

## **Armed conflicts and the management of natural disasters: toward a greater understanding of the linkages**

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### **Note to the reader**

In this work in progress, I present a tentative theoretical framework and a research design for one essay for my dissertation. I welcome all comments, but I will especially appreciate comments on the hypotheses, and the selection of cases.

### **Abstract**

In what ways may armed conflict affect vulnerability to natural disasters and undermine disaster management efforts? What are some conditions and factors which influence whether armed conflict will undermine or possibly strengthen disaster management efforts?

With mounting evidence that climate change is increasing the frequency and intensity of certain natural hazards, some researchers have suggested that natural disasters could increase armed conflict. Others have claimed that natural disasters could create an opportunity to make peace. However, very few scholars and policy makers have examined the possible effects of armed conflict on natural disasters management. So far, disaster risk reduction and management approaches have been developed in secure contexts, where operational and institutional challenges resulting from armed conflict and post-conflict situations have not been properly taken into account.

A better systematic understanding of how armed conflict matters -- i.e., the mechanisms by which armed conflict may increase vulnerability to natural disasters and undermine disaster management efforts - is needed. Drawing on the peace and conflict literature, this paper suggests that armed conflict affects vulnerability and therefore disaster management in four possible ways: (1) by reducing and diverting resources away from disaster reduction and management, (2) by limiting the access to victims, (3) by destroying communication between the central government, the local authorities and the population, and (4) by damaging social capital and cooperation among the society. Comparing different level of intensity of armed violence between two departments in Colombia both affected by the 2010 floods will help us to understand more precisely the impact of violence on disaster response.

This article provides some of the first systematic research on the impact of armed conflict on natural disaster management. Therefore, this study may contribute to informing governments about the extra challenges of managing disasters in countries stricken by armed conflicts.

## 1. Introduction

There is now stronger evidence that climate change is increasing the intensity and frequency of natural disasters, particularly the hydrological and climatological ones, such as heavy precipitations, cyclones, and drought (IPCC, 2011). During the year of 2010, 385 natural disasters killed around 300 000 people worldwide, mainly in the developing world (EM-DAT, 2010). Hence, examining the context where these natural disasters take place is even more needed. Even without taking into consideration climate change and its potential to increase natural hazards, disasters impacts will continue to rise in many countries given the increase of vulnerable people and unsustainable assets, mainly badly plan urbanization in developing countries. The character and severity of the impacts of climate extremes depend not only on the extremes themselves but also on exposure and vulnerability (IPCC, 2011).

At the same time, armed conflicts keep affecting many communities and countries throughout the world. For the year 2010, 30 active armed conflicts have been recorded by the UCDP, and among them four caused more than 1000-battle related deaths, i.e. Iraq, Afghanistan, Pakistan and Somalia. The majority of the on-going conflicts are internal with high civilian casualties (UCDP, 2011). The World Development Report 2011 claims that more than 1, 5 billion people live in countries stricken by armed conflict.

Looking at the top ten countries affected by disasters in term of casualties for the year 2010, half of them have experienced or still experience an armed conflict (See Appendix 1). The first of this country is Haiti with a dead toll of 222 641 (EM-DAT, 2010). This might not be a coincidence; even though geographic, physical, and economic factors features are obviously important in explaining the impact of natural hazards.

Currently, very few scholars and policy makers have looked at the effects of armed conflict on people's vulnerability to natural hazards. To a large extent this could be explained by the fact that armed conflict encompasses some of the factors behind vulnerability to natural disasters. Indeed, there are numerous overlaps between conflict and natural disasters which make any analysis somehow difficult to undertake. For example, it is well established that poverty, inequality and weak state's institutions increase the risk of armed conflict as they also increase vulnerability to natural disasters. The disasters study literature has been ill-equipped to isolate specific factors related to armed conflict with those related to general underdevelopment. By unpacking armed conflict and examine how armed violence matters for natural disasters response at a local level, this article will shed light on the mechanisms by which conflict influences natural disasters response.

This paper is an attempt to look at the factors within an armed conflict that affect natural disaster response, by answering the following question: under which conditions armed conflict undermine disaster response? It is suggested in the light of the literature that armed conflict *negatively* affects vulnerability and therefore disaster management in four possible ways, (1) by reducing and diverting resources away from disaster reduction and management, (2) by limiting the access to victims and (3) by destroying communication between the central government, the local authorities and the population and (4) by damaging social capital and cooperation among the society.

