipalities, the capital city of which is Cobán. It is a mountainous zone, containing precious natural resources, mostly forests and high value wood (FEWS NET, 2016). The area is characterised by its micro-climates, but generally follows a seasonal pattern with a dry season from January to April, a wet season from May to December and two months of high temperatures (July and August) (FEWS NET, 2016).

4.1 Social and cultural characteristics

The population of Alta Verapaz was estimated to number 1,183,000 in 2013, almost 90 percent of whom are indigenous (Instituto Nacional de Estadística, 2014) and of Mayan culture. The topography, isolation and social exclusion of Alta Verapaz are factors which resulted in the preservation of the Mayan culture in the area, in terms of language, beliefs, traditions and customs (Mariscal, 2014). The main indigenous groups are the Poqomchí and the Q´eqchi´, who maintain their respective cultural identities through the preservation of their languages (Mariscal, 2014).

An important cultural aspect of these indigenous groups is their cosmovision, many elements of which are shared across both ethnicities (Mariscal, 2014). At the root of their cultural identity is maize, which is traditionally considered to be the element from which the gods created humans. Nature and its respect is also deeply engrained in their culture and social and personal self-comprehension, evident in their strong relationship to the land (Mariscal, 2014).

This attachment to the land and their belief in their inalienable rights to it has persisted through the Spanish conquest of Guatemala during the 16th century (although the department of Alta Verapaz was never conquered owing to the strong Maya resistance, but only later pacified with religious missions), the establishment of European laws and institutions, the liberal land and labour reforms from the 19th century, and later the changes associated with the country's coffee economy (Kit, 1998).

4.2 Local economy and livelihoods

There is a strong interactive relationship between the people and their environment as most households in the area are involved in agriculture. In central and southern areas of the department, the local economy is based on the production of food crops, mainly maize and beans, and cash crops such as coffee and cardamom. For households who own forested areas or areas suitable for reforestation, government forest initiatives have led to an uptake in forestry activities as an important additional source of income (FEWS NET, 2016). In northern Alta Verapaz, food crop production is also an important source of income, but levels are slowly reducing as the agro-industrial sector continues to grow. Forests, pasture and food crop lands are being replaced by large scale monocultures, especially Palma Áfricana (African oil palm, used to make palm oil). In both livelihood zones, poor households rely on their own crops as a source of food, supplemented by market purchases and wild food, and on the provision of agricultural labour as a source of income (FEWS NET, 2016).

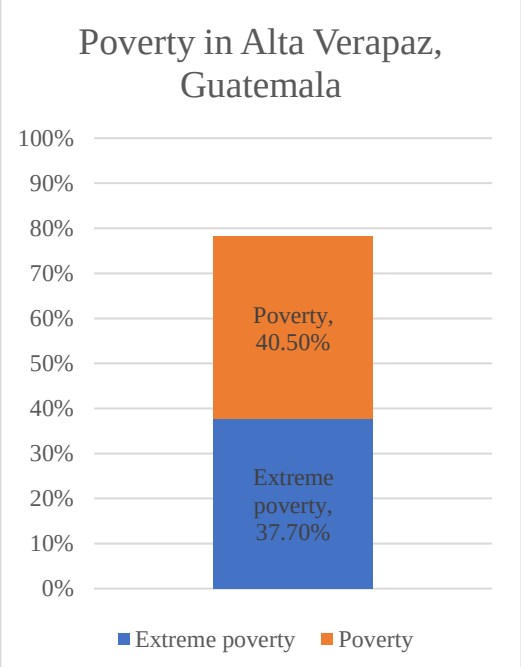

Figure 6 Percentage of poor and extremely poor people in Alta Verapaz

Poor households represent a majority of the population in the department. According to the national institute of statistics in Guatemala, 37.7

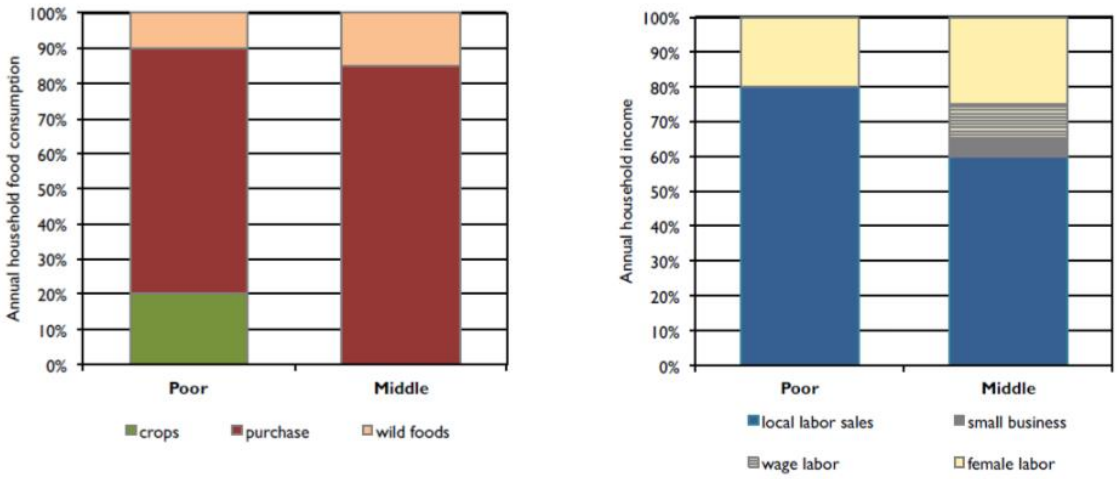

Figure 7 Food sources by wealth group and cash income sources by wealth group in Alta Verapaz (source: FEWS NET)

percent of the population of Alta Verapaz lived in extreme poverty in 2011, down from 43.5 percent in 2006. The percentage of people living in poverty only dropped 0.6 percentage points, from 78.8 percent to 78.2 percent over the same time period (Instituto Nacional de Estadística, 2014).

Though it has decreased over the last couple of years, the level of illiteracy in the department was still 28.4 percent in 2013. (Instituto Nacional de Estadística, 2014).

4.3 Fragility and the legacy of the past

These high poverty levels in Alta Verapaz, and in Guatemala more generally, are related to the low levels of social inclusion. The World Bank's Country Diagnostic of Guatemala refers to two Guatemalas divided geographically, ethnically and in terms of human capital (Sanchez et al., 2015). These characteristics result in a large gap in access to basic services and infrastructure and is evident in malnutrition, health and education indicators (Sanchez et al., 2015).

The division can at least partly be traced back to the history of the country. Guatemala has a long history of armed conflict and extreme violence with the most notable incidents being the relatively recent massacres and kidnappings which took place during the civil war from 1936 to 1996 (Morales, 2017), especially in the highlands where large parts of the indigenous population live. The violent incidents had "*strong ethnic overtones*" (Wayland & Kuniholm, 2016, p. 396) and have caused distrust and fragmentation of national identity. Though a peace

agreement was signed, grievances remain, and disappearances have not been accounted for. Furthermore, cadastre and titling have changed the ownership of areas in Alta Verapaz, originally inhabited by indigenous families (Democracy International, 2015).

After the civil war, reforms facilitated the entry of international companies in the country (Wayland & Kuniholm, 2016), chiefly engaging in mining, large-scale agriculture and hydroelectric power plants. Despite public opposition to such projects, the government continuously grants foreign companies access and permissions (Aguilar-Støen & Hirsch, 2015). This has been a source of social conflicts as the companies are operating in locations where indigenous people live. The political decision making processes largely function without the voice of indigenous people, who are heavily underrepresented in the political arena (Wayland & Kuniholm, 2016). According to Global Americans (2017), while 40-60 percent of the population is indigenous, this demographic group only has 13 percent of parliament seats.

This fragmented social contract has in turn led to weak public institutions, unable to adequately meet basic needs and generated unequal opportunities for individuals and firms (Sanchez et al., 2015). Faith in the state is low, indicated by a 136th place on the corruption perceptions index (out of 176) in 2016 (Transparancy International, 2016).

4.4 Climate change risk and policy context

According to the Global Climate Risk Index, Guatemala was the 11th most climate risk affected country in the world between 1997 and 2016 (Eckstein et al., 2017). It is subject to droughts, storms, hurricanes and flooding that are already impacting the agricultural sector, threatening natural resources and human health. Temperature changes and changing rainfall patterns are affecting key subsistence crops' growing cycles (Sanchez et al., 2015). Climate-change effects disproportionately impact poor households and their food and water security due to their dependence on natural resources for livelihoods, the lack of social safety nets and their less developed coping mechanisms. These climate trends are projected to continue in the future. Monthly average temperatures in the country are predicted to increase between 2.5°C and 4°C by 2050. The frequency and intensity of extreme rainfall events, droughts and floods are also projected to increase (USAID, 2017).

In 1995, Guatemala ratified the United Nations Framework Convention on Climate Change (UNFCCC) and has since taken policy actions in line with the Convention commitments. In 2001, a Climate Change Unit was established within MARN, followed by Climate Change National Policy in 2009, which sets out guidelines for adaptation and mitigation at a national

level. The Climate Change Framework Law was passed in Congress in 2013, in which the National Climate Change Council (CNCC), a collegial advisory body presided over by the President of the Republic, and the National Climate Change Fund (FONCC) were established.

4.5 Alta Verapaz – Interaction of climate and conflict risks

Alta Verapaz encompasses many factors which were identified as increasing the potential for violent conflict presented in chapter 3. One such aspect is poverty, serving as a potential multiplier of conflict potential. Another is the lack of representation and voice that indigenous people especially are experiencing. This is made worse by the lack of trust in government institutions and unresolved grievances from the time of the civil war and the lack of efforts (or even at time counter-effective measures) from the government side to improve living conditions.

Together with poverty and state fragility, a large number of people in the department suffer increased food insecurity from climatic impacts on agriculture and natural resources. This has been noted by the G7 commission as one of seven compound climate risks impacting security. Another of the climate risks identified is food insecurity that serves as a risk multiplier and driver of conflicts.

Comparing conditions in Alta Verapaz with factors that have been shown to increase the conflict potential, there are many and clear connections, both politically, socially and in terms of climate, that set the preconditions for violent conflict to occur. Alta Verapaz has been chosen as the focus of this case study based on factors assumed relevant from previous studies. The particularities of the context may provide new insights into how different factors interplay to increase the risk of violent conflict.

Chapter 5: Results and Discussion

The following section presents and discusses the results from the analysis of the interviews, survey questionnaires and grey literature. Looking at patterns in the concepts and categories found, a web of inter-connections and relationships emerged. Three main pathways were found through which climate change could indirectly result in conflict in Alta Verapaz and these are presented as streams. Note that not every stream leads to the risk of violent conflict, but rather to an increase in the preconditions for a conflict to spark from greater vulnerability to certain risks.

Firstly, climate change in Alta Verapaz is presented and linked to vulnerability. Next, the stream relating to adaptation strategies and programmes is described and discussed. The third section presents the stream centred around Large-Scale Land Acquisition (LSLA) and Corporate Social Responsibility (CSR). These streams are then related to each other and to the wider socio-economic context in which they are shaped. Finally, learnings from the case findings are linked to the wider discussion around climate change and violent conflict. Unreferenced quotes in this section are gathered from the primary data sources and it is specified whether they come from the interviews or the questionnaire. All quotes have been translated into English by the researchers from their original Spanish versions.

5.1 Climate Change in Alta Verapaz

5.1.1 Perceived and actual changes

When asked about their perception of weather changes attributed to climate change, all 11 interviews noted changes in rainfall patterns. Half of the respondents referred to the disappearance of the phenomenon of *Chipi Chipi.* As one noted:

> *"What was normal here, basically Cobán was a city in which there was a permanent drizzle called "Chipi Chipi" during 7 or 8 months. It is a very light rain."*

This quasi constant drizzle was replaced by short, heavy outbursts of rain, with periods of rain shortages in between. One respondent explained that *"the amount of rain that could fall over 3 months now falls in 2 or 3 weeks".* There was a perceived increase in the intensity and frequency of rainfall. Another change mentioned by all but one respondent who addressed the topic was the *increase in temperature* and the unusual *cold fronts*. During the summer season, the temperatures reach higher extremes and during the winter, temperatures reach lower extremes

than in the past. However, the average temperature is generally perceived to have increased. Several respondents characterised these changes as a new weather pattern or an increase in the climate variability and unpredictability in the weather patterns.

Unfortunately, most of the quantitative data regarding perceived weather changes was corrupted due to confusion on the part of a significant portion of respondents. This data was not taken into account in the analysis. This decision was explained and justified in the Methodology chapter. In response to the question "In your opinion, how has the temperature changed over the past 15 years?", 93 percent of respondents in the quantitative dataset agreed that average temperature has increased, and 88 percent perceived an increase in the temperature extremes over the last 15 years. This is illustrated in Figure 8 Quantitative dataset – perceived average and extreme temperature changes.

