

The Geography of Foreign Aid and Violent Armed Conflict

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Abstract

Existing databases on foreign aid – the CRS and now PLAID – are project-based. And yet nearly all empirical analyses using these data aggregate to the country-year level, thereby losing project specific information. In this paper, we introduce new data on the geographic location of AidData aid projects that have been committed to countries undergoing violent armed conflict between 1989 and 2007. We map the foreign aid projects as well as violent event locations and then examine the correlation between the aid and conflict zones. We compare, furthermore, the association between aid and conflict over time in order to understand how much aid to conflict countries is given to conflict areas. We first consider aid given to most African countries and then analyze the conflicts and Mozambique and Angola in greater depth. These data provide an important, disaggregated view of aid and conflict. More generally, our research provides a crucial first step in geocoding foreign aid projects throughout the world.

Introduction

Existing databases on foreign aid – the OECD Creditor Reporting System and now BYU’s Project Level Aid database (PLAID) – are project-level. And yet nearly all empirical analyses of aid effectiveness using these data aggregate to the country-year level, thereby losing project specific information. The lack of project and location-specific information is a serious deficiency in the current aid literature. Examining aggregate aid to a country without regard to geographic context can provide an unclear and potentially incorrect view of the effect of aid within that country. This problem is especially concerning if the outcomes of interest in a country are location-specific.

The purpose of this paper is to examine the project level and geographic-specific effects of aid on armed conflict. Because conflict is typically localized, occurring largely within a specific region of a country, the current assessments of the aid/conflict literature that use country-level data for both aid and conflicts may be doubly problematic. Aid granted to Sri Lanka, for example, but that excluded some regions that were primarily Sinhalese or Tamil, has likely caused more problems than it has solved due to the perceived slight to these regional ethnic groups. The aid has likely been a contributing factor to the over twenty-five year conflict in Sri Lanka between the Sinhalese and the Tamils (Hyndman 2009), but existing data do not allow us to distinguish well. Currently, if a high level of aid is given to Colombo, Sri Lanka and escalated conflict occurs in Trincomalee, the data for both aid and conflict used in research are aggregated to the country-year level and a relationship between the project-based aid and the localized conflict is assumed. This correlation between aid and conflict may be spurious or it may be meaningful in ways undiscovered in current research.

The studies using data at a sub-country level that do exist are largely case studies which provide valuable insight into individual conflicts in countries such as Sri Lanka (Hyndman 2009) and Rwanda (Adelman, Suhrke 1996). However, because these case studies are concerned with the outcomes of one, or a few, specific projects. These case studies often do not allow for an understanding across multiple projects, even within a given region, or generalization outside of the particular city or region.

There are two substantial problems stemming from the current scarcity of within-country analyses. First, because existing studies generally lack analysis of inter-province or inter-city-specific aid distribution levels, assessing the impact of foreign aid within a country on conflict that is localized is nearly impossible. Due to the limited scope of existing studies, their findings have little external validity and must be generalized to a broader scope with caution. For instance, simply because aid may have contributed to extremely localized conflict in Sri Lanka, aid to a similarly heterogeneous country such as India might not have led to any incidents of violence. Second, because currently only case studies examine the relationship between aid and conflict in individual countries, any generalization of their findings must be done with extreme caution.

This paper examines the distribution of aid at a sub-country level, to province and city levels wherever possible. It does so through a process of geographically coding individual aid projects and analyzing their occurrence in conjunction with the geographical locations of incidents of armed conflict to determine whether there are any “clustering” effects spatially

and temporally. We introduce new data on the geographic location of foreign aid projects that have been committed to countries that have undergone violent armed conflict between 1989 and 2007. We map the foreign aid projects as well as violent event locations and zones and then examine the correlation between the aid and conflict zones. We compare, furthermore, the association between aid and conflict over time in order to understand how much aid to conflict countries is given to areas undergoing armed conflict.

This paper represents the first attempt to geocode aid data on a multi-country scale. The data are confined to aid going to African countries that have experienced armed conflict between 1989 and 2007. It provides an important first step in the geocoding of foreign aid projects throughout the world. Further, it highlights the importance of geocoding in obtaining stronger and more specific empirical results on aid effectiveness by giving an example of its usefulness in aid analysis. While this paper provides only one sectoral example of that increased empirical accuracy, its basic methodology can be effectively utilized in other sectors or in studies of aid effectiveness in general.