The question of the effect of armed conflict on developmental issues such as disaster risk reduction is of high policy relevance as shown by the 2011 World Development Report on the burden of armed conflict for development.

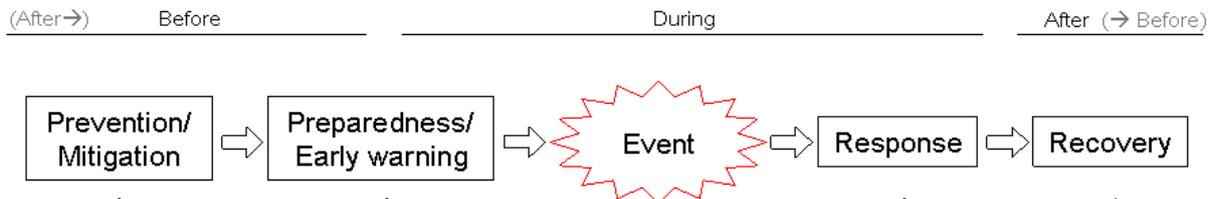
This paper consists of several parts. First, it provides the reader with some definitions and conceptualisations and examines the existing literature on conflict and natural disasters highlighting some caveats. Second, the general approach and the hypothesis are presented in the context of the existing literature. Third, a comparative within-case study on two departments in Colombia will be used to reveal in what ways armed violence matters for natural disasters management.

### *1.1 The concept of natural disaster and natural disasters management*

A natural disaster is an event that causes serious disruption of the functioning of a society. A natural disaster is a multidimensional event that can be broken into three elements: the natural hazard, the exposure and the vulnerability (Wisner et al. 2005, Birkmann 2006). Hence, the extent to which a natural hazard will become a disaster depends on these three elements. While a serious natural hazard will become a natural disaster in any case, an average or small natural hazard might not provoke a natural disaster if the exposure and the vulnerability of the society is low. Although the concept of vulnerability is much debated (Adger, 2006), vulnerability to natural disasters could be defined as the set of characteristics of a society in terms of their capacity to anticipate, cope with, resist and recover from the impact of natural hazards, (Wisner et al. 2005).

Natural disaster management consists of four components: mitigation/prevention, preparedness, response and recovery that are all intertwined and performed before, during and after the disaster (Coppola, 2010). The current trend today in disaster management is to focus on the disaster reduction part as a way to mitigate the effect of natural hazards. The focus in disaster management has shifted from a mostly responsive activity to a preventive one. This focus on the pre-disaster phase is at the core of the UN mechanism for disaster reduction (UNISDR) and the Hyogo Framework

for Action 2005-2015 : Building the resilience of nations and communities to disasters (HFA). The HFA, adopted by 168 governments, is the leading framework for guidance in disaster risk reduction.



**Figure 1. Different phases of disaster management**

Aware of the fact that armed conflict affects all phases of the disaster management, this article will mainly focus on the response and recovery phases as they are more easily measurable. However, all the phases are interlinked; good prevention policies will improve the response for example. In addition to be the most visible part of disaster management, I argue that in many developing countries where there is limited investment in prevention, the response phase is the most important one as it reduces the casualties and ease the suffering, if relatively effective.

However, what makes an effective response?

To be able to measure the impact of armed violence on disasters response, it is essential to define what an effective response is. Disaster response is of course very tricky to measure as it depends of the intensity and severity of the hazards and the exposure, there is no threshold or international data that measure the effectiveness of disaster response. The response phase consists of “actions aimed at limiting injuries, loss of life, and damage to property and the environment that are taken prior to, during, and immediately after a hazard event” (Coppola, 2011: 251). The speed of the response seems to be a central factor for its effectiveness as any delay will translate into more casualties. Adequate information and coordination between the actors involved are essential for a quick and effective response. Good operations and communications mechanisms between all provinces and districts, and established systems of coordination between international organization and national responders increase the speed of the response (Katoch, 2006). When the disaster is taking place, the first and obvious priority is to save lives. This includes search and rescue, first aid, and evacuation. Depending on the type of disasters and on its severity, this phase can be short or long. There are additional functions to be added to the list of emergency response, such as:

- Providing water and food
- Shelter,
- Fatality management
- Sanitation

- Security
- Social services
- Resumption of critical infrastructure (Coppola, 2011: 251).