Figure 8 Quantitative dataset – perceived average and extreme temperature changes

However, in the open questions, most of the same climate changes were observed as those made in the qualitative dataset. The following changes were most commonly noted: *increasing temperatures, cold fronts, disappearance of Chipi Chipi, heavy rains* and *increased rainfall.*

Recorded meteorological data was shared with us by the INSIVUMEH office in Cobán. Regarding increase in rainfall, on average annual rainfall levels rose by around 10.4 mm per year between 1971 and 2014, as can be seen in Figure 9 Annual rainfall recorded in the Cobán station. Retrieved from INSIVUMEH (2018)

. The range of values was wider between 2001 and 2014 than between 1971 and 2000, suggesting a larger variability and unpredictability in rainfall over the last few years. This is illustrated in Figure 10 Annual rainfall patterns in the Cobán station, for the periods 1971 to 2000 and 2001 to 2014. Retrieved from INSIVUMEH (2018) (INSIVUMEH, 2018).

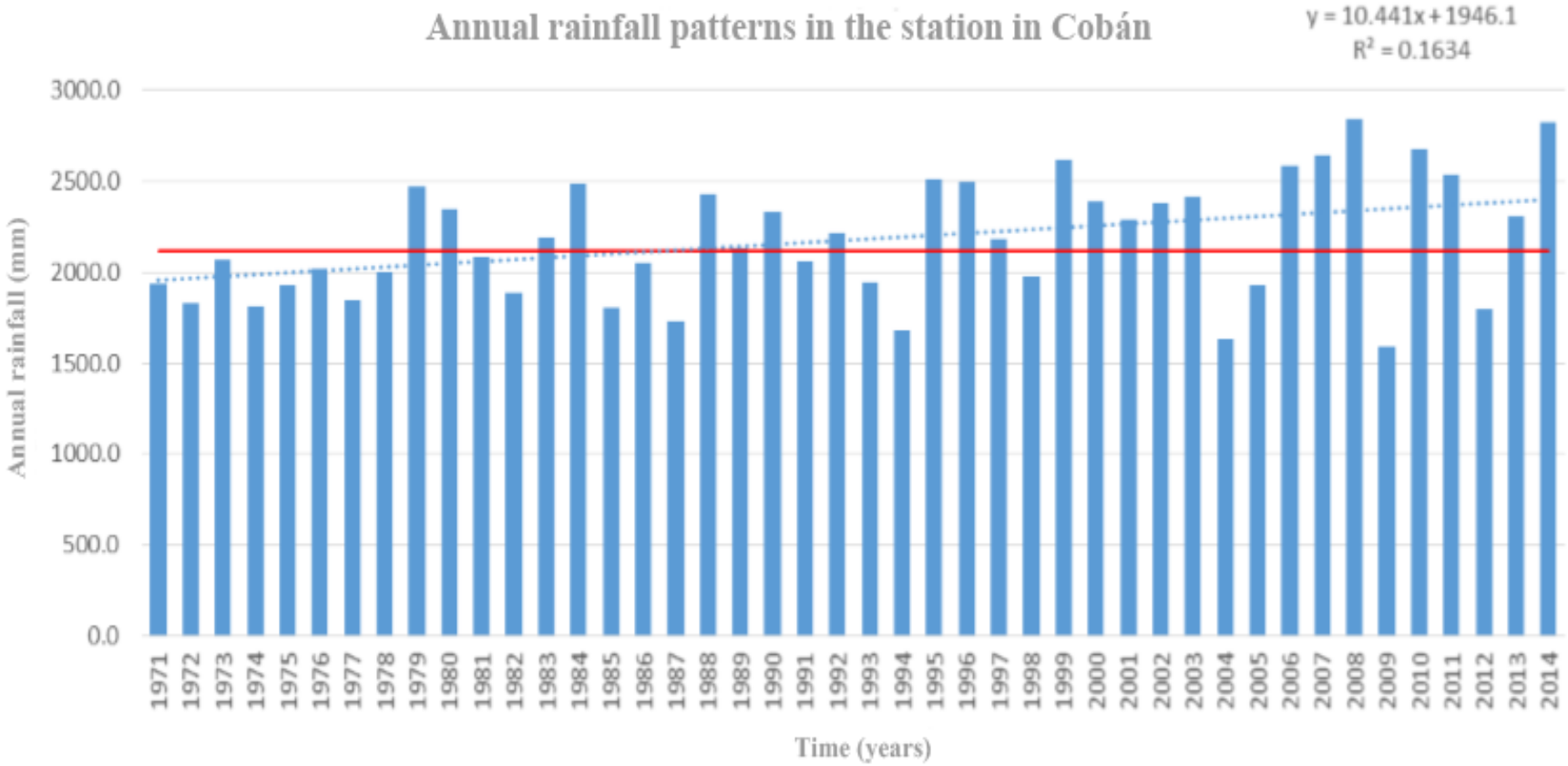

Figure 9 Annual rainfall recorded in the Cobán station. Retrieved from INSIVUMEH (2018)

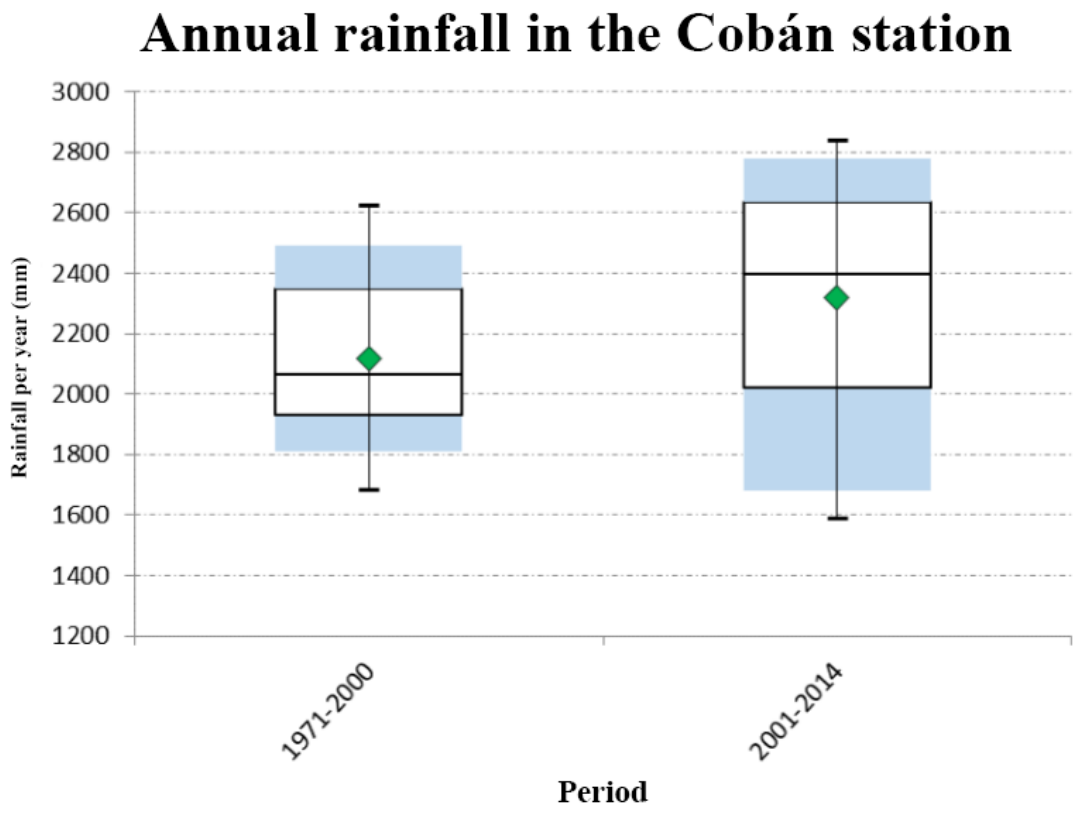

Figure 10 Annual rainfall patterns in the Cobán station, for the periods 1971 to 2000 and 2001 to 2014. Retrieved from INSIVUMEH (2018)

Concerning rainfall intensity, the INSIVUMEH respondent stated the following:

> *"Referring to the years 1996 to 2000, rainfall was more stable, it rained nearly every day and 400mm of rain fell during the year. Today, the 400mm can fall in eight days. Very intense."*

The data on rainfall patterns confirms that on average, rainfall had increased, has become more intense and characterised by greater unpredictability and variability.

As for temperature changes, the numbers show that between 1971 and 2014, temperatures had increased by an average of 0.07 degrees celcius per year. This translates into an aproximate 3 degree increase in the 43 years of measurement. These results are in line with climate change scenario predictions made by the IPCC for the Central American region.

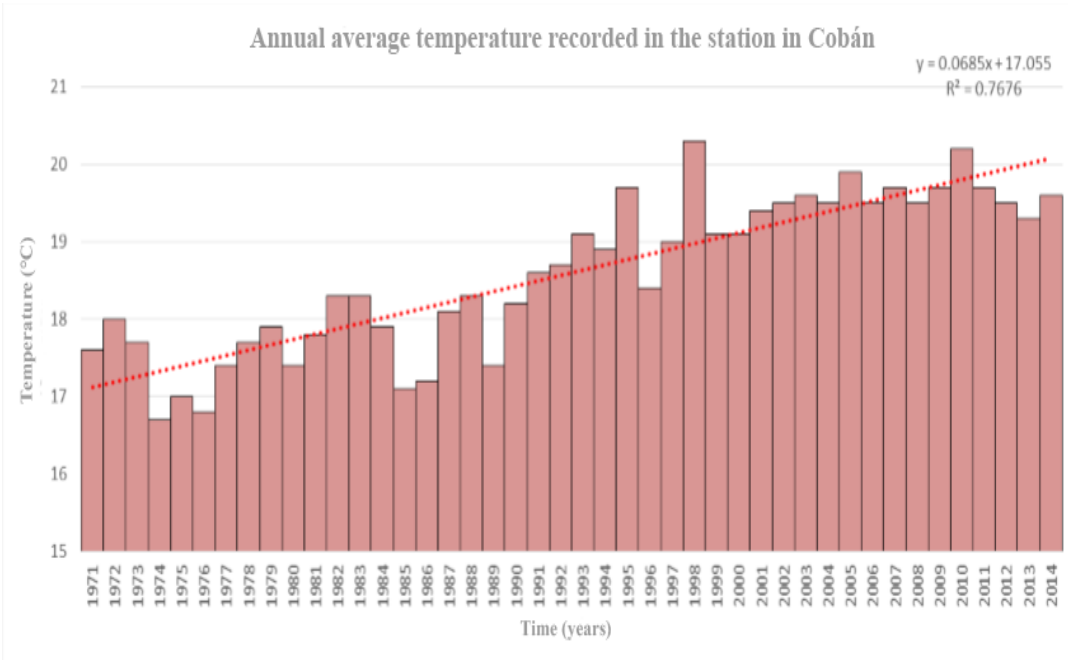

Figure 11 Annual temperatures recorded in the Cobán station. Retrieved from INSIVUMEH (2018)

These climatic changes were attributed by respondents to the activity of *industrialised countries*, to *GHG emissions* on a global scale, to *population growth*, both local and global, putting more pressure on resources, and leading to *deforestation* (see Figure 12). In their responses, interview and survey respondents usually mixed the causes of climate change and the causes of environmental changes, often using the terms interchangeably. This can be explained by a limited understanding of the concept of climate change. One interviewee who comes from a small rural community affected by the weather changes informed that many people there do not have an understanding of climate change as a concept and do not connect the causes to the impacts, but rather experience abnormally changing seasons and that *"the weather is crazy"* (key informant 1). As such, changes were also linked to the *use of agrochemicals*, the *presence of companies* involved in mining and hydroelectricity "*who change the river courses and have a negative environmental impact*", as stated by a survey respondent, and to *pollution*, which was used to refer to industrial waste as well as household waste.

5.1.2 Climate Change Impacts

The increase in rainfall leads to high levels of soil saturation and to an increase in the instances of landslides and floods, illustrated in Figure 12. The 2017 rainy season (April till November) resulted in 21 deaths and negatively affected 213,000 people through the damage to homes and infrastructure (RSOE, 2017). One interviewee explained that Alta Verapaz is characterised by many karstic areas, with subterranean streams and caverns. In periods of heavy rainfall, these

sensitive soils are weakened and form holes. Building regulation "*is only on paper but is still not being carried out*" (government institution 3) so there is little to discourage people to build in risk-prone areas, or at least to build more risk-proof housing. This results in houses built on areas where groundwater passes sinking in periods of heavy rain. The poor infrastructure maintenance, especially that of bridges, was also stated by an interviewee as one of the causes of infrastructure sustaining damage so easily.

The other area heavily affected by intense rainfall and floods is agriculture, with crops suffering from the water excess. Crop failure has been generating higher levels of food insecurity, loss of income and often a rise in food prices, illustrated in Figure 12. Livestock which would normally have been consumed by the household is sold and the crops usually sold on the market are all consumed in the household. The cash crops in the region, coffee and cardamom, are also severely affected by climate change and their loss affects the economy in the whole region. The changing climate and less predictable cycles make it harder for farmers to know when to sow, harvest and predict yields (NISGUA, 2017). Several respondents also mentioned that flooding and temperature increases have resulted in an increase in pest infestation, further affecting crops and livestock.