Foreign Aid and Armed Conflict

The available literature on the geocoding of foreign aid is extraordinarily sparse. In fact, only one relevant study has been performed, examining European foreign aid to post-Cold War Russia. Lankina (2006) investigated governance-driven aid distribution within Russia, finding that geographic proximity to the European Union was a significant factor in determining the amount of aid granted to a region, with Russia's northwest receiving the highest level of foreign aid intended for improved governance. This article is limited in its scope, but represents the primary current knowledge of the sub-country geographic distribution of foreign aid.

The limited selection of current literature on aid and conflict is largely negative in tone. Most studies find a positive correlation between aid levels and increased incidence of conflict. There are, however, many different hypotheses of why high levels of foreign aid seem to fuel conflict in less-developed countries. Regardless of the proximate causes hypothesized by researchers, most studies at both the macro and micro levels reflect this disturbing trend, although there has been some research that shows a favorable relationship between increased aid and the cessation of ongoing conflict, in particular.

In many cases, it is probable that foreign aid originally intended for specific purposes is diverted to increase military expenditure in the recipient country. This fungibility of aid can occur because aid money displaces government funds originally destined for specific projects, or because recipient governments simply utilize aid funds for military spending, rather than for their intended purpose. In particular, aid destined for agriculture, energy, or education projects are easily redirected by recipient governments for other purposes, including military budgets (Feyzioglu, Swaroop and Zhu 1998). This misappropriation of aid for higher military expenditure is estimated to occur with 11.4% of all foreign aid within the poorest African nations, and may be responsible for as much as 40% of these countries' military budgets (Collier 2009). Further, this increase in military expenditure may ignite regional arms races (Collier and Hoeffler 2007). Finally, Collier (2009) found that this increase in military expenditure significantly increases the risk of conflict.

Aid may also contribute to conflict through leading to human rights abuses by the recipient government. Structural adjustment loans, in particular, may contribute to human rights abuses. In the year of structural loan negotiation, human rights abuses typically decrease. However, once the loan is secured, human rights violations by the recipient government increase significantly (Abouharb and Cingranelli 2006). These human rights violations may lead to civil war in many cases.

Not all studies of aid and conflict find a negative impact of foreign aid on violent conflict, however. Arcand and Chauvet (2001) find that aid decreases the probability that violent conflict will occur. Arcand and Chauvet do state, however, that “the uncertainty of aid plays a destabilizing role in that it increases the probability of civil war.” Further, Deree and Nillesen (2009) find that a 10% increase in foreign aid will increase the probability that an ongoing conflict will end by 8%.

Similarly, there is disagreement between studies of donor reaction to the outbreak of conflict in their aid commitments and disbursement. Often, donor governments see aid as a means to reinforce foreign alliances, or distribute aid based on former colonial relationships (Alesina and Dollar 2000). To these donor countries, domestic politics and military stability are a secondary concern in determining aid commitments which are largely determined by factors outside of the borders of the recipient country (Alesina and Weder 2002). Alesina and Weder further find that government corruption does not lead to a decrease in foreign aid commitments. In contrast, it has been suggested that donor countries do decrease aid commitments to countries undergoing armed conflict (De Ree and Nillesen 2009).

The case study literature has investigated several incidents of armed conflict in which donor countries may have been a contributing factor. There are several ways in which aid can lead to conflict. Aid given disproportionately to one group or region within a nation can inflame ethnic and geographic tensions. Alternatively, government aid can act as an incentive for rebel groups to revolt by increasing the potential returns to obtaining the reins of power (Collier 2009). Aid does not always contribute to increased violence, and may even alleviate violence in some cases.

In particular, donor activity during the buildup to the genocide in Rwanda is deserving of attention. The failure of donors to adopt sufficiently strong human rights conditionality enabled the Rwandan government to continue its abhorrent practices (Adelman and Suhrke 1996). It has been suggested that “aid financed much of the machinery of exclusion, inequality, and humiliation; provided it with legitimacy and support’ and sometimes directly contributed to it” (Uvin 1998). These donor nations largely had the ability to influence Rwandan policy, but failed to properly utilize that influence for the better (Uvin 1998).

In Sri Lanka, aid given disproportionately to the more developed southwest region surrounding the capital city of Colombo exacerbated ethnic tensions, contributing to the long-standing conflict between the Sinhalese majority and the Tamil rebellion (Hyndman 2009). By ignoring ethnic divisions within a recipient country, donors often inadvertently cause conditions to worsen rather than improve.