This typology based on the work of Coppola will serve as a tool to assess the effectiveness of the response.

## 2. What is known about conflict and natural disasters?

The current literature on natural disasters and armed conflict has mostly examined how natural shocks could increase the risk of conflict, or on the contrary, nurture peace. However, very few authors have reversed the causal link and studied the other side of the spectrum that is, *how armed conflicts affect disaster management*.

### 2.1 Natural disaster as increasing the risk of armed conflict

The fact that natural disasters increase frustration and unrest is not a new idea. Connections between natural disasters and violence have been suggested in light of different cases.<sup>1</sup>

The first serious research on this topic started with Homer-Dixon in the early 1990s, focusing on how environmental change could play a variety of roles as a cause of conflict. Six types of environmental change has been examined, climate change, ozone layer depletion, degradation of agricultural lands, deforestation, deterioration of water resources, and depletion of fish stocks. Scarcities of important resources are at the center of Homer-Dixon's theory. He argues that scarcities are caused by environmental change, population growth and unequal distribution. This increased lack of resources is likely to lead to social and economic problems, and these may then create conflict or fuel existing ones. Land degradation could trigger migration, which could provoke ethnic conflict as migrants clash with indigenous populations. These above mentioned environmental change by decreasing agriculture outputs are likely to increase frustration-aggression behaviors, massive immigration, and could disrupt institutions and social relation. Intrastate conflict over natural resources (especially water), uprisings, group-identity conflict, and even civil wars could break out as a result of these environmental effects, coupled with slow economy, social problems such as inequality, and weak state institutions (Homer-Dixon, 1991, 1999) . Homer-Dixon uses a number of case studies to defend his argument, but in a rather anecdotal manner.

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<sup>1</sup> For example, in 1970, a devastating typhoon hit Bangladesh which was part of Pakistan at that time. The apparent indifference of central political leaders and the massive wave of refugees into India eventually triggered the civil war in Pakistan and led to Bangladesh's independence. The 1972 earthquake in Nicaragua is also considered as having triggered revolutionary movements later on.

In 1998, Drury and Olson developed various hypothesis regarding disasters and political unrest, rather similar to Homer-Dixon's hypotheses. They argue that disaster creates resource scarcities and dis-organized the government, making it more vulnerable to unrest, especially in a country with pre-disasters existing tensions. They test statistically their causal model using a time series non-linear regression. If their hypotheses seem to be confirmed by their test, the authors do not control for other variables that could affect the result of their regression, such as democracy and the existence of conflict, which might be problematic as the major disasters selected in their study include some countries affected by conflict. "Political Unrest" is conceptually underdeveloped in their analysis, it is unclear for example if social unrest is violent or not, and if armed conflict is part of political unrest.

More recently and in a similar vein, Bhavnani, Brancati, Nel & Righarts and Nelson have again argued that natural disasters or environmental shocks can create scarcities of important resources, frustration, insecurity, poverty, marginalization and some authors have suggested that these external shocks could trigger conflicts (Bhavnani, 2006; Brancati, 2007; Nel & Righarts, 2008; Nelson, 2010). Brancati claims that earthquake increases the risk of violent conflict by producing scarcities in basic resources, especially in countries where the competition for scarce resource is already tense. It is argued that the mechanisms that connect them to an increased risk of conflict can be relevant for any type of rapid-onset disaster, whether climatic, seismic or hydrological. She tested her hypotheses through a statistical analysis of 185 countries from 1975 to 2002 and found a strong relation, especially for low-level violence. Although she argues that earthquake can stimulate intrastate conflict by producing scarcities, there is actually no variable measuring this in her statistical model (Slettebak, 2012). Drawing conclusions about causal relation with such a weak basis is problematic. Nel and Righarts have equally found a positive relationship between natural disasters and the risk of armed conflict, using a more robust statistical analysis in terms of control variables, larger sample sizes and longer time periods. Their model has been criticized by Slettebak who argues that population size was not well controlled by the model, although essential as the effect of disasters on conflict risk could be confounded with the effect of population size (Slettebak, 2012: 197). The positive relation between natural disaster and the risk of armed conflict seem to be overestimated. Most of the criticism against natural disasters increasing the risk of armed conflict has come from PRIO. The so-called "Oslo group" led by Gleditsch countered the excessive use of case studies and undertook a more quantitative approach to test Homer-Dixon theory. He criticized Homer-Dixon for his tendency to only choose case studies with acute conflicts over resources and neglect to mention counter examples (Gleditsch, 1998). In other words, all of Homer-Dixon case studies have been selected according to both independent and dependent variable, which create strong bias (KKV). In addition, the causal effect of an explanatory variable that does not vary cannot really be assessed.