Flooding was the problem most often mentioned in the survey open questions and was reported to leading to decreased mobility due to roads and bridges becoming unusable. This restriction of movement has impacts on people's ability to get to work or to school but also cuts them off from aid. Crop failure and livestock damages were also often linked to floods and drought in the survey responses. These links have been gathered in Figure 12 to show the connections to vulnerability.

Finally, it was reported by both interviewees and survey respondents that the higher mean temperatures also allow mosquitos to thrive, which has in turn increased the incidence of malaria, dengue and other diseases. These factors have also been included in the Figure 12 below. Flooding also caused sewages to overflow and contaminate wells and rivers leading to more water-borne diseases (IFRC, 2018).

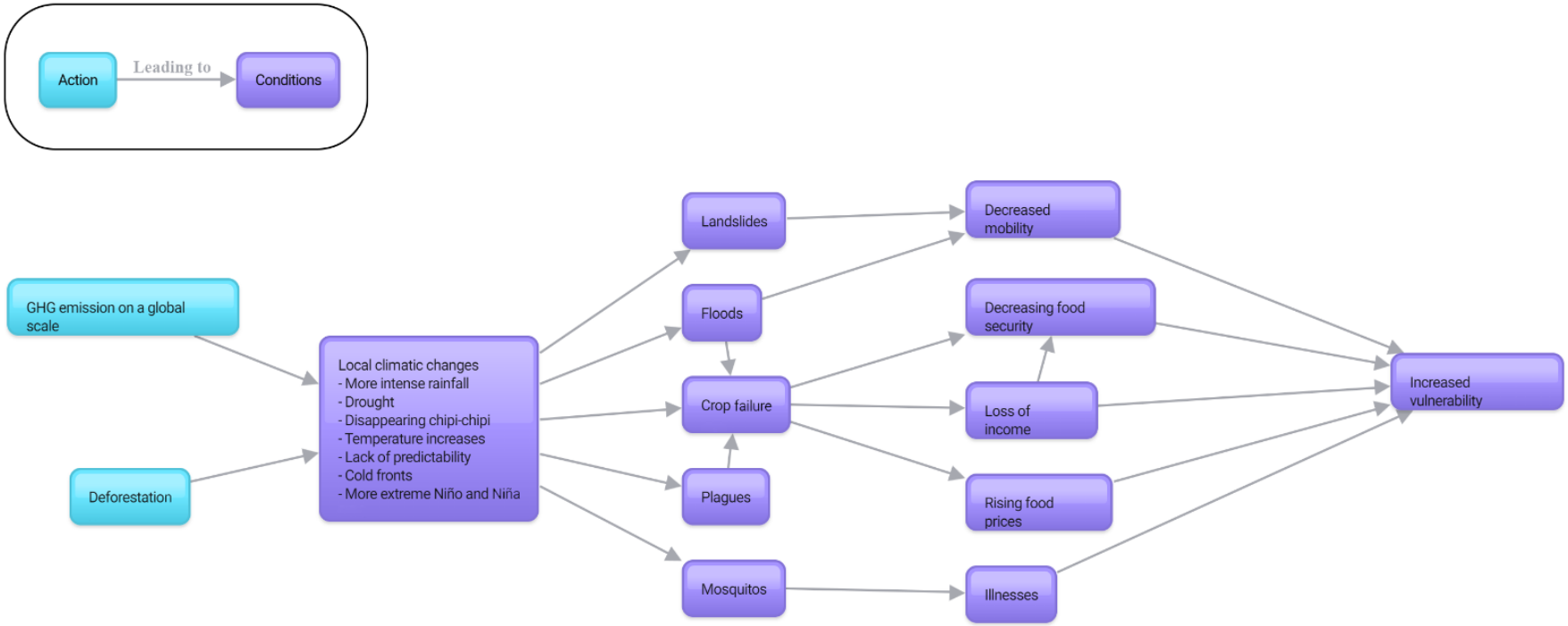

Figure 12 Linking climate change and vulnerability in Alta Verapaz (own figure)

From the findings presented above, a pathway connecting climatic changes and increased vulnerability was articulated and is presented as a stream in Figure 12 Linking climate change and vulnerability in Alta Verapaz (own figure).

5.1.3 Referencing the stream

In the following, a clarification of the links between the individual connections in Figure 12 and the data collected will be presented beginning from the left.

Much research has supported that GHG emissions have an impact on climate change which is also in this study supported by INSIVUMEH. However, this institution also points to the deforestation as an escalator of local climate change. These changes in climate have multiple implications of which this study has decided to highlight the ones most important for this topic.

The risk of flooding is being repeated by several NGOs, INSIVUMEH, experts and 23% of the survey responders in the open comment section and connected to the changing climate. The intense precipitation is causing inundations and landslides, which is supported in documents from 2017 from a NGO and mentioned by two survey responders and in articles from for example FloodList, an EU funded initiative reporting on floods around the world. It is found through survey responses, in reports from NGOs and in interviews with one NGO that these effects are limiting mobility, access to school, work and as well as the access of aid.

Inundations are also damaging fields, as backed up by both survey response, an expert interview with a relevant government body and an NGO. Simultaneously, crop failure is also caused by the rising temperatures and droughts as also confirmed by relevant government bodies and survey responses. The changing temperature also has an impact on plagues that in turn have a negative impact on crops, which is being supported both through NGOs and a survey response.

The study finds through interviews with government institutions that the impacts on the crops are causing food insecurity and that this in turn causes the prices to increase. Furthermore, poor harvest result in a smaller portion being sold and therefore the income decreases. These effects were mentioned by an NGO and in the survey.

The rising temperatures also influence the life cycles of insects. Mentioned specifically in this study, the problems with increase in mosquitos leading to an increase in diseases such as dengue and zika is being supported by two governments bodies as well as in informal interviews. As a result, these elements are increasing vulnerability in the context of Alta Verapaz.

5.1.4 Climate change, environmental change and vulnerability

Climate changes described in the interviews were remarkably in line with those found in INSIVUMEH's dataset. However, the fact that those surveyed did not always attribute environmental changes to climate change means that they might not act on these changes in the same way as if they did.

The representative of INSIVUMEH mentioned that they are distributing the data both to the public through radio and to CONRED, however, no one in institutions mentioned documents from INSIVUMEH of actual changes, which might suggest that they are not directly taking into account the changes recorded by INSIVUMEH, but rather the perceived changes.

Climate change increases vulnerability in various ways, in terms of impacts on personal safety from houses being damaged, limited access from infrastructure damage and decreased food security and financial stability from failing crops. This is important for the risk of violence in that smaller impacts are having larger consequences on the stability of the system. Though fragile systems and increased vulnerability do not necessarily lead to violence, pressure on people's coping strategies is increased.

5.2 Dealing with Climate Change – Adaptation Strategies and Programmes

5.2.1 An incomplete institutionalisation of climate change

The interviews revealed that the theme of climate change from an institutional perspective is fairly new in Alta Verapaz and has not yet found its place in the administration, which means that there is yet no institutional branch dealing directly with the issue. Government officials in various departments perceived that government institutions have a responsibility in relation to the climate change issue. However, no respondent saw it as their institution's specific task to do so, albeit the fact that three interviewees were from public institutions part of the Climate Change Council according the 2013 Climate Change Law. The law clearly states that:

> *"The functions of the council will include the regulation, the supervision of the implementation of actions and resolution of conflicts, to follow up on the implementation of the actions derived from this law, including the national policy of climate change, the climate change fund, the strategies and the plans and programs in mitigation and adaptation to the impacts of climate change".*

Referring to climate change, one respondent stated: "*Yes, it is something, but it is not yet our problem*" (government official 1). It may be that at a national level the issue is receiving more attention, but this had not been transmitted, or it seems even communicated, to the departmental level. However, referring more to the national level, one respondent noted:

> *"There is a law for climate change, but we do not apply it. We are signatories of many international conventions […] but these are not applied" (key informant 1).*

One reason for this lack of engagement is the *insufficient funding and resources* required to initiate efforts (see Figure 13). Many of the institutions referred to having too few staff to provide even the basic services they are mandated to carry out. Moreover, according to the law, the fund for climate change is the responsibility of the MARN, charged with creating a carbon market as one of the funding mechanisms for the implementation of adaptation and mitigation activities. However, according to one respondent, no effort was made to implement it (key informant 1). Other respondents did not even mention it when asked about climate change funding, suggesting a general lack of knowledge about the climate change law and its implications, even within ministries who are part of the council.

This lack of funding was related to the neoliberal doctrine adopted by the country in the 1990s. One key informant explained that Guatemala's public policies have been inspired by a neoliberal doctrine, with the notion that the market will solve the inherent problems. Efforts were made to attract private and international investment, including generous fiscal incentives and lax regulation regarding natural resource management.

> *"The proof lies with rivers and hydroelectric power plants, or the use of underground resources, the metal industries, the extraction of minerals […] They are allowed to act without rules, as they fancy, as though it is theirs, private" (key informant 1).*

Without collecting an income tax from these companies, the riches of Guatemala's resources are concentrated in the hands of a few, and resources cannot be made available for social programmes, including those for climate change. Another factor undermining much of the political process surrounding climate change is *corruption*. One interviewee stated that *"corruption, from the state level down, is what makes all these programmes fail".* The little that should be taxed is not being done and much of it is lost in the process. Same goes for international aid, which *"never ends up where it should" (NGO C).*

"Together with the municipality, we did a study regarding taxes: this company [hydroelectricity] should legally have paid 250 million. It only paid 12 million." (key informant 2)

These factors combined lead to the lack of ownership and initiative amongst government institutions (Figure 13), further resulting in each institution having programmes only indirectly linked to climate change and done so in isolation from the remaining institutions. *Lack of coordination* and *lack of information sharing* were mentioned when describing collaboration between institutions and organisations. One respondent noted:

"We have the problem that many times there is not a good interrelation between the institutions, not even with the government" (government official 1)

Regarding information, each institution has access to little information and what is available is not shared (government official 1). One respondent did mention a working group at the departmental level for risk management, where both government institutions and NGOs can participate and coordinate efforts (NGO B). However, it was described as highly bureaucratic with many discussions leading to few actions (NGO B). These different elements have been represented as boxes in Figure 13, with the connections made above illustrated by arrows.

5.2.2 Effectiveness of existing adaptation programmes

When asked about adaptation and mitigation programmes in place in Alta Verapaz, interviewees mainly referred to the government programme carried out by INAB (the National Institute of Forests), which incentivises land owners to plant trees on their land. However, in an open question, one survey respondent pointed out that *"the government gives money to reforest, so people cut down trees in order to receive the money to then reforest. There is a perverse incentive. There is no incentive from the government to conserve resources".* Another climate change related programme was being carried out by MAGA, to help communities improve their sowing practices and recommend better seed varieties. When asked about their programmes, CONRED referred primarily to their efforts towards improving infrastructure safety in the area. No other actions to mitigate or adapt to climate change were described, although this could be explained by the fact that their staff of just two people was struggling to cover the risk reduction requirements of a whole department. One respondent noted:

"We do not have the resources to have a presence everywhere. We can only reach the municipal level. We try to reach the local level through NGOs" (government official 3).

However, the NGO-government relationship was found to be a peculiar one. One member of an NGO noted that they collaborate with some ministries through the working group, where agreements are made to share resources, since some may have funding but no staff and vice versa (NGO B). However, another NGO respondent noted:

"The government should guarantee the conservation of natural resources but is not doing so. […] When the government allows us to work, we work. When they don't, we work anyway. We will always work, with or without the government" (NGO A).

This demonstrates a willingness to collaborate with government institutions from the NGO's part, as well as an acceptance that they will take on the responsibility to make an effort to reduce vulnerability, regardless of government presence. However, it was also mentioned that the central government is trying to pass a law regulating the presence of NGOs. The result of the law, supposedly, would be that NGOs working to protect the environment and community rights would have to coordinate or get permissions from the Ministry of Electricity and Mining (MEM) (key informant 2) – the same ministry that is allowing the large mining and hydroelectric companies to deplete the resources that the NGO is there to protect (Aguilar-Støen & Hirsch, 2015). One respondent explained that there are civil society organisations helping communities adapt to climate change, but that their presence is declining since much international cooperation is leaving the country, "*sometimes due to pressure from government policies"* (NGO C). Moreover, it was stated that civil society associative network is weak:

"on the one hand due to the aftermath of armed conflict and the corruption generated by drug-trafficking in the area, and on the other due to the fact that social organisations are very tied to political parties, very fragmented to the left" (NGO C).

