



Environmental impacts and causes of conflict in the Horn of Africa: A review

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ABSTRACT

The Horn of Africa region stands out amongst the planet's territories that are most volatile and vulnerable to armed violence. Conflicts have greatly affected the region over the past 50 years. The conflicts have disrupted the lives of people as well as the environment in ways that are not fully understood. Although armed conflict has generally had a negative impact on the environment, the environmental impact of conflict within the Horn of Africa has barely been evaluated. Similarly, our understanding that climate variability as well as change could have played a role in increasing or decreasing the impacts of conflicts within the Horn of Africa is insufficient. Therefore, this paper looks at the environmental impacts of conflict in the Horn of Africa since 1970 and also the role of climate variability in increasing or decreasing the impacts of conflict. Scientific publications as well as grey literature were reviewed with the aim to understand the status of past and present conflicts in the Horn of Africa, environmental impacts of conflict and the role of climate variability in decreasing or increasing impacts of conflict. The review demonstrates that conflict has extensive negative impacts on the environment in the Horn of Africa with main causes like grievances, government behaviour and interests, resource scarcity and trans-border conflict as well as internal migration and climate variability. Similarly, climate variability plays a great role in exacerbating the impacts of conflict in the region. However, further research is needed to clearly show the impact of conflict and climate variability on the environment in the Horn of Africa.

1. Introduction

The historical backdrop of Africa as a landmass has always been a hot debate (Aladi, 2002). The Horn of Africa area is a champion among the most temperamental and battle-slanted territories on the planet (Tadesse, 2003). Conflict and instability trends in the Horn of Africa keep on making it a standout among the most unsteady areas on the planet (USAID, 2012; Fulgence, 2015). The civil war in Sudan and clan violence in Somalia are only a part of the on-going conflicts (Guha-Sapir and Ratnayake, 2009).

Africa's remarkable size and diversity make it hard to speculate on conflict and instability, especially in the Horn (USAID, 2012). Each case has its own particular progression, drivers and routes; every group distressed by clashes has its own novel arrangement of adjustments and levels of versatility (Aremu, 2010; USAID, 2012). There is no viable alternative to consider specific and relevant information about each

instance of contention and shakiness. The reasons for these contentions are ingrained and occurred over a long period of time (Tadesse, 2003; USAID, 2014).

The perpetual political pressures, wars and conflicts in the region have had a negative effect on economic advancement (Conteh, 1998). The immediate impacts of armed conflict on civilians are surely known and have been broadly chronicled (Ismael, 2007; Sidel and Levy, 2008; Tardanico, 2008; Li and Fang, 2016). The aberrant impacts of armed conflict in the light of the using weapons on a country's property, air and water can moreover have unfriendly, long term and far reaching effects on human populations (Joksimovich, 2000). A few studies have reasoned that armed conflict has been hurtful to biodiversity and creatures due to habitat destruction and fragmentation, over-misuse and corruption of regular assets, and incrementally pollutes land and water (Baral and Heinen, 2005; Eniang et al., 2007; Messina and Delamater, 2006). On the one hand, the environmental impact of

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conflict in the Horn of Africa is scarcely evaluated, and on the other hand, our understanding of how climate variability could have played a part in expanding or diminishing the effects of conflicts in the Horn of Africa is not yet notable. This understanding is critical for conflict prediction and management, climate change adaptation as well as biodiversity and ecosystem preservation in the Horn of Africa. Thus, the target of this paper is to review environmental impacts of conflicts in the Horn of Africa and to review the role of climate variability in increasing or decreasing conflicts.

The review paper starts by defining conflict and its general causes followed by its impact on the environmental issues including forest cover, biodiversity and wildlife, soil, water, and air pollution and also discusses different aspects of the environment. The role of climate variability on conflict is summarized independently. The methods used to collect the information to develop the review paper are given in section 5. The resulting effects of conflict on the environment and their cause in the Horn of Africa are presented and discussed in section 6. The paper concludes with reflections in section 7.

1.1. Definition and causes of conflict

The literature review shows that the meaning of conflict has been characterized differently by researchers. For this paper, four general classifications of conflict strictly related to the study have been distinguished including internal conflict, international conflict, non-state conflict and extra-state conflict. Traditionally, conflict is thought to emerge from contradicting interests including scarce resources, dissimilar objectives and dissatisfaction (Schmidt and Kochan, 1972). Barki and Hartwick (2004) characterizes conflict as a dynamic process that happens between interdependent parties as they experience negative responses to perceived contradictions and obstruction in the accomplishment of their goals. Conflicts could be violent, uncontrollable, escalating and insolvable or latent and resolvable (Ajayi and Buhari, 2014).