On the contrary, researchers at PRIO argues that abundance of resources is more likely to lead to violence as rebel groups, among other reasons, can fund themselves from the exploitation of natural resources. In sum, if environmental change could play a limited role in explaining conflict, crucial explanations for the outbreak and intensity of armed conflicts still lie in economic, political and social factors (Gleditsch, 1998, Salehyan 2008, Theisen, Holtermann, Buhaug, 2011, Gleditsch 2012).

In a special issue of the *Journal of Peace Research* in 2012, Slettebak draws from his criticisms on Nel & Righarts model to propose a new statistical analysis of the relation between natural disasters and armed conflict. His study has been so far the most robust attempt to quantitatively assess the link between natural disasters and armed conflicts. According to his results “disasters do not raise the risk of conflict; on the contrary, they appear to lower it”. It seems that the determinant factors whether natural disaster will trigger conflict lies in the usual conflict-promoting factors, mainly poor governance and poverty. He argues that “there is a risk of misguided policy to prevent civil conflict if the assumption that disasters have a significant effect on war is allowed to overshadow more important causes” (Slettebak, 2012).

Although there is a widespread consensus that natural disasters cause a legion of social, political and economic problems, whether it creates conflict or not is more debated. The literature and the debate around the effect of environmental shocks have been prolific and a consensus seems to have been reached regarding its very limited impact on conflict dynamics.

At the same time, the literature on natural disasters and conflict simultaneously suggest that natural disaster could also create peace.

### *2.2 Natural disaster as a conflict resolution opportunity*

On the other side of the debate, there are equally some scholars that argue that natural disasters could create windows of opportunity for peace. Although “disaster diplomacy” is not a prominent factor in conflict resolution, disaster-related activities often influence peace processes in the short-term—over weeks and months—provided that a non-disaster-related basis already existed for the reconciliation. That could be secret negotiations between the warring parties or strong trade or cultural links. Over the long-term, disaster-related influences disappear, succumbing to factors such as a leadership change, the usual patterns of political enmity, or belief that an historical grievance should take precedence over disaster-related bonds (Kelman, 2011). The ‘disaster diplomacy school’ have used a wide variety of case studies to demonstrate that disaster relief could influence peace process in the short term by increasing for example the onset of negotiation and informal talks between the warring parties (Kelman & Koukis, 2000; Ker-Lindsay, 2000; Holloway, 2000;Kelman,

2006; Kelman, 2011). This hypothesis is also very frequently relayed by the media (Courrier International, 2011). Akcinaroglu and DiCicco conclude in the same line that earthquakes “can promote rapprochement, political steps toward warmer relations that makes it difficult for interstate rivalry to continue”. However, they argue that using a comparative case study that communal violence matters for understanding divergent outcomes between different countries (Akcinaroglu and DiCicco, 2011).

However, the “disaster diplomacy School”, only based their hypothesis on case studies and have lacked to include any systematic statistical analysis. Filling this gap, Kreutz provides a statistical analysis of the occurrence of new negotiations, ceasefires, and peace agreements, and he found that “natural disasters increases the likelihood that parties will agree to ceasefires, but have less effect on the onset of talks or the signing of peace agreement” (Kreutz, forthcoming 2012). His conclusion goes in line with the disaster diplomacy school as ceasefires can influence peace process in the short term but are less likely to last than victories or proper peace agreement.