Case studies have also addressed the question of how donor countries react to outbreaks of violence within less-developed nations. Aid to Palestine was increased by approximately

50% from 2006-2007 in spite of the ongoing conflict occurring within the country (Stotsky 2008). It was found that this increase in aid decreased government reliability upon tax receipts, lessening its responsiveness to public demands. Similar to the findings of research in Rwanda, a severe lack of negative conditionality has also been cited as a contributing factor to the violence in Palestine (Stotsky 2008).

Micro-level studies have confirmed the macro findings of the highly fungible nature of foreign aid. (Webersik 2006) finds that foreign aid largely enriches the prosperous business class, which has an interest in perpetuating the seemingly endless cycle of violence within Somalia. Vaux and Goodhand (2001) similarly found that aid was used to cement the privileged position of Kyrgyzstan's elite class, ultimately contributing to the conflict in that country.

While the available collection of micro-level studies are far more focused on individual instances where aid has exacerbated or even ignited conflict, this is certainly not always so. Research in Burundi has indicated that, if sensitive to local conditions and challenges, aid can be a positive factor in improving socioeconomic conditions and ameliorating violent conflict (Brachet and Wolpe 2005). Aid can help to alleviate conflict through promoting the reintegration of former soldiers into society and highlighting the positive impact of a cessation in conflict. Brachet and Wolpe caution, however, that donors must be careful to avoid granting aid disproportionately to one region or ethnic group, or providing aid in any way that reinforces the causes of ongoing conflict (2005).

Further case studies highlighting the potential positive outcomes of foreign aid in preventing conflict are available in Malaysia, Thailand, Bhutan, Mozambique, and Mauritius (Muscat 2002). The experiences of Thailand and Mauritius are particularly instructive. In Thailand, significant aid projects were undertaken in the poor Northeast region of Lam Nam Oon-home to the Sinic minority-despite projected returns to the project that failed to match potential disbursements to other parts of the country. By providing aid to a country with sensitivity to regional and ethnic minorities, donors can both improve the socioeconomic conditions of the minority and potentially assuage tensions that could lead to violent outbursts (Muscat 2002). Mauritius, on the other hand demonstrates the importance of accompanying attempts for national growth with "safety nets for segments of the population who have not benefitted equally in the country's rise" to higher economic development (Muscat 2002). Finally, Muscat argues that attempts should be made by the governments in conflict-prone areas-and encouraged by donors-to include minority political interests in governmental rule through involvement in governing coalitions (Muscat 2002).

Research Design

We begin by using discrete geo-coded data on aid projects that occur within a sample of African conflict countries between 1989 and 2007. We include all years that have had at least 25 battle related deaths in intra-state dyads involving governments versus rebels. Following this, we refine the study to a smaller sample of conflict countries: Angola and Mozambique. We, however, include more detailed information on the size of the aid project and different

types of violence such as terrorism and government-rebel battles, along with the number of deaths in the battles.

Geocoding the Aid Projects

To geocode the aid projects, we begin with the AidData data set. We geocoded aid projects since 1989 that are committed to African countries where there are armed conflicts. All country-years that are active, i.e. where there have been at least 25 battle related deaths, are included.¹ We began by coding only those projects that were added by PLAID/AidData (non-CRS), because the project data generally contain much more information with which to code geographic coordinates. We then geo-coded foreign aid projects to Angola, Mozambique and Liberia using both non-CRS and CRS data from AidData. For these countries, we have geocoded all known foreign aid projects for conflict and non-conflict years since 1989.

The same coding rules are used for all countries regardless of whether the data originated in the CRS or from PLAID/AidData. The source for information on which locations that receive aid is the columns in PLAID/Aiddata that contain project descriptions (long or short) or titles (in English and original languages). In the original PLAID/AidData dataset, the unit of analysis is project funding commitments. (PLAID Codebook) This structure is preserved in the geo-referenced datasets, which means that funding commitments that go to several localities are therefore not divided into several events. For every additional location per event an extra set of coordinates is added.

When locations have been identified the coordinates are determined through the American National Geospatial Intelligence Service (NGA). NGA has an online service called the GEOnet Names Server (GNS). This site is helpful because it contains names and coordinates of various administrative divisions, populated places, waterways, and objects. (<http://geonames.nga.mil/ggmagaz/geonames4.asp>). The latitude and longitude coordinates are recorded with a six decimal precision. The map projection used is the standard World Geodetic System 1984 (WGS 84). Google earth is also used in order to complement the GNS.