These conditions make it hard for NGOs to effectively carry out programmes. However, the reach of the programmes, both government and NGO led, was further limited by two main factors: the *lack of access to communities*, both physical and in terms of acceptance by communities, and the *vested interests* of aid providers in choosing the communities they were helping (see figure 13). The first was attributed to the poor conditions of roads in the area,

where many remote areas were not accessible by vehicle, and worsened by poor maintenance, as heavy rains and landslides cut off access. Not only does this cause difficulties in providing aid, it also limits farmers' ability to get their products to main markets. In the latter case, it was explained that due to inter-community conflicts over benefits offered in compensation for hydroelectric projects or over land, some communities refused to collaborate with NGOs who were also helping communities they were in conflict with (NGO B).

The second limiting factor to programme reach was termed *vested interests.* Some programmes are initiated and carried out "*but they don't pay much attention to the communities where they don't have businesses"* (NGO C). One government employee noted that where cardamom is being grown, there is more aid: *"It will depend on who is there in the region, because if there are important people who've invested a lot of money, they offer help"* (government institution 5). This skewed distribution of aid results in the neglect of areas where aid is needed most. This barrier to adaptation has been included in Figure 13.

In the programmes mentioned, only one NGO was found to integrate conflict sensitivity in their programme design in a systematic way. Others just mentioned the precautions taken in terms of safety for their staff and understood the question as conflict between the organisation and the community, rather the potential for creating or worsening conflict situations in a broader sense.

5.2.3 Individual level adaptation measures

The outcome of the above-mentioned factors is the lack of supported and coordinated adaptation measures being implemented in rural communities in Alta Verapaz. This lack of institutional aid means inhabitants are dependent on developing their own adaptation mechanisms. The two main adaptation strategies found were *migration* and, related, *land occupation.* See Figure 13 for a visualisation of how self-adaptation methods were found to be linked to vulnerability and risk of conflict, as described below.

Migration was described as interdepartmental, to Petén or Izabal, or as migration towards cities, *"where people only have enough to buy a small space, in areas vulnerable to landslides"* (government institution 3). Migration was said to be driven by the expansion of land used for monocultures for agro-export, which has forced people to move (government institutions 4 and 6), by a lack of economic resources, even in cases where the soil is fertile (government institution 3) and by a deterioration of natural resources, mainly caused by deforestation (government institution 6). The new areas in which people settle are often protected areas,

private property or land already being used by other communities. This migration wave was linked to conflict:

> *"Two dynamics emerge that can turn into conflict: firstly, the occupation of farms, which peasants claim as national. Secondly, the occupation of protected areas. In both cases, these can become violent when the state makes use of legal mechanisms for the expulsion of communities"*
> *(government institution 6)*

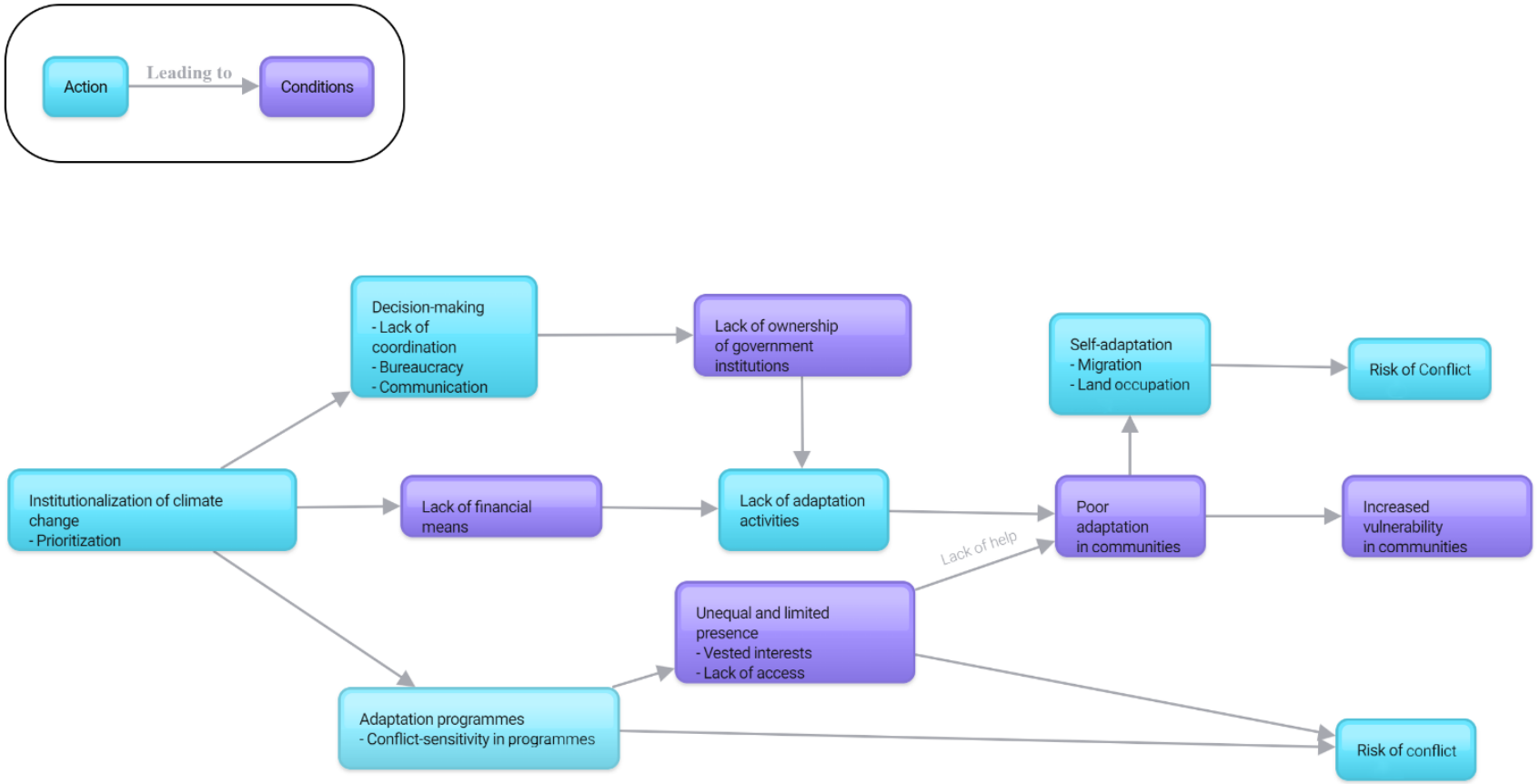

Figure 13 Adaptation strategies and programmes stream (own figure)

5.2.4 Referencing the stream

The following section explains in more detail how the collected data supports the relationships presented in Figure 13. Beginning from the left, the data analysis show that what is lacking is both financial resources and the ability or willingness to improve collaboration.

As a part of collaboration difficulties, poor information sharing was mentioned several times during interviews with government institutions as an explanation for the lack of coordination. The same institutions perceived that the responsibility to deal with climate change on an institutional level did not lie within their mandates. Moreover, the lack of financial resources was mentioned explicitly several times, both by NGOs and government institutions as an explanation for not engaging in more projects. These two factors were explanations for lack of adaptation activities amongst the government institutions.

That the aid that is employed is being distributed unequally is being supported both by an NGO, by a community leader, and by a government institution. The reason behind this was said to be rooted in vested interests, where interventions were made only in areas where they businesses, but all three respondents also mentioned lack of physical access to communities further out.

This in turn has a negative effect on adaptation at the community level. This is generally agreed on and mentioned specifically by both NGOs and government agencies. Adaptation measures adopted in the communities are therefore mostly done by the communities themselves. The primary forms, mentioned by most were migration, mentioned in six interviews and land occupation mentioned in two. Both measures were mentioned by respondents from government institutions and NGOs. Occupation of land was identified frequently and by a majority of the interviewees as a root of conflict, but not always in relation to adaptation.

When asked about the conflict sensitivity of the efforts, only one NGO was consistently including it in their program interventions, while other NGOs and government institutions were not, and one was even actively choosing not to engage in such efforts based on an argument of neutrality.

5.2.5 From institutionalization to conflict risk

The findings were linked in a stream, presented in Figure 13 Adaptation strategies and programmes stream (own figure), beginning with the prioritization from the state side, both in term of budgetary prioritization and engagement in the area of climate change. The latter results in government institutions not taking responsibility or ownership of the issue. Combined with

a system which is not performing so well in terms of communication and coordination across institutional boundaries, the result is few and dispersed adaptation activities. The lack of budgetary prioritization also limits the ability to engage more in the issue. The limited adaptation activities contribute to poor adaptation in the communities. The findings also reveal an unequal distribution of adaptation activities which leads to the most vulnerable places not receiving any aid. This in turn leads people in such communities to adopt their own adaptation mechanisms, for the most part migration and land occupation, which have been linked to conflict.

Incorporating conflict sensitivity into a programme or effort demands expertise in both the area that the programme is targeting (for example climate change adaptation) and in the topic of conflict as well. This calls for cooperation between institutions, which in the context of Alta Verapaz has been found to be poor. This can lead to an increased risk of conflict, as tensions already exist and there is generally a lack of trust in government institutions in the region, evident in the survey responses. This links to the findings from a study in which a lack of coordination when conducting adaptation efforts was found to lead to adaptation in one area and maladaptation in another (Feola et al., 2015).

This can have cascading effects because of the adaptation mechanisms chosen by the local population. For many years, there have been internal conflicts of land in Alta Verapaz. This is worsened as people are forced to leave their territory and migrate into already used land to sustain themselves in poor conditions (Zepeda Gaitán, 2016). The worsening conditions derive from a combination of climate changes making the conditions for agriculture harsher, land grabbing by large monoculture agro-industries and the lack of adaptation measures and aid from the state.

Since migration and land occupation were the primary adaptation measures found, one likely explanation is people's low adaptative capacities, limiting their options. Poverty and limited access to resources play an important role in terms of what options people have. Additionally, the poor understanding of climate change that people in the department were generally found to have, due to low education levels and poor communication from institutions, could also be a reason for these measures to be taken, which are more likely to result in conflict situations than would other adaptation measures.

5.3 Large-Scale Land Acquisition and the Extractive Industries

5.3.1 Big businesses and their impacts

When asked about the main causes for conflict, all interviewees agreed on land rights as the major driver. Land issues were also tightly linked to the presence of hydroelectric and mining projects as well as the growing areas of land dedicated to monocultures for agro-export.

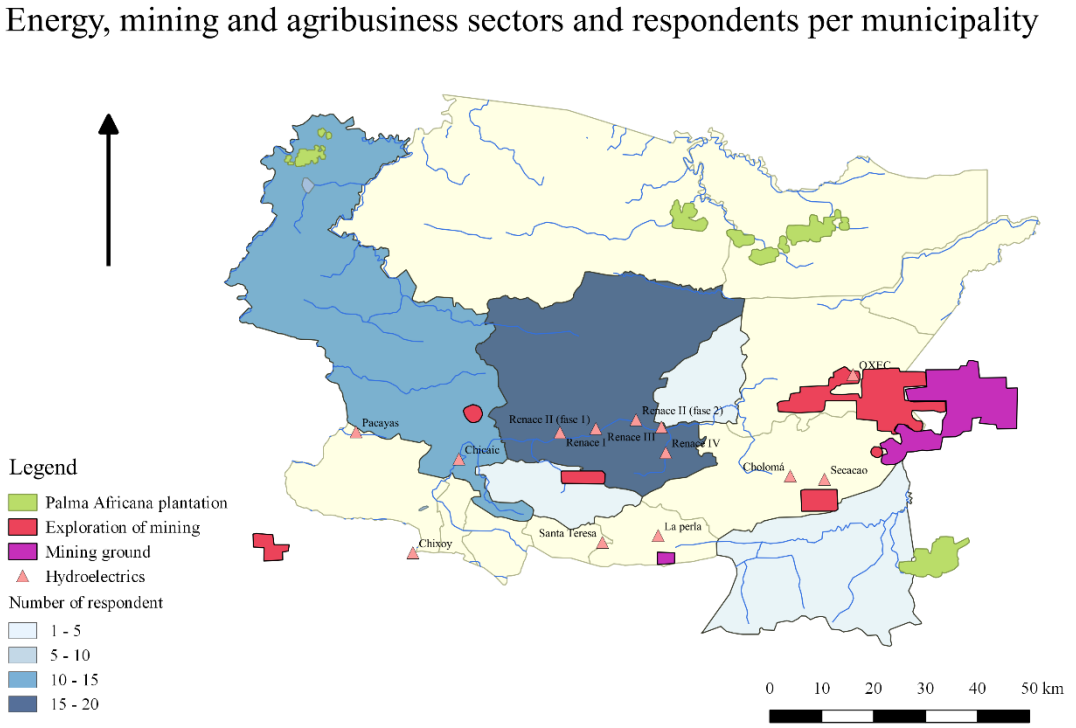

Figure 14 Map of Alta Verapaz: energy, mining and agribusiness sectors and respondents per municipality (own figure)

In response to the survey open question: *in your opinion, what are the main causes for conflict today? List and rank different causes*, the three causes cited most often were *governance issues, land conflict* and *hydroelectric power plants/river use.* However, it must be noted that respondents came from districts in which hydroelectric power plants were operating. None came from the north of the department, where conflict dynamics are centred around the Palma Áfricana plantations, or from the east, where large mining grounds are located, or mining exploration is being carried out. This can explain the few mentions of monocultures or mining as causes of conflict in the surveys, as opposed to results from the interviews. Figure 14 Map of Alta Verapaz: energy, mining and agribusiness sectors and respondents per municipality (own figure) shows a map of the location of energy, mining and agribusiness projects in the department, along with the number of survey responses collected from each municipality.