### *2.3 The impact of conflict on natural disasters management*

The current literature on natural disasters and armed conflict has mostly examined how natural shocks could increase the risk of conflict, or on the contrary, nurture peace. However, very few authors have reversed the causal link and studied the other side of the spectrum that is, how armed conflicts affect disaster management. Natural disaster researchers have touched upon the topic (Wisner et al, 2004), but in an intuitive and rather shallow manner, and from a peace and conflict research perspective, it seems that so far no one has examined this particular link. It is only recently that peace researchers have started to properly study the aftereffect of conflict on the society. The groundbreaking work of Ghobarah, Huth and Russett on the impact of war on public health (2003) has been the first systematic study on the consequence of war on civilian population and institutions after the period of active armed conflict. Drawing from different set of literature, mainly public health and disaster studies, the next section will attempt to draw some relevant hypotheses regarding the impact of armed conflict on natural disaster management.

### 3. Analytical framework

In order to develop hypotheses about the effects of civil war on natural disaster management, I draw from an analytical framework on the general consequences of civil war.

In their path-breaking book on natural disasters, Wisner et al. (2005) showed how conflict have continued to exacerbate natural extreme events, by increasing the vulnerability of societies to natural disasters. They especially examined how drought and famine were related to armed conflict (Wisner et al, 2005). They argue that conflict interacts with natural hazards in a wide range of ways:

- Armed conflict is one of the main causes of social vulnerability
- Armed conflict is one of the main causes of institutional weakness
- Conflict trigger displacement of large numbers of people in war and other violent conflict can lead to new risks (exposure to disease, unfamiliar hazards in new rural or urban environments)
- Violent conflict can interfere with the provision of relief and recovery assistance
- Participatory methods meant to empower and engage socially vulnerable groups may be difficult or impossible during violent conflicts.
- The application of existing knowledge for the mitigation of risk from extreme natural events is often difficult or impossible during violent conflict
- Violent conflict often diverts national and international financial and human resources that could be used for the mitigation of risk away from extreme natural events
- Conflict sometimes destroys infrastructures, which may intensify natural hazards (e.g. irrigation systems, dam, levees) or compromises warnings and evacuation (e.g. land mines on roads).
- Violent confrontations often wreak havoc on vegetation, land and water, and this undermines sustainable development. (Wisner et al. 2005)

Ben Wisner (2005, 2009, 2012) has provided the first attempt to understand how armed conflict affects natural disasters. “There are many ways violent conflict complicates, confuses and obstructs the efforts of planners, engineers, and other to assist people in protecting themselves, their livelihoods, and their built environments from natural hazards” (Wisner, 2012:71). These negative impacts in turn exacerbate violent conflict, creating a vicious circle of vulnerability and underdevelopment.

To back his hypotheses, Wisner uses anecdotal evidence and NGOs reports that do not always respond to scientific standards. His analysis is rather intuitive and descriptive; while some ideas

about the causal mechanisms between armed conflict and disasters are proposed, they still need to be refined, and theoretically and empirically examined and eventually tested. This is one of the main objectives of this article.

A main criticism toward disaster studies is that violent conflict is neither defined nor unpacked. How conflicts matter and by which mechanism they affect the response needs further research. All conflicts are not alike. There is equally some confusion between underdevelopment factors and armed conflict factors.

While it is rather intuitive that armed conflict impact *negatively* natural disaster management, one could also ask if, under certain circumstance, armed conflict may not improve the rapidity of the relief due to high militarization. Indeed, the military has always acted as first-responders in natural disaster management and might be already deployed when a disaster strikes. It is also important to look at the transformation that occurs during the conflict that potentially could improve disasters management. For example, previous experience of deadly natural disasters might induce the improvement of disaster management mechanisms and institutions, even though the country remains affected by an armed conflict.