The system of geo-referencing used here distinguishes between pairs of coordinates on four main levels of precision, ranging from point locations, through two administrative divisions, to the country level. In addition to the four main precision categories there are four additional scores in order to further separate different levels of certainty in the coding. This makes it possible for users of the dataset to select subsets that contain different levels of precision. The higher the precision the fewer the observations will be. Sources vary greatly in the precision that locations are reported; sometimes the exact location is named, in other instances the general area is reported, while sometimes the country as a whole is the intended

¹ See Uppsala Conflict Data Program for more information on definitions.

beneficiary (such as for a program to combat AIDS/HIV for the entire population). The criteria for precision codes are as follows:

- 1-2:** Used when a location lies within (1) or near (2) a specific populated place or object.
- 3:** Used for a district or municipality.
- 4-5:** Used for a specific province (4) or a greater region (5)
- 6:** Used when a project is national in scope.
- 8:** Used when aid flows directly to a government entity.
- 7 and 9:** Used when no location is given or location is unclear

We provide two examples to illustrate how the projects are geocoded based on this coding scheme: a clear and then unclear project. Example Project 1: Title: Integrated project of social-community development in Cambambe and Cazenga

Latitude 1	Longit. 1	Name 1	Precision 1	Latitude 2	Longit. 2	Name 2	Precision 2
-9.5	14.66667	Cuanza Norte	3	-8.82139	13.29111	Luanda	1

In example project 1, the precision code 3 for the first coordinate indicates that coordinates correspond to a municipality, precision code 1 for second coordinate indicates a specific city. First 1 and 2 refer to provinces in which locations lie. Example Project 2: Long Description: Enhanced household food security in targeted communities

Latit. 1	Longit. 1	Name 1	Precision 1	Latit. 2	Longit. 2	Name 2	Precision 2
-12.5	18.5	Luanda	9	-8.838	13.234444	Luanda	7

In example project 2, the country coordinate is coded first, country capital is coded second. Precision codes of 9 and 7 indicate that location of aid project is unclear and that the project is not assumed to be national in scope.

If there is no direct mentioning of any location in the sources, aid is assumed to go to the country in general or to the main administrative centre (most often the formal capital). Both possibilities are coded, the country level in the first set of coordinates and the capital in the second. This means that it is up to the researchers using the data to decide if unclear aid locations should, by default, be excluded, be assumed to go to the country, or to the capital.

Figure 1 shows the geographic coordinates we have coded for all the countries with conflict throughout Africa. Although we have completed a substantial amount of geocoding, much remains to be done. Thus far, we have coded 21,218 discrete projects in Africa for a total of 38,471 separate geographic coordinates. We have completed nearly every project for Angola, Mozambique, and Liberia for the years 1989-2008, and most non-CRS projects (i.e., those added by PLAID/AidData) for other countries.