Hydroelectric power plants

In recent years, many hydroelectric powerplants have been erected and excavations made for sites of operation (Alianza por la Solidaridad, 2014). This has been encouraged by the ambition of promoting private investment in the country. The excavations for the sites and operations of the plants have large impacts on the surrounding ecosystems and the resources available (Business Human Rights, 2017). This is true for example in terms of water, where dams are constructed for hydroelectric powerplants which alters the river flow (Business Human Rights, 2017). One respondent described their actions:

> *"There is a hydroelectric plant that diverted the water used by communities. They made an arrangement so that they had a little water, so as not to leave them completely without water. What happens is that in times of drought, the hydroelectric needs as much water as possible. So, they cut off the water to the communities. The community is affected because they no longer have the water needed to sow and they lose their crops. And on the contrary, during the winter, the hydroelectric plant is filled with water due to the excess caused by dams, so they come and let the water out, flooding all of the communities' fields." (NGO B)*

This complete control over water resources leaves surrounding communities at the mercy of the hydroelectric plants activities. Both the hydroelectric power plant and the farming communities depend on the weather for energy or food production, but the hydroelectric company has the power and resources to expropriate and control the water resources. One government official also admitted: "*I think that within the state, some people have been wrong in authorising the production of mines and the construction of hydroelectric plants, because there are videos, there is information about those who make these contracts, private initiatives to change the course of the rivers" (government institution 2).*

Moreover, interviewees talk about the violation of community rights to consultation, written in the International Labour Organisation (ILO)'s Convention 169, which sets the right to Free, Prior and Informed consent. On the contrary, descriptions made by interviewees of the consultation process show that these are made after the project has already started and do not inform communities of the project. These violations of human and community rights and their relationship with the risk of conflict have been illustrated in Figure 16. This was elaborated on during an interview:

"They never consulted us. We saw they had already started the construction and then what? Their consultation was to come to the communities and survey the people: "would you like work?" The people answer yes. "Would you like a school here?"" Yes." "And you would like a project?" "Yes". "Sign here then, this is the consultation". […] This is not free, prior and informed. They have violated a right" (key informant 2).

Many respondents also pointed out that these hydroelectric companies are exempt from paying taxes: *"they do not pay any kind of royalty to the state" (NGO C)* (see Figure 16). In order to buy or maintain peace or silence from communities, they offer small projects or gifts that offer no real economic benefits. A few of those mentioned were small food parcels, very short-term employment, football pitches, small parks, school equipment and unkept promises (key informant 2, NGO A, NGO C). Furthermore, the electricity generated by these plants does not reach the nearby communities but goes to urban areas (key informant 2).

Mining

The advent of foreign mining companies began with passing of the Mining Law in 1997 (the draft of which was heavily influenced by foreign investors and private companies (Aguilar-Støen & Hirsch, 2017)), proving favourable conditions such as few royalties and no accountability to communities of the surroundings. This included unlimited access to rivers and lakes to use for the water-costly operations[1] (NISGUA, 2017).

Along the years, mining operations have been a cause for conflict partly because of the difficulty in competing for resources (Aguilar-Støen & Hirsch, 2015) and degradation of the surrounding environment, generating profits that are not benefitting the surrounding communities (Wayland & Kuniholm, 2016). However, conflicts have also emerged from "*the inability or unwillingness of the government to effectively implement existing environmental laws, protect community land rights, and equitably arbitrate conflicts involving natural resources […]"* (Wayland & Kuniholm, 2016). Moreover, how the protests and opposition have been managed by the companies, criminalising, threatening and attacking defenders of human rights and the environment (NISGUA, 2017) have also led to conflicts.

Although favourable conditions have been created for the mining industry through the law, an informant from an NGO (C) dealing with such themes, states that some companies have been

[1] According to Alianza por Solidaridad (2014), one mine (Marlin) uses in average 250.000 litres per day.

obtaining licences illegally through means of corruption (NGO C). As in the cases described in the section on hydropower plants, mining companies have also been known to take advantage of low education levels and limited understanding of the effects of mining operations within communities. Aguilar-Støen and Hirsch (2015) describe how such deceptions are conducted.

> *"In other cases, residents were invited to hear a presentation about the benefits of mining or hydropower development, in very general terms. Community members reported in our interviews cases where at the end of a meeting they were asked to write their names on a sheet of paper without the consultant explaining what the signatures were going to be used for."*
> *(Aguilar-Støen & Hirsch, 2015)*

The authors continue demonstrating examples of how some companies hire "*experts on indigenous people*" to gain support in the communities to complete projects (Aguilar-Støen & Hirsch, 2015). They further argue that the act of hiring such 'experts' "*suggests that such companies do not really see it as necessary or legitimate to involve local communities in their plans.*" (Aguilar-Støen & Hirsch, 2015). The concept of consultation in communities have also been included in Figure 16, illustrating how that contributes to increasing the risk of conflicts.

Monocultures – Palma Áfricana and Sugar Cane

Monoculture plantations, especially plantations of Palma Áfricana, have been increasing in number since the introduction of the crop in the mid-1980s (Guereña & Zepeda, 2013), growing from 31.1 thousand ha in 2003 to 152.7 thousand ha in 2014 (Zepeda Gaitán, 2016). As of now, the cultivation and production has been very centralized, only being split between five companies (Guereña & Zepeda, 2013). The companies behind the plantations are buying up land and putting fences and gates around it, effectively cutting off what was once used as communication and transport routes for the locals.

This is indirectly pressuring small-scale farmers to sell their land because they are surrounded. With a palm oil plantation very close, the small-scale farmer runs the risk of setting the palm trees on fire when burning waste products, a traditional agriculture method. This has led to very expensive consequences for them; companies demanding up to 75,000 Quetzals (over 10,000 USD) per individual tree as compensation (Guereña & Zepeda, 2013). This results in many farmers selling their properties.

Furthermore, the industry is known for deforestation, which at a local level limits the availability of firewood that many depend upon (Guereña & Zepeda, 2013). Using pesticides, monoculture has also been known to pollute nearby rivers, killing fish and having negative impacts on both flora and fauna. Although the companies claim to participate in reforestation efforts, the opposite has been found to be true amongst previous researchers (Guereña & Zepeda, 2013) and interviewees in this study.

This expansion of production of palm has limited the available land for local agriculture, which has a direct impact on food security since there is less land being used to make food crops. Moreover, the increase in production of palm oil also causes rents to go up, which is relevant for the many families who rent their land to grow crops rather than own the land themselves (Guereña & Zepeda, 2013). It has been observed that this has caused a shift from families being self-sufficient to them depending on employment from palm oil companies. People buying rather than growing their food has been linked to food consumption of lower nutritional value (Guereña & Zepeda, 2013).

5.3.2 Land grabbing and corporate social responsibility

Though the three large types of corporations and industries presented above have their differences, the similarities in their impacts and behaviour are such that we refer to them hereafter as “big businesses”. The reason for this is the inherent similarities in the depletion of resources and in handling opposition from surrounding communities. The companies’ operations are causing degradation of biodiversity and tougher conditions for agriculture and livelihoods due to the impingements on community rights to resources. This leads to an increased vulnerability in terms of higher food insecurity, illustrated in Figure 16.

Parallel to the operations, mining, monocultures and hydroelectric companies were all found to be guilty of violating the rights to free, prior and informed consent and to offer compensation for their damages in the form of false economic benefits to give the image of CSR. Cases were also described in which bribes and threats were made to ensure the operations could go ahead. In many cases, communities were cheated into signing agreements, by promising construction work and taking advantage of the low education levels and poor understanding of the outcomes of the decision. Moreover, it has been noted by a previous study that motivated by approving Environmental Impact Assessments faster, changes within MARN, including manipulation of evaluation, monitoring and control have been made. Other ways include bending the rules in

such a way that the hydropower plant falls under a category of less strict terms (Aguilar-Støen & Hirsch, 2017).

In order to get the projects approved in the first place, the companies need permissions from the government and from the communities living in the areas. Though the government is already willing to welcome private investments and is creating beneficial conditions such as tax relief, an NGO representative noted that the financial power of the corporations also allows them to pressure the government financially and by those means get the desired approvals needed to initiate the projects (NGO C).

However, the dynamic in these companies' access to land is essentially one of land grabbing, *"the acquisition or long-term lease of large areas of land by investors"* (de Schutter, 2011). The agrarian system in Guatemala prioritises the access to land for companies rather than smallholders. The results of these large-scale land acquisitions (LSLA) is displacement, impoverishment and increased vulnerability in the face of climate change, as well as social and political conflict in a context in which the risk for violence is high.

5.3.3 Political and Social Conflict

Three different conflict dynamics were described: the first was between communities and intra-community, the second between communities and the companies and the last between communities and the state. These different conflicts were characterised by different dynamics and processes.

Inter-community conflict is *"precisely because of the companies' presence" (NGO C)*, as compensations were provided to only some communities, while the negative impacts affected them all. Conflict and divisions arise "*because some communities are in favour of the projects and others are against it" (government institution 4).* Disputes occur between the people who sold their lands and those who refuse to do so.

> *"The conflict arises due to companies obtaining privileges by buying people's wills and I'll be sincere that the poverty we face is such that people sell themselves" (NGO C)*

Some communities have started a form of resistance in which they refuse any sort of engagement with companies, be it to sell their land or accept job offers, gifts or small projects (key informant 2).

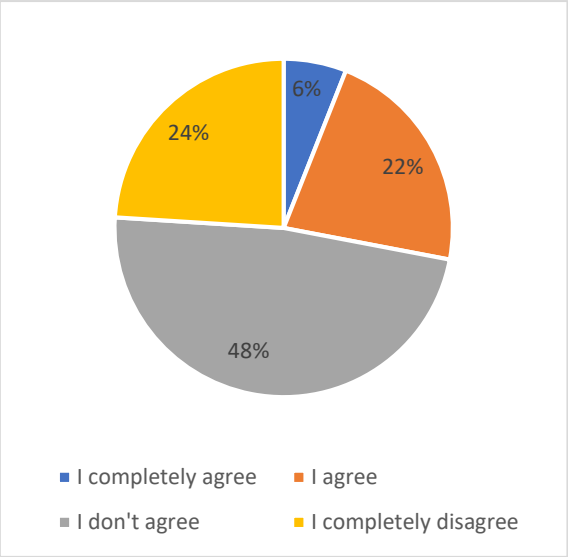

Figure 15 Percentage support for the use of violence in support of a just cause in Alta Verapaz

The conflict between communities and companies and the state is rooted in the way companies are taking advantage of them and taking control of resources in the area. These conflicts have the potential of turning violent due to the way conflicts are being managed by the government and the corporations. Strikes and protests are not met with negotiation or understating but rather by either the use of force or the criminalisation of community leaders (Rodríguez-Carmona & Romero, 2015). In this study informants expressed fear of their names being published due to fear of recrimination. The criminalisation of protest is leading to a greater sense of resentment towards the companies and the government. There have been reports of arrest warrants, injuries, imprisonments, and threats made against environmental activists (Business Human Rights, 2017). There have also been unreported cases of sexual assaults on indigenous women supposedly done by employees of hydroelectric plants (Business Human Rights, 2017).

The way these conflicts are managed, with force, criminalisation and violation of human rights, in turn increases the intensity of the conflicts and makes resorting to violence perhaps perceived as needed to confront the situation.

> *"They can turn violent from two perspectives. First, when companies use private guards to evict or intimidate communities. Second, when the judicial route is used to suppress or also intimidate communities" (government official 6)*

In the survey questionnaire, when asked: *How much do you agree with the following statement; "In this area, it is sometimes necessary to use violence in support of a just cause"?* the results showed that 28% agreed or strongly agreed with the statement.

From the findings presented above, a pathway connecting state governance and increased risk of violence and vulnerability has been developed and is presented as a stream in Figure 16 Large-Scale Land Acquisition and Corporate Social Responsibility stream (own figure).

5.3.4 Climate Change as a player in the Land Grabbing conflict

Despite several reports revealing the violation of human rights and violent responses to opposition of construction of such projects, these are being funded by international organisations. An example of this is the power plant at Santa Rita, which is supported through the Clean Development Mechanism initiative by the UN (UNFCCC CDM Executive Board, 2013). This funding suggests that the international community is not aware of, or is blind to, the circumstances under which the operations are being carried out. In informal interviews carried out for this study, cases of the government silencing journalists reporting on the issues mentioned were perceived to be common.