For this paper, four general classifications of conflict have been distinguished. Internal conflict (or intrastate conflict) is one in which the number of legislative specialists of a state is restricted by using arms to oust experts (Eminue, 2004). Then, international conflict or interstate clashes again occur between at least two countries and include the political powers of more than one state (Puchala, 1971). Non-state conflict is the utilization of military force between two composed gatherings, neither of which is the legislature of the state. Extra-state conflict happens between a state individual from the worldwide framework and a political unit outside of its regional limits (Kudakwashe and Richard, 2015).

In Africa, the four different conflict types have occurred in varying degrees from place to place. Conflicts in Africa seem to have been brought about by a variety of variables, for example, resource scarcity, arbitrary borders made by the pioneer powers, heterogeneous ethnic compositions of African states, uncouth political initiatives, corruption and negative effects of the burden of obligation outside and poverty (Aremu, 2010).

1.2. Impact of conflict on environment: global perspective

The environmental effects of conflict are generally categorized as direct or indirect (Jha, 2014). Direct impacts relate to those whose occurrence may be physically linked to military action and which typically arise within the immediate short-term, whereas indirect impacts are those that can be reliably attributed to the conflict but they usually tangle with many factors and only fully manifest themselves in the medium to longer term (Partow, 2008). Some examples of direct impacts include deliberate natural resource destruction, environmental contamination from bombing of industrial sites, and military debris and demolition waste from targeted infrastructure. On the other hand indirect impacts include the environmental footprint of displaced

populations, collapse of environmental governance and data vacuum as well as the lack of funding for environmental protection. Discussed below are some of the environmental impacts of conflict in the world. Nuclear weapons affect climate and environmental globally (Makhijani et al., 2000; Scheffran et al., 2016). Conflicts induced by climate change could contribute to global insecurity, which, in turn, could enhance the chance of a nuclear weapon being used, could create more fertile breeding grounds for terrorism including nuclear terrorism, and could feed the ambitions among some states to acquire nuclear arms (Scheffran et al., 2016). Another issue is that any war destroys buildings and infrastructures which need to be rebuilt and consume enormous resources and add to emissions.

1.2.1. Impact of conflict on forest cover

The effects that conflict has on forest cover are an emerging concern for conservation, partly due to the occurrence of war in forest's rich areas in a way that various scholars have tried to demonstrate the impact of conflicts on forest cover and its implication on biodiversity. For example, a study in the Atlantic Coast of Nicaragua confirmed that conflict-related factors were partially responsible for forest cover change (Stevens et al., 2011). Another study on woody cover change in Colombia between 2001 and 2010 also showed that the impact of illegally armed groups has reduced forest cover, particularly in areas rich in gold and lands appropriate for cattle grazing (Foster, 2001; Sánchez-Cuervo and Aide, 2013). Similarly a study by Westing (2011) on Vietnam, revealed that aerial application of Agent Orange and other herbicides during war, defoliated 14% of the country's forest cover and over 50% of its coastal mangroves. According to Westing (2013), limited warfare can result in severe, widespread, and long-term environmental damage. This has been demonstrated by a study of the effects of high-explosive munitions (bombs and shells), chemical anti-plant agents (herbicides), and heavy land-clearing tractors ('Rome plows') as employed by the USA in South Vietnam during the Second Indochina War of 1961–1975 for the purpose of extending large-scale area denial. Although the ecological damage to South Vietnam was severe, the area-denial techniques used were of a doubtful military success.

The indirect effects of conflict often have more far-reaching impacts than the direct destruction on battlegrounds. Military expenditures can come at the expense of other government programs, including natural resource management. For example during the wars in Afghanistan and Iraq 2008, the US government military budget was increased alongside an 8% reduction for the budget of the U.S. Forest Service (Daly, 2008). This had an implication in the forest management sector by cutting the budget of the forest service.

The Rwandan genocide led to the killing of roughly 800,000 Tutsis and moderate Hutus (Zorbas, 2004). The war created a massive migration of nearly 2 million Hutus fleeing Rwanda over the course of just a few weeks to refugee camps in Tanzania and the Democratic Republic of the Congo (DeWeerd, 2008). This large displacement of people in refugee camps put pressure on the surrounding ecosystem. Forests were cleared in order to provide wood for building shelters and used for firewood (DeWeerd, 2008). These people suffered from harsh conditions and constituted an important threat impact on natural resources (Kanyamibwa, 1998).

However, the effect of conflict on forest cover is not always negative. This view is supported by Suthakar and Bui (2008), a study in Jaffna Peninsula, Northern Sri Lanka. It revealed that the land use/cover pattern has been very dynamic during war, showing a remarkable decrease in agricultural land use and concomitant increase in forest cover. Another study in Nepal showed that forest user groups facing severe armed conflict showed an increase in forest density (Karna et al., 2010). These results emphasize the capacity of local institutions to organize and cooperate even in extremely vulnerable situations, building trust and reciprocity for sustainable forest use and management (Karna et al., 2010). A study in Swat and Shangla, Pakistan also highlighted that deforestation that appeared during periods of conflict was not as

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