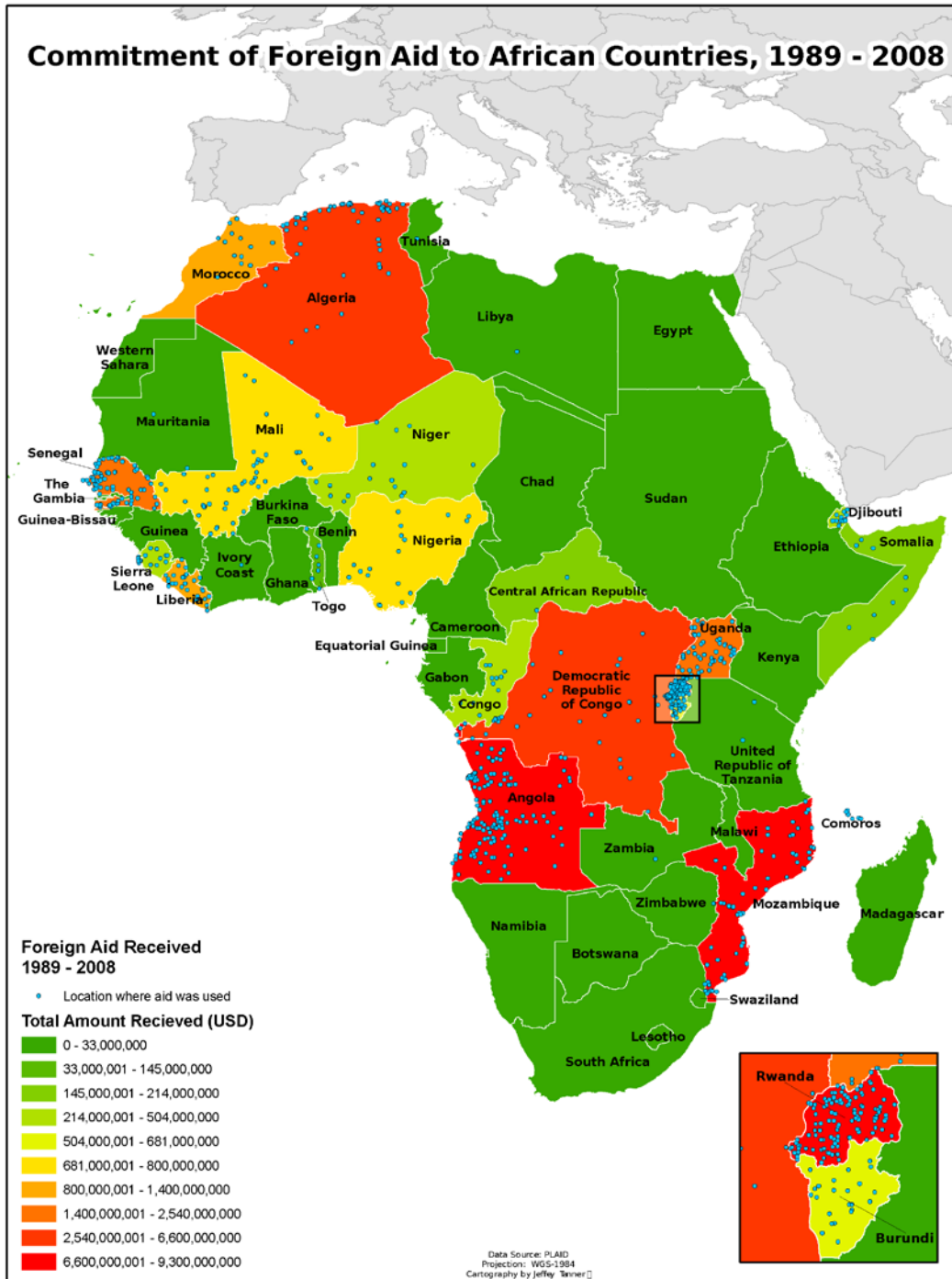


Figure 1: Aid projects we have coded thus far in Africa. Each dot represents a discrete aid project and the countries are shaded based on the amount of aid received during the period 1989-2008. (Note: we have completed significant coding for other countries such as Sudan and Chad, but are still cleaning these data and therefore did not include them.)

The cartogram in Figure 2 provides a second way of visualizing the countries for which we have coded aid thus far. The size of the country is based on how much aid in terms of project numbers have been committed to these countries during conflict years.