This support comes from a strong narrative at an international level in climate mitigation, where the demand for clean energy is encouraged and growing. The irony is that this very narrative is what is pushing for these land grabs to occur in the first place. The increasing demand for bio-fuels and conservation areas to mitigate the effects of climate change makes it profitable for companies to expand their operations or land. This expansion is made at the expense of small-holders and the environment (Foran et al., 2014). Similarly, the increase in monocultures is also driven by the rapid increase in the world's population, despite the growing body of evidence on the unsustainability of the conventional intensification of agriculture and monocropping (Garibaldi et al., 2017). However, climate change is making the effects of land-grabbing on vulnerable communities harsher, in terms of increased food insecurity, displacement and social conflict.

The positive outcome that emerges in Alta Verapaz are the few NGOs, particularly MadreSelva, who are working with vulnerable and marginalised communities, informing them of their land rights, and empowering them to continue resisting, peacefully, against these abuses of rights.

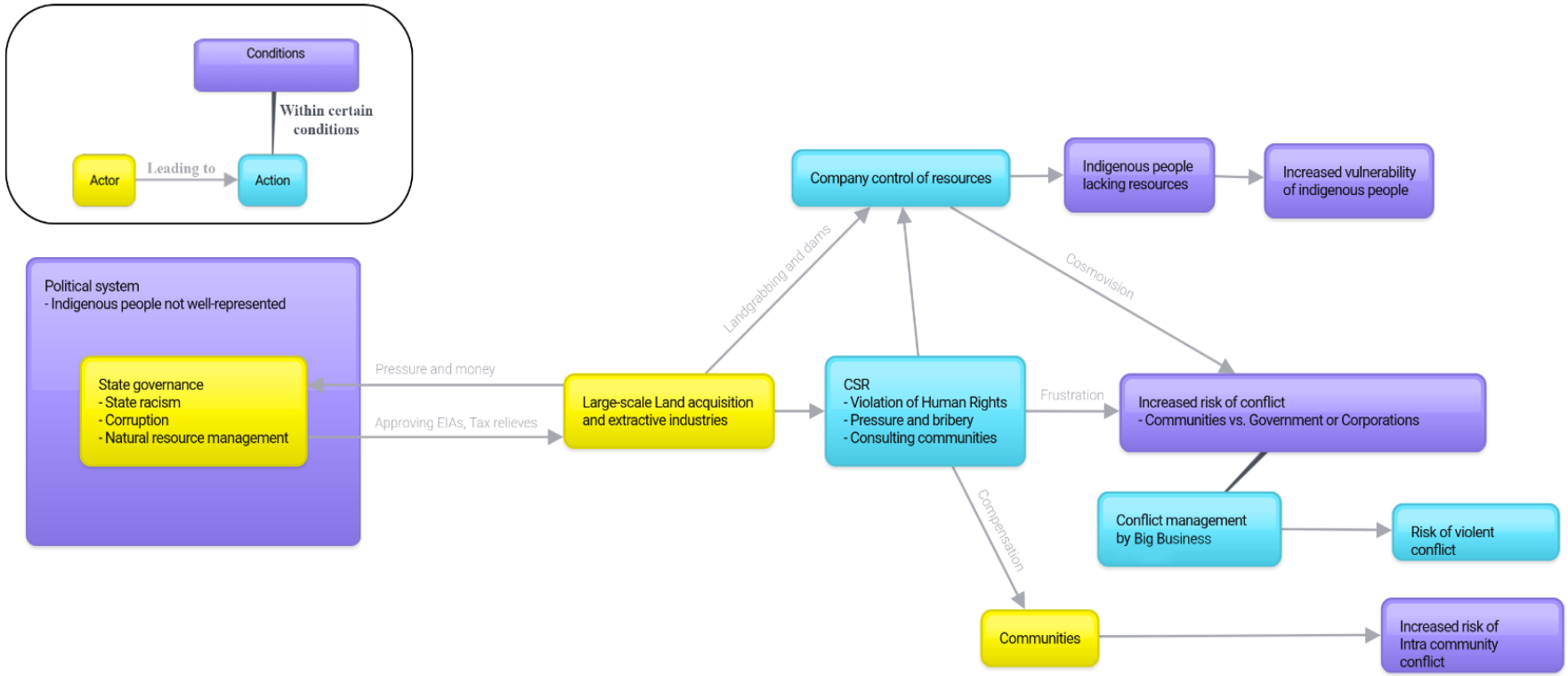

Figure 16 Large-Scale Land Acquisition and Corporate Social Responsibility stream (own figure)

The fault does not lie solely with the private companies and their poor or non-existent CSR efforts. Much of the blame rests with the Guatemalan government too, in their choices made to attract these investments, the poor regulation enforced and the rampant corruption undermining the efforts that are made. Structural racism and the overlooking of indigenous communities' interests from a governance perspective can also explain why their cosmovision is not being taken into consideration when allowing these industries to operate in the area. The lack of interest and general perception of Mayan cultures as 'lesser' is in line with the poor representation of indigenous people in the political system (Wayland & Kuniholm, 2016).

5.3.5 Referencing the stream

In the following section a closer description of which sources have supported the establishment of the links in the illustration above (figure 13) will be presented, beginning from the left.

The lack of representation of indigenous people has been mentioned both by a local community leader, an NGO and in the survey. A document from Comité de Unidad Campesina (Zepeda Gaitán, 2016) also reports racism in the political system towards indigenous people.

That the government is engaging in corruption is widely known and is supported from various sources in this study; from the corruption perception index, a document from an NGO, a local community leader, a local NGO respondent, from the ministry of environment and several survey responses.

The data show that the operations around LSLAs are having an impact on the surrounding ecosystem and making people vulnerable, stated in reports from NGOs, interviews with NGOs, a community leader and in the surveys.

Several NGOs have confirmed that large companies are trading the rights to resources for small parks or a day of medical attention and that they in some cases are violating human rights. Moreover, a report from a collection of local NGOs reveals more than ten cases where human rights have been violated by hydroelectric power plant companies. Rights violations were also mentioned in the survey. It is vastly agreed upon, by reports from NGOs, in interviews with NGOs, community leader, and with a government institution, that large companies disinforms communities, make decisions before carrying out consultations or fail to consult at all.

That the indigenous people are lacking resources because of the operations of large companies and that this is contributing to a context that allow for conflicts to arise has been supported by

expert interviews, NGOs and reports as well as from government institutions in this study. The same pool of sources highlights the violation of human rights and lack of fair consultations as another important contributor. Cases in which these conflicts turn violent have been documented by NGOs, chiefly caused by the companies' or state's violent response to conflict. A community leader mentioned that hydroelectric powerplants are causing conflicts between communities due to their bribe offers.

5.4 Contextualising the Pathways

5.4.1 Determining conditions

The streams cannot be well understood without considering the context in which the links and relationships were made. Historical factors have an impact on the present. The 36-year long civil war that ended in 1996, during which many kidnappings and massacres occurred, has left scars and grievances. The continuing living legacy is evident in everyday life, on street posters and articles in the papers. This has, and still is, creating a division of people and has also caused a decreasing feeling of unity and nationhood amongst the inhabitants of the country. For instance, many of the survey respondents still feel more "Q'eqchi'" or "Ladino" than "Guatemalan". This division from the past is further underpinned in the present by the lack of prioritisation of indigenous people by the government and the embedded state racism.

Globalisation in its extreme neo-liberal form is also having a profound impact on Guatemala, amongst other things resulting in opening the country for many international companies and allowing for resources to be extracted in order to advance the national economy. This is set in a wider context of fragility in the country, manifested by poor social systems, infrastructure and enforcement of laws and restrictions on the government and large companies.

This combined with the embedded corruption in the political system is creating conditions of low resilience for indigenous people, but also a lack of trust in the government and in government institutions. This is being reinforced by the government's lack of aid and the support of large companies that are violating rights and asserting control over resources, which in turn increases the likelihood of conflict.

5.4.2 Relating the streams

The streams are not isolated. They are created by the authors from the strongest links of the web of relationships found in the studies and separated for clarity. In the following, some of the

crosscutting relationships between the streams and some connections between them are presented.

Vulnerability

A common factor in the three streams is vulnerability of communities which the stressors presented in the streams are all impacting. The stressors are increasing the vulnerability, making the community vulnerable to other stressors.

The increase of vulnerability derived from companies' control over resources can lead to increased adaptive capacity through financial resources, health checks or increased access to education from the compensation by the companies. However, from the interviews conducted, this trade-off is not benefitting the communities in the long run. Also, it has been found that the compensation might lead to an increase in intercommunity conflicts, which inhibits the adaptive capacity that would be greater when communities collaborate.

Agriculture

Agriculture is being affected by various factors, as shown in the three streams; from weather conditions, in the first stream and land and water control by agro-businesses, power and extractive industries in the third. The second stream can be argued to contribute through the lack of programmes that could have been expected in such a situation.

Furthermore, the stressors impacting agriculture and thereby decreasing the income and economic power of the local population is also having an impact on adaptive capacity, since the economic power is determining the adaptation mechanisms available.

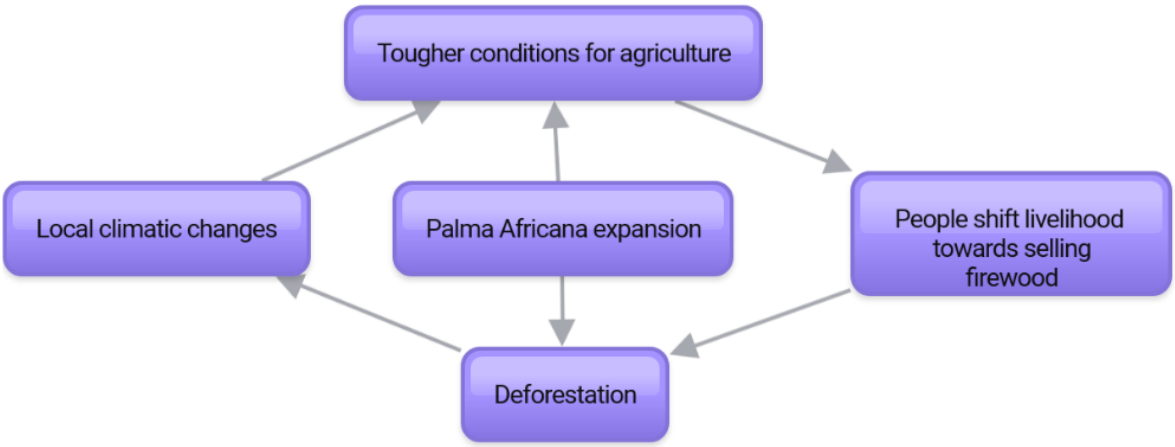

Figure 17 Positive feedback loop of deforestation (own figure)

Deforestation

The streams intersect in other places too. An example is deforestation, that affects the local climate. This is caused by production of Palma Áfricana but also from people cutting down wood to use for fire and sell. This is a vicious cycle where people are not able to sustain their livelihoods through agriculture, because of tougher conditions created by local climate changes and the increase in Palma Áfricana production. People then shift to sell more firewood, thereby causing more deforestation and making conditions for farming life harder still.

5.4.3 Relating the findings to the literature

From the findings and relationships found in Alta Verapaz, this section is concerned with how the findings relate to other studies made on the topic.

The results are in line with findings from some studies regarding the relationship between climate change and violent conflict, where this study finds that there is no direct causal link (Kevane & Gray, 2008; Theisen, Gleditsch, & Buhaug, 2013; Theisen & Theisen, 2014). Rather, climate changes act as an additional stressor on factors that increase the likelihood of conflict to emerge, through increased vulnerability to various risks. One such factor is a negative impact on agriculture due to the changes in temperature and precipitation (Kallis & Zografos, 2014), where droughts and flooding cause harvest failure that in turn decrease food security. With crop failure follows a decrease in economic security and decreased availability of natural resources (Salehyan, 2008a).

Furthermore, state governance is a crucial factor that has an impact not only on the level of vulnerability but also on poverty, which is in line with other studies (KC et al., 2015; Salehyan, 2008a; Smith & Vivekananda, 2007). When the government fails to provide basic services to its people, the legitimacy of the state decreases causing political instability (Smith & Vivekananda, 2007), which was confirmed in the present study and is reinforced by lack of political participation of the people whom the changes were affecting, as also documented by Uexkull, Croicu, Fjelde and Buhaug (2016). Leading up to the political structure and norms is the historical legacy that here was found to be significant in setting the conditions for conflict potential. Smith & Vivekananda (2007) and Wayland & Kuniholm (2016) state that climate being a threat multiplier increases the potential for violent conflict. This study has also found migration to be an adaptation strategy adopted by some people in Alta Verapaz, although not at the scale found in other studies (Helland & Sørbø, 2013; Salehyan, 2008a).

Large-scale land acquisition in prior studies has also been found to lead to conflict between local communities experiencing a decrease in agricultural productivity and industrial plantation corporations in Indonesia (Dhiaulhaq, McCarthy, & Yasmi, 2017) and more generally with large scale mining operations in the global south (Moomen, 2017). Both studies highlight the fact that the broader political and economic conditions shaped by local governments are of high importance in setting the frame within which the corporations operate.