### 3.1 Unpacking armed conflict

The current literature on natural disasters has overlooked the specificities of armed conflict. Theorizing and describing conflict is crucial as not all forms of conflict will have the same influence on the society in general, and on disaster reduction in particular. The intensity, duration and geographical scope of violence are important to assess in order to provide an accurate impact of armed conflict on natural disaster management. In addition, the pre-war situation needs to be equally studied given that certain determinant factors not directly related to armed conflict could also impact natural disaster management. To paraphrase von Clausewitz, “War ... is a true chameleon... because it changes its nature a little in each concrete manifestation.” Armed conflict includes different types of circumstances and realities that are likely to impact disaster response in different ways. It seems for the sake of this research that it is more useful to think in terms of duration, scope, intensity and actors of the conflict. “More subtle classifications of violence may make for a richer analysis of the linkages between development and violence than can be generated by exclusive focus on one, awkward category such as ‘civil war’” (Cramer, 2006:86). In addition, an array of countries that are officially at peace are still affected by extreme forms of violence. Examples of such a countries include Guatemala, El Salvador, and Venezuela (Geneva Call, 2011). In that sense, post-conflict violence may affect natural disasters response in a similar manner than conflict-stricken

countries. A common pattern in many modern wars is that they do not have clear-cut beginnings and ends in terms of violence continuation (Cramer, 2006).

Coming back to the classics, Galtung views violence as a broad phenomenon --“Structural violence” -- that includes inequality, injustice and exploitation. While the concept violence can be stretched beyond physical violence, this paper will narrow down to physical violence i.e. homicide and violent deaths, although acknowledging that structural violence has great importance to understand vulnerability.

This paper will focus on the effect of armed violence, according to its scope, duration, intensity as it is assumed that it is likely to affect the dependent variable, disaster response. Violence will be viewed as a process and will be studied at the local level, due to great variation of conflict level within a country. It is argued that armed conflict can be characterized along four dimensions: duration, intensity, scope and actors (Davenport, ??). These four dimensions are very likely to have different effects on population behavior, resources and interactions and in turn impact disaster response. Conflicts of longer duration are likely to have more effect on the population behaviors and on the state institutions by straining its resources, than short-lived conflict.

Different levels of intensity of violence will equally impact the society and the state in different ways. High intensity of violence is very likely to disrupt basic service and critical infrastructure, severely impacting disaster response. During an armed conflict, some areas might be more affected than others and variation over time might equally occur. This leads us to a third dimension, geographical scope of violence. An armed conflict can affect the whole country or be more dispersed, only affecting some remote rural regions.

Finally armed conflict actors and motivation as well as ambitions might impact disaster response in different way. “Political actors use violence to achieve multiple, overlapping and sometimes mutually contradictory goals” (Kalyvas, 2006:23). An armed group that sees itself as an alternative to a the current government might be more prone to get involve in disaster response as a way to “win heart and minds”, for example.

### 3.2 Drawing hypotheses

While all governments have to prioritize their spending, it is claimed that government spend less on disaster prevention in politically weak or hostile regions (Cohen and Werker 2008). It is rather well established that civil war reduces economic growth (Collier 2003). Engaging in conflict, both international and domestic, taxes country’s national resources, often pulling money and energy from domestic social services. This is the idea of “development in reverse” developed mainly by Collier

(2003). In turn, a staggering economic reduces the amount of taxes revenue that the state could use to finance health care and other public policies such as disaster reduction. Furthermore, civil war reduces the efficient use of resources that are allocated to public health. “Wartime destruction and disruption of the transportation infrastructure (roads, bridges, railroad systems; communication and electricity) weakens the ability to distribute clean water, food, medicine, and relief supplies, both to refugees and to others who stay in place” (Ghobarah et al., 2003:193). The state and the society divert an important part of its resources from productive activities to armed violence, therefore causing a loss from what the resources were previously contributing and a loss from the damage resulting from this violence (Collier et al, 2003; Lautze 2006). Armed conflict destroys the human and infrastructure capital, by damaging hospital and clinics and by provoking the flight of public health professionals (Ghobarah et al., 2003; Iqbal, 2006). During and after a civil war, there is a myriad of pressing issues that require money from the public resources, including economic reconstruction, disarmament, demobilization and reinsertion of combatants, security sector reform, among others. Trade-off between military/security sectors and other public sectors are to be found in war or post-war context. Similar conclusions have been drawn by Davenport on his report on the effect of armed conflict on the spread of HIV/AIDS, where he argues that one of the most important casual links between these two scourges is “the reduction of resources away from public health/social services and towards more pressing security needs” (Davenport and Loyle, 2009:13). Usually this diversion of resources away from public health often comes with a decrease in infrastructure further limiting the capacity the management of public health issues (Iqbal, 2006).