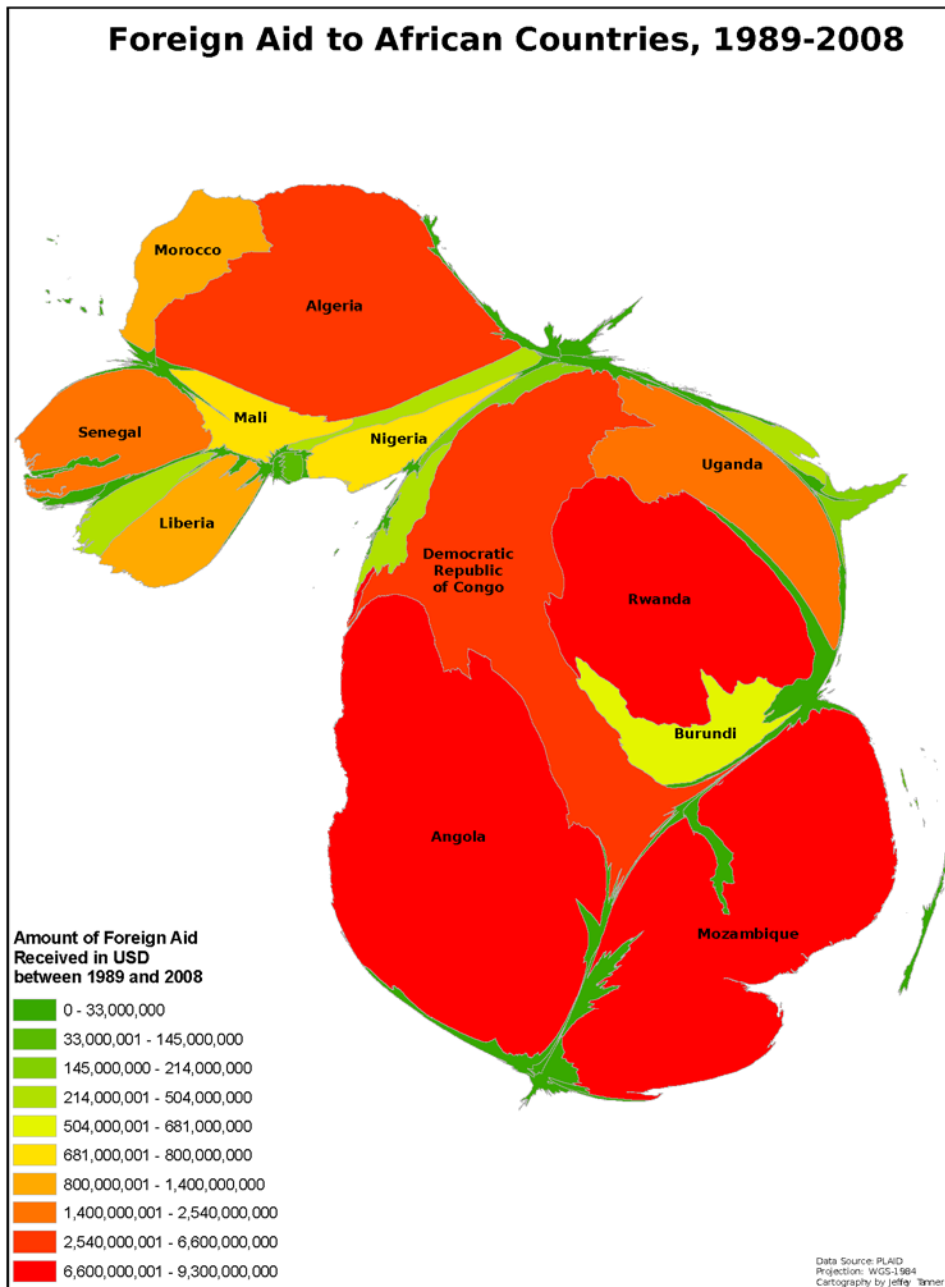


Figure 2: A cartogram of the amount of aid coded for Africa. Note that this figure is not intended to show any sort of final picture of how much aid is going to different African countries; rather Figure 2 simply illustrates how much we have coded thus far.

Geocoding the Conflict Data

The conflict zone data, the battle data from the Uppsala Conflict Data Program, and most terrorism data are not mutually exclusive. The UCDP avoids the difficult question of

defining terrorist acts by only separating between battle related deaths within a couple of categories and one-sided violence, which includes terrorist acts as well as massacres. Some battle related deaths would be counted as terrorist attacks by some observers but are coded as battle related if some form of military target or even a government official or building is the target of the attack. We avoid the difficult questions surrounding the operationalization of different types of violence, by instead considering each of the different possibilities. We begin with the conflict zones.

Conflict Zones

The data on conflict zones have previously been used in Rustad, et al (2008) and cover the years 1990–2004. The part of the data that covers Africa is similar to that used by Buhaug and Rød (2006). The conflict zones are based on qualitative estimations of the areas that have seen the most fighting in conflict countries. Although the conflict zones are reported annually in the dataset, the level of variation over time is limited.

Battle Locations

In order to move beyond the limits of using data on qualitatively coded conflict zones, we also consider data on discrete battle locations in Angola and Mozambique. This data is used with permission of the Uppsala Conflict Data Program, which is currently geo-coding battle events data. The dataset covers the years between 1989 and 2009 where there are at least 25 battle related deaths. Only incidents with at least one battle related death are recorded.

Terrorism Data

In addition to the geocoded data on aid projects, conflict zones, and battle locations, we have coded the geographic coordinates for approximately 60,000 terrorist incidents found in the Global Terrorism Database for the years 1970–2004. These terrorist incidents were matched with city names, then assigned coordinates based on their matching locations. If multiple cities matched the terrorist data, locations were selected based on population size, with the larger population assumed as the incident location. If no matching location was found, alternate spellings were attempted using other databases. Should a location still not be obtained using other databases, Google Earth or the National Geospatial-Intelligence Agencies' GeoNames Search database was used to determine the incident location.