5.4.4 Summary of the climate change – conflict link in Alta Verapaz

Though climate change was found to be both measured and perceived, the driver of conflict potential in Alta Verapaz sits more in the political and economic context. Various stressors contribute to the increase of conflict potential by affecting vulnerability. The conflicts tended to be triggered by disputes over land ownership and unequal allocation of natural resources. The risk of the conflicts turning violent was primarily found in conflicts between communities and large corporations or the government as an outcome of poor management of conflicts over resources and territory. The relationships between the stressors and conditions have been presented as streams describing the dynamics potentially leading to conflict in Alta Verapaz.

Chapter 6: Conclusion and Recommendations

6.1 A complex relationship

This thesis set out to unpack the complexity of the climate change and violent conflict nexus in a fragile context, that of Alta Verapaz in Guatemala.

The relationship was explored by linking different factors to find paths between climate change and violent conflict, with the impact on vulnerability as a key link in the nexus. The impact of different stressors on vulnerability was studied, identifying those which could also transform into the potential for conflict. Not all paths found led to violent conflict and in particular not the one beginning with climate change. Large N-studies attempting to establish causal and simplistic linear relationships would not explain the nuances in the relationship as a case study does. The more focused research provided by this study allows for adaptation efforts and policies to consider these important factors and locate opportunities to build resilience.

What was found to be determining the conflict potential was the concept of vulnerability. The level of vulnerability in Alta Verapaz is being impacted not only by the consequences of climate change, such as intense rainfall and increasing temperatures, but also by socio-economic factors. The changes in climate are primarily impacting agriculture that people are highly dependent upon, but also increase vulnerability by damaging houses and infrastructure as well increasing the prevalence of diseases. Socio-economically, poverty and low education levels are also increasing the level of vulnerability by limiting the adaptive capacity, which due to lack of institutional aid, is not being built. This lack of aid is due both to aid providers' vested interests, who are primarily focusing on areas of economic interest. Programmes are also being limited by the difficult access to places, the lack of funds allocated to climate change and the poor coordination and ownership of the issue between government institutions. The few efforts that are being made to improve adaptation capacity have a narrow focus, not considering the context and the indigenous culture, and therefore risk being counterproductive.

The few and scattered efforts to adapt to climate change are reflected in the perception of the issue not being prioritised politically. In combination with the indigenous peoples' weak representation in the political system, the historical legacy of persecution by the state, and the embedded corruption in Guatemalan politics, the trust in the state system is low, which further increases the potential for conflict.

Big corporations responsible for hydroelectric powerplants, mining or cultivation of Palma Africana are triggering social conflict through the large-scale land acquisition and the monopolisation of resources. These are both of high importance for the livelihood of indigenous people but also have significant cultural and religious meanings. The acquisition of land is sometimes done in questionable ways, due to the lack of enforcement of some environmental laws and the bending of others by the state institutions. Community leaders and communities were also reported to being bribed with money, football pitches or small parks or being cheated into signing agreements without full knowledge of what they were agreeing to. The instances of conflicts between communities is becoming more common as some communities benefit from the compensations while more are sharing the disadvantages. Moreover, these tactics used to initiate or continue operations are triggering conflicts between the communities and the corporations and are escalated by their poor management. Examples include the intimidation of the community member, criminalisation of leaders and some cases of violence.

Although violent conflicts do emerge in this context, the majority of conflicts are peaceful. They are more often legal battles aided by NGOs or protests. However, several people interviewed expressed concern that the conflicts take a violent turn as frustration continues to grow, as their voices continue to be ignored and their rights violated.

6.2 Learning from the case findings

The findings of the case of Alta Verapaz show that climate change is not a direct cause for violent conflict in Guatemala and it is argued that it is unlikely to do so in other cases. Though every context is unique, certain factors such as governance, operations of large corporations and the mis-integration of conflict-sensitive approaches in programmes are more likely to be the underlying causes of violence occurring in a context, where climate change only adds an additional pressure on livelihoods.

The climate caused mass migration narrative has attracted attention in public discourse and media outlets, in which large numbers of people flee their homes, often towards western countries, due to a changing climate leading to local wards over food and resources. This was not mirrored in the findings of this study. Though migration was indeed part of the adaptation strategies found, it could not be called mass migration. Moreover, migration drivers included a combination of various factors primarily related to land use, not solely climate change. Within the group of informants interviewed, migration was said to occur mostly locally, towards the neighbouring department, Petén, and towards urban areas within the department. Though

climate change is contributing to worsening conditions of scarce resources and food insecurity, it was not found to lead to mass migration, and is unlikely to do so in other cases.

Another scenario created by the media and some politicians is the notion that climate change leads to "war over resources". This thesis finds that some conflicts emerged over agricultural land but that was not new and had less to do with food insecurity and more with entitlement. Climate was not the only factor increasing food insecurity. As in the case above, climate alone would not be responsible for such conflicts.

Many other cases can be found where culture differs from one part of a country to another and where certain ethnic groups are underrepresented in the political system. Understanding how an adaptation programme influences not only the specific target of the programme, but also other parts of the context is crucial. When a single-minded focus is employed, ignoring the context in which the programme needs to be implemented, it runs the risk of being counter-effective or causing maladaptation. This finding is not limited to the present case but will be relevant for a broad range of programmes.

LSLA in this case was found to increase resource scarcity for local inhabitants by limiting their access to these resources, not respecting important cultural and religious sites and violating human rights, by taking advantage of poor regulation and a corrupt system. Guatemala is not the only country rich in resources and governed by weak institutions, and it can be taken from this study that this factor could be relevant elsewhere. State governance alone is an important dimension in the debate since the creation of laws and their enforcement is dependent on good governance. Corruption has a big role to play in this and though Guatemala is number 143 on Transparency International's Corruption Perception Index (out of 180) (Transparancy International, 2018), Guatemala is far from the only country where corruption presents a challenge.

The case of Alta Verapaz demonstrates that understanding the impacts of climate change in terms of violence involves taking into account the complexity of the interaction between multiple factors and the reality faced by people at a local level. Several recommendations are put forward to contribute to policy makers' and practitioners' work.

6.3 Recommendations

The following recommendations are made to improve the way in which policies, programmes and interventions targeted towards climate change adaptation are designed. They are formulated to meet the aim of strengthening climate resilience in Alta Verapaz and elsewhere whilst simultaneously reducing the risk of violent conflict. These recommendations are put forward for the Guatemalan government, NGOs, international organisations and researchers engaged in the climate change and violent conflict debate.

6.3.1 Recommendation to the Guatemalan Government

On a departmental level, this thesis recommends that local government institutions' mandates and responsibilities in dealing with climate change are reviewed so a clear list of actions can be formulated and implemented. Efforts need to be made with more collaboration between institutions and with input from the population to ensure that programmes adopt a holistic approach that better considers various aspects of the context. This reduces the likelihood of maladaptation and counter-effective outcomes born from a lack of understanding of local conditions and culture. This increased collaboration involving multiple institutions and departments might also decrease the level of corruption as more people are involved in and keeping watch on the process. Although specific tasks and responsibilities are clearly divided in the 2013 Law of Climate Change, what is needed are renewed efforts in putting this law into practice and communicating these laws across levels of government, so that institutions at more local levels of government are involved. Information sharing mechanisms need to be improved to overcome institutional barriers and advance cross-thematic cooperation.

There is a need for the integration of climate change into education and the improvement of the population's general awareness of the causes and impacts of climate change, so they are more informed about the changes occurring around them. This would facilitate better informed bottom-up adaptation processes which are locally led and owned. This needs to be complemented by top-down leadership, where national government collects and uses taxes to provide services which improve climate resilience (Vivekananda et al., 2014b).

The current environment in which NGOs are operating in the country is not conducive to the implementation of resilience building programmes. Effort to increase the understanding of the friction and complex relationship between NGOs and the government in Guatemala is advised to add further nuances to the subject and propose concrete changes. This could serve to guide improvement of the relationship and perhaps ease NGOs' legal and administrative tasks, so

more efforts and resources can be made available for the organisations' primary purposes. This recommendation is made in the context of the current debates taking place in the Guatemalan congress around the approval of reforms to the Law of Non-Governmental Organisations for Development. These reforms would give the state the power to control, restrict and shut-down NGOs, threatening the work of environmental and human rights activists. The presence and voice of these activists and development workers is needed to ensure the government is legitimate and held to account on its duties. The risk with this NGO and government divide is that NGO interventions bypass state systems rather than working through them and strengthening governance.

It is recommended to strive for a better understanding of the conditions under which large corporations operate and the benefits and drawbacks of the economic politics and practices currently in place. This would serve as a guide to political and practical improvements in this area. This study finds that the methods used to extract resources are depleting natural reserves, which could lead to negative financial implications in the long run. Furthermore, corporations are currently operating with a large amount of leeway as to the upholding of human rights. It is suggested that an in-depth study be conducted on the specific mechanisms both through the legal system and outside of it that allows for such violations. Corruption appears to be a key factor determining the conditions under which large corporations operate and as well as a factor influencing public trust. Continuous efforts should be made to improve accountability and transparency by making use of constitutional and legal mechanisms in place in the country.

Finally, it is recommended that research be carried out on how to empower smallholder farmers, to ensure stability in people's livelihoods to allow for appropriate investments to be made without the risk of being displaced. Such efforts could impede large companies from impinging on local people's rights to land and hence food. The government should restrict investments which negatively impact local livelihoods and violent human rights, particularly the right to free, prior and informed consent, and ensure consultations are carried out systematically.

6.3.2 General recommendations

The case study demonstrates that the impact of climate change on vulnerability and thereon to a risk of violent conflict is influenced by factors such as land-use planning, resource management, risk management, livelihoods and human rights. These issues are all topics touched upon in different fields and by different actors. Greater cooperation is needed between actors from different fields and institutions, from disaster risk reduction, climate change

adaptation, peacebuilding and development to find comprehensive and integrated measures which increase resilience. Furthermore, similar conditions around LSLA, climate change and human rights violations exist in other countries. Learning from other contexts can be used to improve understanding of the dynamics taking place in Guatemala and best practices can be shaped from those.

It is also suggested that the international community and donors improve their understanding of the context and conditions before engaging in projects, to better ensure that the project is being conducted in an ethically sound manner.

6.3.3 Recommendations for future research

Further advanced work based on the results of this study is needed to inform the design of more effective policies. The evidence found in this thesis is not sufficient to provide recommendations on the policy revisions needed as the aim was geared more towards gaining an understanding of the knowledge foundation that policies should be based on. The only suggestion is that a more complex understanding of climate change adaptation in different contexts is needed, in order for policies to be tailored to the specific challenges of a particular context.

As such, it is recommended that more case studies be made on the relationship between climate change and violent conflict, to provide a larger body of evidence to support policy and programmes at a national and global level. A larger number of case studies would help find similarities and differences across contexts, which could help build best practice in the field.

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Appendices

Appendix A – Survey Questionnaire

English Version

The survey is aimed at Alta Verapaz's general population, including professionals and government officials in the fields climate change adaptation and conflict resolution.

Section 1: Demographic data

1. What is your age?
    - 18-27
    - 28-37
    - 38-47
    - 48-57
    - 58-67
    - 68-77
    - 78-above

2. What is your gender?
    - Female
    - Male
    - Other
    - I prefer not to answer

3. In what municipality do you live?

    - Chahal
    - Chisec
    - Cobán
    - Fray Bartolomé de las Casas
    - Lanquín
    - Panzós
    - Raxruha
    - San Cristóbal Verapaz
    - San Juan Chamelco
    - San Pedro Carchá
    - Santa Cruz Verapaz
    - Santa María Cahabón
    - Senahú
    - Tactic
    - Tamahú
    - Tucurú
    - Santa Catalina la Tinta

4. What is the highest level of education you have completed?

- No formal schooling
- Informal schooling only
- Some primary schooling
- Primary school completed
- Some secondary school/ high school
- Secondary school completed/high school completed
- Post-secondary qualifications, other than university e.g. a diploma or degree from polytechnic or college
- Some university
- University completed
- Post-graduate
- Refused to answer
- Don't know/ cannot say

5. What is your source of livelihood? Select all that apply
    - Livestock keeping
    - Trade in livestock and livestock goods
    - Crop Farming
    - Trade in harvested crops and agricultural goods
    - Small business owner (non-agriculture or livestock goods)
    - Tourism
    - Government employed
    - Privately employed
    - NGO employed
    - Other.

6. What ethnicity do feel most strongly connected to? *Open question*
    a. _____

7. In general, how would you describe your own present living conditions?
    - Very bad
    - Bad
    - Good
    - Very good
    - Refuse to answer
    - Don't know/cannot say

Section 2: dimensions of vulnerability to climate change

For the following questions:

- *severity* refers to degree of intensity of a given phenomenon over a particular period of time, outside of the natural range of variation

- *frequency* refers to the rate at which something occurs or is repeated over a particular period of time or in a given sample, outside of the natural range of variation*;*

- *predictability* refers to an event happening in a way or at a time that can be known of before it occurs, within a certain range of certitude.