As a result, this leads to a decrease in other public expenditures such as those on infrastructures and health, albeit essential for effective disaster reduction and management. In a similar vein, Wisner et al. also (2005) argues that violent conflict often diverts national and international financial and human resources that could be used for the mitigation of risk away from extreme natural events.

The application of existing knowledge for the mitigation of risk from extreme natural events is often difficult or impossible during violent conflict. For example, some natural disasters preparedness mechanisms, such as drought early warning are neglected in times of war (Wisner, 2009). Most of the time in armed conflict and post-conflict situation, natural disasters management is not part of the agenda. While the mains actors in the management of the disaster are central and local governments, they are very likely to be destroyed or lacking resources.

From this discussion, we draw the following first hypothesis:

*H1: Armed conflict reduces and diverts resources away from disaster reduction and management and makes these limited resources less effective*

In a context of armed conflict, access to certain places are limited due to security issues, which restricts the ability of the international relief organizations and government agencies to have access to disaster-affected population (Wisner, 2009). In this environment, relief workers have to negotiate with the military or with the insurgents groups to get access to some places. In complex emergencies planning is much trickier as it requires more resources that, most of the time, are no sufficient ( O'Brien et al. 2006). Physical insecurity is prevalent in such a context and complicates any disaster relief activities. Physical insecurity comprises major security incidents affecting national or international staff, defined as killings, kidnaps, physical attacks and abductions. (ODI 2005).

This suggests a second hypothesis:

*H2 Armed conflict slows and limits the access to disasters victims*

Preparedness system for natural disasters relies on effective communication between the central state, local authorities and the population (Coombs, Holladays, 2010, T'hart, and Boin, 2010). It is essential for disaster management to include various agencies and sectors at different level of government and to make sure that collaboration between these different levels are undertaken. The key to understanding disaster management lies in the nature of relationships between different levels of government (Wilkinson 2012). Coordination is crucial for effective disaster management as governments operate across subnational or international boundaries and different authorities. For example, managing floods requires linkages between various sectors, such as water and sanitation authorities, environmental agencies, land users, community groups, planning departments and the emergency services (Williams, 2011). Even in developed and peaceful countries, communication tends to break down due to a lack of preexisting communication channels between different levels of command or different agencies and authorities (Boin, 't Hart, 2010). However, armed conflict disrupts the communication necessary to effectively warn or manage the disasters. Meteorological knowledge and early warning are often not communicated to conflict zones (Wisner, 2009: 251).

From this discussion, a third hypothesis can be drawn:

*H3 Armed conflict damage communication and coordination between the central government, the local authorities and the population*

The role of local populations in times of natural disasters is essential as they are the first affected and can only rely, at the beginning of the disasters before the arrival of the relief workers, on their own local network and local governments. Therefore the role of the local capabilities and collaboration among the society at the local level is extremely important (Wisner, 2009:250). But amidst armed violence, especially different ethnic groups, people are less likely to collaborate and trust each other.

Social capital – the features of social organization, such as trust, norms and network that can improve the efficiency of society by facilitating coordinated actions (Putman, 1993:167) – can be damaged by armed violence and undermine social cohesion and lead to less collaboration among the society (Cox, 2009, **others?**). Violence not only affects physical infrastructure but also the glue that hold society together, which enables social relations and networks to function (Alutze 2006). However, this assumption has been nuanced by some scholars that have demonstrated that social cohesion within the same group can be increase in time of conflict or natural disasters. (Goodhand et al, 2000). If armed conflicts seem to undermine disaster prevention and preparedness by eroding the trust between citizens and their government, and have enduring effects on the vulnerability of politically marginalized groups (Le Billon, 2007:412), the effect of natural disasters and conflict on social cohesion within groups are very often reinforced. In addition, participatory methods meant to empower and engage socially vulnerable groups may be difficult or impossible during violent conflicts (Wisner, 2009).

The research reviewed above suggests a last hypothesis:

*H6 Armed conflict damages social capital and cooperation between different groups*

#### **4. Armed conflict and floods in the Department of Cauca and Cordoba in Colombia**

The above-mentioned hypotheses have been drawn from a various sets of literature that have tried to examine how armed violence affects societies. These assumptions will be tested by looking how different levels of violence impact the dependent variable, i.e., disaster response. This will test two arguments in the current literature. First, the argument that armed conflicts in general undermine disaster management without any within-country variation. Second, it will test to what extent the hypotheses are affected by different level of violence, under what conditions armed conflict undermine disaster response. The empirics will consist of semi-structures interview with key informants, complemented with secondary sources.