Mapping the Data

In this section, we present an overview of geocoded foreign aid projects and conflict zone data in Africa. Following, we consider the cases of Angola and Mozambique and examine the relationship between foreign aid and different types of conflict at a local level.

Foreign Aid and Conflict Zones

We begin by *describing the overlap* between aid locations and conflict zones without any ambitions to explain the causal direction or mechanism. Next, we examine trends over time

from 1990 to 2004 in patterns of aid allocation to conflict and non-conflict zones with an eye towards understanding whether aid and conflict zones overlap more or less over time.

The data presented in Figure 3 represent discrete data points for the foreign aid projects and areas (polygons) for the conflict zones. Because the conflict zones are areas (polygons) we calculate the value of the aid that is committed to locations occurring within conflict zones, year by year. The value is based on US dollars in constant 2000 values.

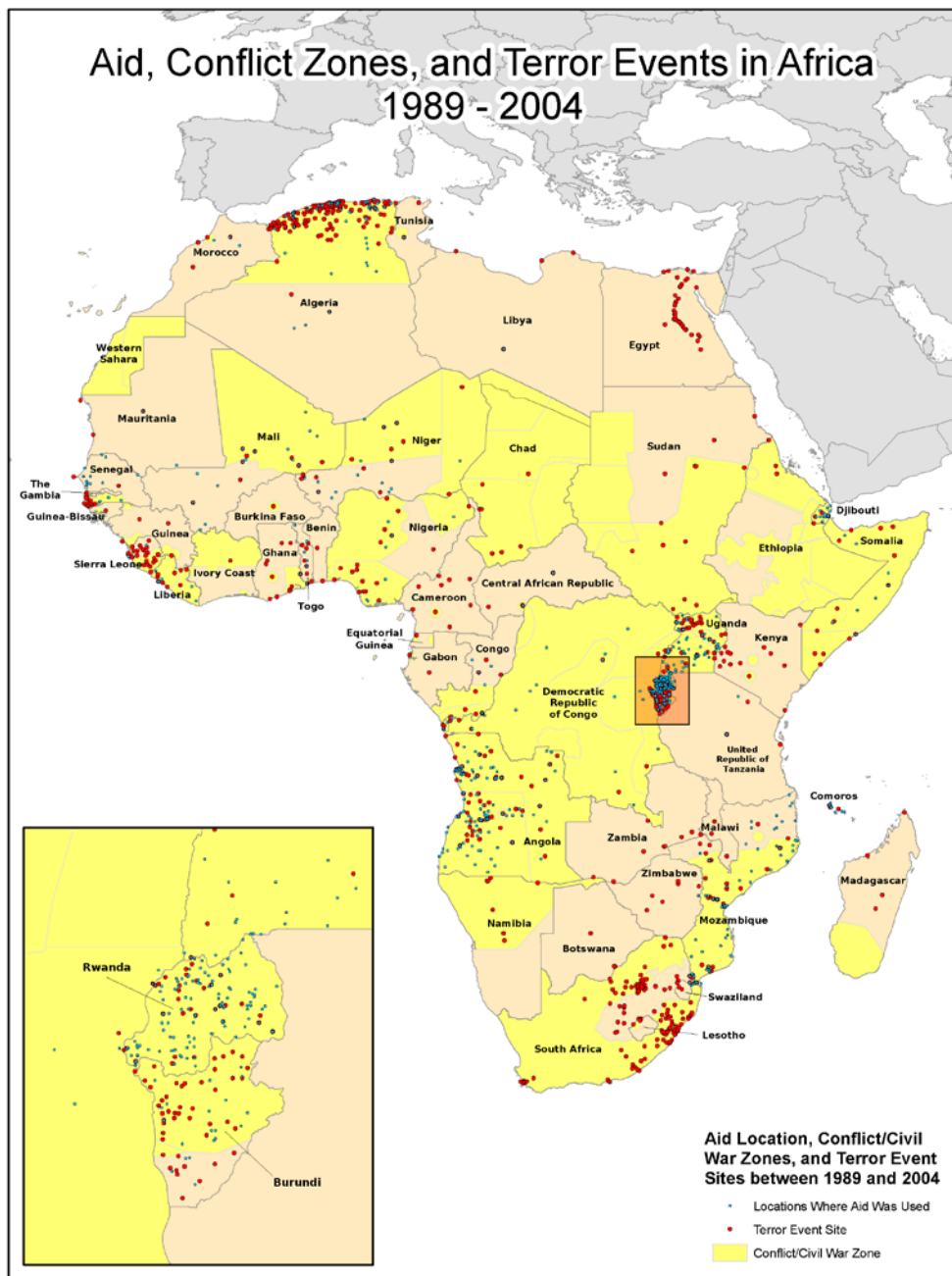


Figure 3: A representation of foreign aid (discrete projects in blue), terror event sites (discrete events in red) and conflict zones (polygons shaded in yellow).