1. In your opinion, how has the occurrence of **drought** changed over the past 15 years in terms of:
    a. Severity: A lot less / less / no change / more / a lot more
    b. Frequency: A lot less / less / no change / more / a lot more
    c. Predictability: A lot less / less / no change / more / a lot more

2. In your opinion, how has the occurrence of **intense rainfall** changed over the past 15 years in terms of:
    a. Severity: A lot less / less / no change / more / a lot more
    b. Frequency: A lot less / less / no change / more / a lot more
    c. Predictability: A lot less / less / no change / more / a lot more

3. In your opinion, how has the occurrence of **floods** changed over the past 15 years in terms of:
    a. Severity: A lot less / less / no change / more / a lot more
    b. Frequency: A lot less / less / no change / more / a lot more
    c. Predictability: A lot less / less / no change / more / a lot more

4. In your opinion, how has the **temperature** changed over the past 15 years?
    a. Average temperature: Decrease / no change / increase
    b. Temperature extremes: Decrease / no change / increase

5. How have the changes in weather (if any) affected your livelihood?
    - It has affected my livelihood positively
    - It has not affected my livelihood
    - It has affected my livelihood negatively

6. In what ways have the changes in weather affected your community? *Open question*
    a. _____

7. Do you know of any collaborative efforts from institutions to respond to the problems of these environmental changes? (multiple answers possible)
    a. Yes:
        i. State

ii. Department
iii. Municipality
iv. Local group initiatives
v. NGOs
vi. Don’t know

b. No

8. Have you had the opportunity to engage in dialogue with governance institutions to voice concerns over environmental changes?
    - Yes
    - No, but I don’t need to
    - No and I would like to
    - Don’t know

Section 3: Propensity for and causes of violent conflicts

9. How much do you agree with the following statement; 'In this area, it is sometimes necessary to use violence in support of a just cause'?
    - Strongly agree
    - Agree
    - Disagree
    - Strongly disagree

10. Is violent conflict common in your environment? (By violent conflict we mean acts involving physical bodily harm)
    - Very common
    - Common
    - Not common
    - Very rare

11. In your opinion, what are the main causes for conflict today? List and rank different causes. *Open question*

Section 4: Any additional information or comments

Spanish Version

Estimados Senores,

Somos Markus Hatting and Caroline Long, estudiantes de maestría en ‘Gestión del Riesgo de Desastres y Adaptacion al Cambio Climatico’ a la Universidad de Lund, Suecia.

Para nuestro proyecto final, estamos investigando percepciones del cambio climático, su gestión y conflictos en Alta Verapaz. Muchos estudios han tratado de demostrar que los cambios climáticos influyen en el riesgo de conflicto violento, pero esta conexión es muy compleja y aún no se entiende bien. Estamos viendo cómo la noción de "vulnerabilidad" encaja en los riesgos presentados tanto por el cambio climático como por el conflicto violento.

La encuesta consiste en preguntas de opción múltiple y preguntas abiertas.
Todas las respuestas se mantendrían estrictamente confidenciales y anónimas.

Los datos se analizarán mediante el uso de hojas de codificación para respuestas frecuentes y numeración. Los resultados se fusionarán con otros conjuntos de datos y se presentarán durante la defensa de disertación, que está abierta al público.

Participación en esta encuesta es completamente voluntaria, con la posibilidad de retirarse en cualquier momento. Si desean solicitar los resultados de este estudio o si tienen más preguntas, pueden contactarnos por ca2508lo-s@student.lu.se.

☐ **He leído esta declaración y acepto participar en la encuesta bajo las condiciones presentadas.**

Sección 1: Datos demográficos

1. ¿Qué edad tiene usted?
    - 18-27
    - 28-37
    - 38-47
    - 48-57
    - 58-67
    - 68-77
    - 78 o más

2. ¿Cuál es su género?
    - Femenino
    - Masculino
    - Otro
    - Prefiero no responder

3. ¿En cual municipio vive?
    - Chahal
    - Chisec
    - Cobán
    - Fray Bartolomé de las Casas
    - Lanquín
    - Panzós
    - Raxruha
    - San Cristóbal Verapaz
    - San Juan Chamelco
    - San Pedro Carchá
    - Santa Cruz Verapaz
    - Santa María Cahabón
    - Senahú
    - Tactic
    - Tamahú
    - Tucurú
    - Santa Catalina la Tinta

4. ¿Cuál es el nivel más alto de educación que ha completado?
    - No tiene educación formal
    - Sólo educación informal
    - Un poco de estudios primarios
    - Escuela primaria completa
    - Un poco de escuela secundaria
    - Completó la escuela secundaria
    - Titulaciones posteriores a la secundaria, que no sean la universidad, por ejemplo, un diploma o título de la escuela politécnica
    - Un poco de universidad
    - Universidad completa

- Maestria / postgrado
- No quiero responder
- No sé / no puedo decir

5. ¿Cuál es su fuente de ingreso? Seleccione todos los que apliquen
   - Ganadería
   - Comercio de ganado y productos ganaderos
   - Cultivos agrícolas
   - Comercio de productos agrícolas
   - Propietario de pequeña empresa (bienes no agrícolas o ganaderos)
   - Turismo
   - Empleado del gobierno
   - Empleado privado
   - Empleado de ONG
   - Otro

6. ¿Con qué grupo étnico se siente más identificado? *Pregunta abierta*
   - _____

7. En general, ¿cómo describiría sus condiciones de vida?
   - Muy malas
   - Malas
   - Buenas
   - Muy buenas
   - No quiero responder
   - No sé / no puedo decir

Sección 2: dimensiones de vulnerabilidad al cambio climático

En las preguntas que siguen:

- *intensidad* se refiere al grado de intensidad de un fenómeno dado durante un período de tiempo particular, fuera del rango natural de variación;

- *frecuencia* se refiere al ritmo al cual algo ocurre o se repite durante un período de tiempo particular o en una muestra dada, fuera del rango natural de variación;

- *previsibilidad* se refiere a un evento que ocurre de una manera o en un momento que se puede saber con antelación, dentro de un cierto rango de certeza.

1. En su opinión, ¿Cómo ha cambiado la ocurrencia de la **sequía** en los últimos 15 años en términos de:

	Mucho menos	Menos	Sin cambios	Más	Mucho más
Intensidad	□	□	□	□	□
Frecuencia	□	□	□	□	□
Previsibilidad	□	□	□	□	□

2. En su opinión, ¿Cómo ha cambiado la ocurrencia de **Lluvia intensa** en los últimos 15 años en términos de:

	Mucho menos	Menos	Sin cambios	Más	Mucho más
Intensidad	□	□	□	□	□
Frecuencia	□	□	□	□	□
Previsibilidad	□	□	□	□	□

3. En su opinión, ¿Cómo ha cambiado la ocurrencia de **inundaciones** en los últimos 15 años en términos de:

	Mucho menos	Menos	Sin cambios	Más	Mucho más
Intensidad	□	□	□	□	□
Frecuencia	□	□	□	□	□
Previsibilidad	□	□	□	□	□

4. En su opinión, ¿cómo ha cambiado la **temperatura** en los últimos 15 años?

	Disminución	Sin cambios	Aumento
Temperatura Promedio	□	□	□
Temperaturas Extremas	□	□	□

5. ¿Cómo se ha visto afectada su fuente de ingreso debido a cambios en el clima (si los hubo)?
    - Lo han afectado positivamente
    - No lo han afectado
    - Lo han afectado negativamente

6. ¿De qué maneras han afectado los cambios en el clima a su comunidad? *Pregunta abierta*

7. A quiènes ha afectado màs los cambios en el clima en su comunidad? *Pregunta abierta*

8. ¿Conoce alguna institución que esté realizando acciones para afrontar los problemas causados por los cambios ambientales?

1. *(múltiples respuestas posibles)*
    - Sí, de parte de:
        - Estado
        - Departamento
        - Municipalidad
        - Iniciativas de grupos locales
        - ONG
        - Sí, pero no sé de quién era
    - No

2. ¿Ha tenido la oportunidad de tener un diálogo para expresar sus preocupaciones sobre los cambios ambientales con Instituciones de gobierno u organizaciones no gubernamentales?
    - Sí
    - No, pero no lo necesito
    - No y me gustaría
    - No lo sé

Sección 3: Propensión a, y causas de, conflicto violento

1. ¿Qué tan de acuerdo está con la siguiente declaración?: 'En esta área, a veces es necesario usar la violencia en apoyo de una causa justa'.
    - Estoy muy de acuerdo
    - Estoy de acuerdo
    - No estoy de acuerdo
    - Estoy totalmente en desacuerdo

2. ¿Es común el conflicto violento en su entorno? (Por conflicto violento nos referimos a actos que involucran daño corporal físico)
    - Muy común
    - Común
    - No es común
    - Muy raro

3. Actualmente, ¿cuáles son las principales causas de conflicto? Enumere y clasifique diferentes causas. *Pregunta abierta*

    a.

    b.

    c.

Sección 4: ¿Cualquier información adicional o comentario?

Appendix B – Interview Guide

English Version

This guide is designed for interviews with members of state or local formal institutions responsible for climate change adaptation.

Introductory questions

Name, organisation, position, years in the position

Part 1 - Conceptual understandings of climate vulnerability and resilience

- How would you define vulnerability?
- How would you define resilience?
- How would you define climate change adaptation?
- Do you see a link between resilience, vulnerability and climate change? If so, how do you articulate that link?

Part 2 – Environmental changes and their impacts in the region

- What are the observed and forecasted weather changes attributed to anthropogenic climate change that your organisation works with? (increase in temperature, longer, more intense rainfalls, more hurricanes…)
    - Frequency (the rate at which something occurs or is repeated over a particular period of time or in a given sample/ events that are outside of the natural range of variation).
    - Severity (degree of intensity of a given phenomenon over a particular period of time/ events that are outside of the natural range of variation)
- In your opinion, how have these changes impacted the area? Could you give some examples?

Part 3 - Institutions, agreements and frameworks which exist to govern natural resource management and climate change adaptation

- What actions have been taken by your organisation to adapt to the changing climate?
- What assessment or frameworks do you use to guide your work or when designing programmes/policy?
- Are you collaborating with other organisations/ institutions in your work?

- To what extent do you consult with people in the area? What are your methods for doing so?
- What are the key challenges in addressing climate change?

Part 4 – Conflict sensitivity

- Are violent conflicts common in the region? Could you elaborate on the type and nature of the conflict? (*Tensions, skirmishes, open armed conflicts, etc…)*
- Do you see a link between climate change and violent conflict? If so, how do you articulate that link?
- Do you consider the risk of violent conflict when designing your programmes/ policies?
- How would you take into account the risk of conflict when designing your programmes/ policies?

Spanish Version

Introducción

Nombre, organización, posición, años en la posición.

Primera parte – conocimientos de conceptos de vulnerabilidad del clima, y resiliencia

- ¿Como definiría usted vulnerabilidad?
- ¿Como definiría usted resiliencia?
- ¿Como definiría usted adaptación al cambio climático?
- ¿Para usted existen vínculos entre vulnerabilidad, resiliencia y cambio climático? En caso afirmativo, por favor explicarlos.

Segunda parte – cambios ambientales y sus impactos en la región

- ¿Cuáles son los cambios en clima, observados y pronosticados, atribuido al cambio climático antropocéntrico, en los cuales su organización está trabajando? (ej. aumento de temperatura, lluvias más intensas, más huracanes etc.)
- ¿Existen elementos atribuidos al clima que ahora se produzcan con mayor frecuencia que antes?
- ¿Existen elementos atribuidos al clima que ahora seán más severos que antes (en períodos de tiempo, intensidad, etc.)?
- En su opinión, ¿Qué impacto ha tenido estos cambios en el área? ¿Podría dar ejemplos?

Tercera parte – instituciones, marcos de referencia que existe para la gestión de recursos naturales y la adaptación al cambio climático

- ¿Qué acciones está realizando su organización para adaptarse al cambio climático?
- ¿Realizan algún tipo de evaluaciones, diagnósticos o marcos de referencia para la construcción o diseño de programas o políticas?
- ¿Su organización trabaja en conjunto con otras organizaciones o instituciones respecto a recursos naturales o adaptación al cambio climático?
- ¿De qué manera involucran a la población en general en la creación de programas o políticas enfocadas a los recursos naturales y al cambio climático? ¿Qué métodos utilizan para dicho involucramiento?

- ¿Qué desafíos existen para abordar el cambio climático? (económicos, políticos, sociales, culturales)

Cuarto parte – sensibilidad de conflictos

- ¿Son comunes conflictos en la región? ¿Usted puede indicar que tipo de conflictos? (*Tensiones, escaramuzas, conflictos armadas etc.)*
- ¿Usted identifica vínculos entre el cambio climático y conflictos violentos? En caso afirmativo, por favor explicarlos.
- ¿Para el diseño de programas o políticas toman en cuenta los riesgos a conflictos violentos?
- ¿De qué manera manejan los riesgos de conflictos cuando diseñan programas o políticas?