A structured focused comparison (George & Bennett, 2005) between two departments in Colombia that have been equally affected by the 2011 floods, but experiencing different level of violence, will help to test my hypothesis at a local level and hopefully “fill a space” in the current and scarce literature on the impact of armed conflict on disaster management. The research design is trying to involve two cases that are “most similar”, which are cases that are comparable in all respects except for the independent variable (George & Bennett, 2005: 81), in this case the level of violence varies across the two cases. In addition, process-tracing will be used to make the comparison more robust

by helping to evaluate how different variable from those of interest might account for differences in outcomes (George & Bennett, 2005: 81).

Through its history Colombia has been affected by protracted armed conflict and by numerous natural disasters. The 1985 Nevado del Ruiz eruption that cost the lives of nearly 22.000 people made the international headlines (EM-DAT 2010). Interestingly, according to the reports from that time the high loss of life could have been avoided as science accurately foresaw the hazards but the Colombia government was slow to react (Voight, 1990). Ten years later Colombia was affected again by an earthquake in the Eje Cafetero region that killed 1186 people.

Although Colombia is extremely exposed to all type of natural hazards, such as earthquake, volcanic eruption, drought and floods, I have decided to examine only floods as they are expected to increase in the future due to climate change (IPCC, 2012). While these two earthquake are the most deadly disasters, the 2010 floods<sup>2</sup> affected 2,2 million people across the country and killed more than 500 people, and the damage amount for 1 billion USD<sup>3</sup>(EM-DAT, 2011). The majority of the departments were flooded and the President Manuel Santos declared the state of emergency. Considered as the worst natural disaster that affected Colombia, these heavy precipitations have been related to the effect of La Niña, part of the broader El Niño Southern Oscillation climate pattern or ENSO, an climate oscillation very likely to be affected by climate change (IPPC, 2003).

Both the Department of Cordoba and Cauca have been affected by the 2010 floods. Similar in terms of population and economic development (DANE, 2010), both departments have recorded more than 200 000 people affected by the floods<sup>4</sup>. The Department of Cauca is however more affected by the conflict as more than 40 incidents of armed hostilities have been recorded for the year 2010, compared to 22 for Cordoba (OCHA, 2011). In what ways and under which conditions armed conflict undermine disaster response? How may different levels of violence impact disaster response? These questions will try to be answered through a structured focused comparison.

## 5. Discussion and results

Field study in these two departments in 2013.

## 6. Conclusion

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<sup>2</sup> The floods have continued in 2011 and still today.

<sup>3</sup> Just for the Flood in April 2010 (EM-DAT, 2011)

<sup>4</sup> Cauca:207 000, Cordoba:201 000 (SNAP, 2010)

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**Figure 1 Number of deaths from natural disasters and situation of armed conflict**

<b>Top ten countries in term of disasters mortality</b>	<b>Main type of disasters</b>	<b>Number of deaths</b>	<b>Presence of an armed conflict (UCDP)</b>	<b>Post conflict situation</b>
<b>Haiti</b>	Earthquake	222 641	NO	YES
<b>Russia</b>	Climatological (heat wave and fires)	55 844	YES	NO
<b>China</b>	Hydrological and Geophysical (earthquakes and floods)	7186	NO	NO
<b>Pakistan</b>	Hydrological (floods)	2186	YES	NO
<b>India</b>	Hydrological, climatological (floods and droughts)	1405	YES	NO
<b>Indonesia</b>	Geophysical and Hydrological (volcanoes eruptions and floods)	1294	NO	YES
<b>Chile</b>	Geophysical (earthquake)	562	NO	NO
<b>Colombia</b>	Hydrological (floods)	528	YES	NO
<b>Peru</b>	Climatological and hydrological (drought and floods)	497	YES	NO
<b>Uganda</b>	Hydrological (floods)	388	YES	NO

Source: EM-DAT 2011; UCDP 2011.