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# Ethnic cleansing or resource struggle in Darfur? An empirical analysis ☆

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ABSTRACT

The conflict in Darfur has been described both as an ethnic cleansing campaign, carried out by the Sudanese government and its allied militias, and as a local struggle over dwindling natural resources between African farmers and Arab herders. In this paper, we use a previously unexploited data set to analyze the determinants of Janjaweed attacks on 530 civilian villages in Southwestern Darfur during the campaign that started in 2003. Our results clearly indicate that attacks have been targeted at villages dominated by the major rebel tribes, resulting in a massive displacement of those populations. Resource variables, capturing access to water and land quality, also appear to have played an important role. These patterns suggest that attacks in the area were motivated by both ethnic cleansing and resource capture, although the ethnic variables consistently have a larger impact.



## 1. Introduction

The conflict in Darfur is one of the worst humanitarian disasters in the world. Since the onset of hostilities in 2003, it is estimated that some 300,000 people have died and that 2.7 million people have fled their homes (BBC, 2008). In a statement before the US Congress, State Secretary Colin Powell referred to the conflict as a genocide already in September, 2004.[1] The war has led to a massive international aid operation as well as the deployment of a large UN-backed peace-keeping force. On July 12, 2010, the prosecutor of the International Criminal Court (ICC) in the Hague extended the previous warrant of arrest for Sudan's incumbent president Omar al-Bashir to also include genocide, in addition to war crimes and crimes against humanity in Darfur (ICC, 2009, 2010).

In this article, we use a previously unexploited data set to analyze the determinants of attacks on 530 civilian villages in Southwestern Darfur. Our data was collected by an international organization working in the area and covers attacks perpetrated during the campaign that was initiated by the government and the Janjaweed militia in 2003.[2] The data set is unique in the sense that it includes detailed information about the ethnic composition in villages before and after the onset of the conflict and comprises all known rural villages in the area. On the basis of our reading of the literature, we propose two main hypotheses that we bring to the data: The probability and intensity of attacks on villages should increase with (i) the proportion of rebel tribes in the village population and (ii) with the level of appropriable natural resources.

The first of these hypotheses – stipulating a targeting of certain ethnic groups by the government and its loyal militias – receives very strong support in our empirical investigation. Regardless of our choice of resource variables, control variables, samples, and levels of aggregation, we consistently find that the proportion of Fur, Masalit, and Zaghawa (rebel tribes) households in the village population before conflict is our strongest determinant of the probability and intensity of attacks. We further show that about 59,000 rebel tribe households have been displaced from our area of study and that 329 villages out of 530 in our sample have been completely abandoned during the conflict. We argue that

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[1] In Powell's own words: "When we reviewed the evidence compiled by our team, along with other information available to the State Department, we concluded that genocide has been committed in Darfur and that the Government of Sudan and the jinjaweid bear responsibility – and genocide may still be occurring." (America.Gov, 2004). It is further interesting to note that the investigation commissioned by the UN Security Council found evidence of crimes against humanity but not of genocide (United Nations, 2005).

[2] Given the current security situation in Darfur, we have agreed not to disclose the identity of the organization(s) that have provided the data that our study builds upon. Until the situation in the area improves, more details about the data will only be communicated through personal correspondence with the authors.

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our results are clear indications of an ethnic cleansing campaign and of serious violations of international law.

This finding conforms broadly with the general view of the ICC and the international community. In the most recent version of the warrant of arrest against Sudan's president, the ICC briefly refers to "acts of murder and extermination" being perpetrated against the Fur, Masalit, and Zaghawa groups in certain localities in West Darfur (ICC, 2010, p 6). The arrest order specifies three potential cases of genocide in the region. Among very few studies on Darfur in the wider social science literature, Hagan and Rymond-Richmond (2008) analyze 932 individual interviews collected by the American Bar Foundation among refugees in Chad and identify the Sudanese government's "racial dehumanization"-campaign against the three rebel tribes as key for understanding the acceptance among local Arabs to participate in ethnic cleansing against the civilian population of the targeted groups. Similar conclusions have been drawn by Kevane and Gray (2008) and Prunier (2007).[3]

Compared to these investigations, our study covers information from a much larger part of the Darfur population (530 villages that host approximately 792,000 individuals) and is the only study with village-specific information on ethnic composition before and after conflict.

Our second main hypothesis – that an important determinant of attacks was the level of appropriable natural resources in the villages – also receive some support. On the basis of GIS data, we create a number of proxy variables for appropriable natural resources; the density of vegetation, access to alluvial soils, and distance to surface water. We also create measures for related variables such as distances to roads and administrative centers and control for neighborhood spillover effects, altitude, population size, regional effects, etc. Our regression analysis shows that when we hold all other variables constant, villages that are located close to alluvial soils and to roads tend to suffer from a higher probability and intensity of attacks. The marginal impacts are however smaller than for the ethnic variables.

The official view held by the GoS is that the hostilities in Darfur are primarily a local struggle over dwindling natural resources between farmers and herders with no government involvement and that the conflict probably has not taken more than 10,000 lives. The importance of land degradation and a deteriorating climate for understanding Darfur has also been emphasized by UNEP (2007) and Ki-Moon (2007). Among scholars, Sachs (2006) makes a similar argument and supports his line of argumentation on the finding that decreased rainfall has been shown to have an indirect effect on conflict risk in Africa via poor economic growth (Miguel et al., 2004). Using annual data on rainfall in Darfur, Kevane and Gray (2008) fail to find any clear link between rainfall and conflict onset.

As far as we can tell, the only other quantitative study on the role of natural resources in Darfur is Vanrooyen et al. (2008) who use interview data from refugees in Chad in order to analyze in detail the nature of attacks and the scope of human and resource losses in three villages. Olsson (2010) uses the same data as we do but focuses exclusively on land reallocation issues and implications for post-conflict reconstruction.[4]

The empirical study in this paper is related to a large volume of articles studying the general determinants of civil war and social conflict using cross-country data (Azam and Hoeffler, 2002; Collier and Hoeffler, 1998, 2004; Fearon and Laitin, 2003; Miguel et al., 2004). The specific role of environmental stress and scarcities is given particular attention in Homer-Dixon (1994), Diamond (2005) and Schubert et al. (2008), but more formal statistical analyses have generally not found any strong effect of environmental stress on conflict risk (Nordås and Gleditsch, 2007). The analysis in this paper is one of rather few other attempts at analyzing the determinants of violence at micro level.[5] What makes our study unique compared to existing analyses is primarily the detailed village level data on the ethnic composition before and after the onset of the conflict. Also, unlike any of the papers surveyed, we find robust evidence of aggression primarily targeted at certain ethnic groups.

Our article is structured as follows: In Section 2, we provide a general background to the conflict in Darfur and discuss the nature of ethnic cleansing and the specific context of our study. In Section 3, we discuss theoretical considerations relevant for specifying the empirical model. The data, the empirical strategy, and the regression analysis are presented in Section 4, whereas Section 5 concludes.

## 2. Background[6]

### 2.1. The Darfur conflict

Darfur is Sudan's westernmost province, sharing an extensive border with Chad in the west and with an area of roughly 500,000 sq km (approximately the size of Spain). Its northern parts are largely uninhabited desert areas, whereas the central and southern parts belong to the African Sahel belt.

Darfur is believed to host about 6.5 million inhabitants belonging to a multitude of ethnic groups. The population is often subdivided into "African" and "Arab" tribes, although the distinction between the two is not always clear. The African tribes are usually sedentary agriculturists and include some of the largest and traditionally most influential groups such as the Fur tribe, which has given the region its name.[7] The Arab tribes are typically either cattle or camel herders and practice a nomadic lifestyle with seasonal migrations across farmer lands. Both the African and Arab tribes are Muslim and Arabic serves as lingua franca in the region.

The recent conflict in Darfur is generally regarded to have started in February 2003 when the rebel groups JEM (Justice and Equality Movement) and the SLA (Sudanese Liberation Army) announced their programs in opposition to the government in Khartoum. The SLA group consisted mainly of Fur and Masalit tribesmen, whereas JEM was dominated by the African (yet nomadic) Zaghawa tribe. Both groups claimed that the basic reason for their rebellion was the consistent marginalization of Darfur in a national context. Fig. 1 gives a schematic overview of the sequence of events. After some successful initial attacks on government outposts, which appeared to catch the GoS by surprise, Khartoum started to mobilize loyal Arab tribes in Darfur to fight SLA and JEM (stage 2 in Fig. 1) (Flint and de Waal, 2008; ICC, 2009; Prunier, 2007). The Sudanese army was still engaged in the south to secure the emerging peace process with the SPLA rebels. To date, the GoS still denies that it has played any role in the mobilization and subsequent actions of the Janjaweed.

[3] The government of Sudan (GoS) however denies any links to the Janjaweed and to the conflict (Prunier, 2007).

[4] In a recent study based on satellite imagery, Schimmer (2008), claims that the large population and livestock displacements have recently resulted in a resurge of vegetation in the area. Further empirical studies of the conflict in Darfur include Depoortere et al. (2004), who provide estimates of mortality during the first year of the crisis. Bloodhound, a Denmark-based NGO, has independently compiled a large number of witness accounts of attacks (Petersen and Tullin (2006a). Bromley (2010) investigates to what extent satellite data on fires in the area can serve as a proxy for violence.

[5] Buhaug and Röd (2006) study the determinants of civil war in Africa by using grid cells with a resolution of 100 × 100 km as the basic unit of analysis. In a study of more than 5000 villages in Aceh, Indonesia, Czaika and Kis-Katos (2009) find that ethnicity does not seem to matter much for (forced) migration patterns and that general socio-economic variables matter more. Other studies with conflict intensity as the dependent variable include Murshed and Gates (2005) and Do and Iyer (2007) (on 75 districts in Nepal) and Bellows and Miguel (2006) (on 152 chiefdoms in Sierra Leone). See also André and Platteau (1998) and Verwimp (2005) who both study individual-level data from Rwanda and show that land stress appears to have played a key role for the conflict outbreak in 1994. Blattman and Miguel (2010) provide a recent overview of the literature on civil war.

[6] The general information in this section builds mainly upon Prunier (2007) and Flint and de Waal (2008).

[7] "Darfur" means literally "the land of the Fur".