Because we have geocoded data based on countries undergoing conflict, it is no surprise that foreign aid projects appear primarily in conflict prone countries (yellow shading) as well as countries with significant amounts of terrorism. Of interest to us, then, is how the patterns of aid vary within those countries undergoing armed conflict. Precisely, we are interested in knowing how much aid is committed to locations within conflict zones as opposed to aid committed elsewhere in a given country. And, following, we consider whether aid geographically maps to precise battle locations.

We begin by considering the proportion of total aid that is granted to conflict zones. As variation in the size of the conflict zone will naturally influence the amount of aid that it receives, we consider subsets of the data in four graphs. The first two results (Figures 4 and 5) are from the cases where the conflict zones are smaller than 25 and 50% of the country. The third is when the zones are greater than 50, 75 and 90%. Linear regression lines have been fitted to the observations to facilitate interpretation (they are not intended as any estimate of a causal or definitive effect).

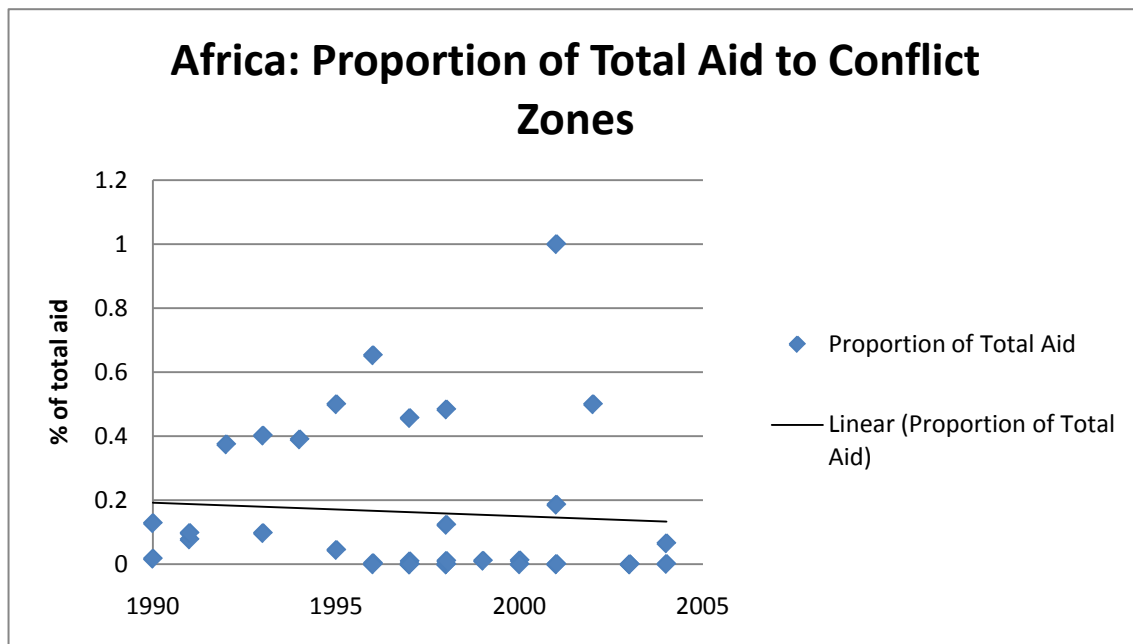


Figure 4. Aid to conflict zones smaller than 25% of the country

In the sub-set where the conflict zones are small in relation to the country size the amount of aid that the area receives seems to decrease over time. Examining the data closely indicates that Uganda might be driving these results as many of the smallest proportions apply there.

As the sample size increases to cover all cases up to 50% of the country the effect of time is reversed so that a greater proportion of aid reaches conflict zones over time, although this relationship appears to be only weakly positive. See Figure 5 below.

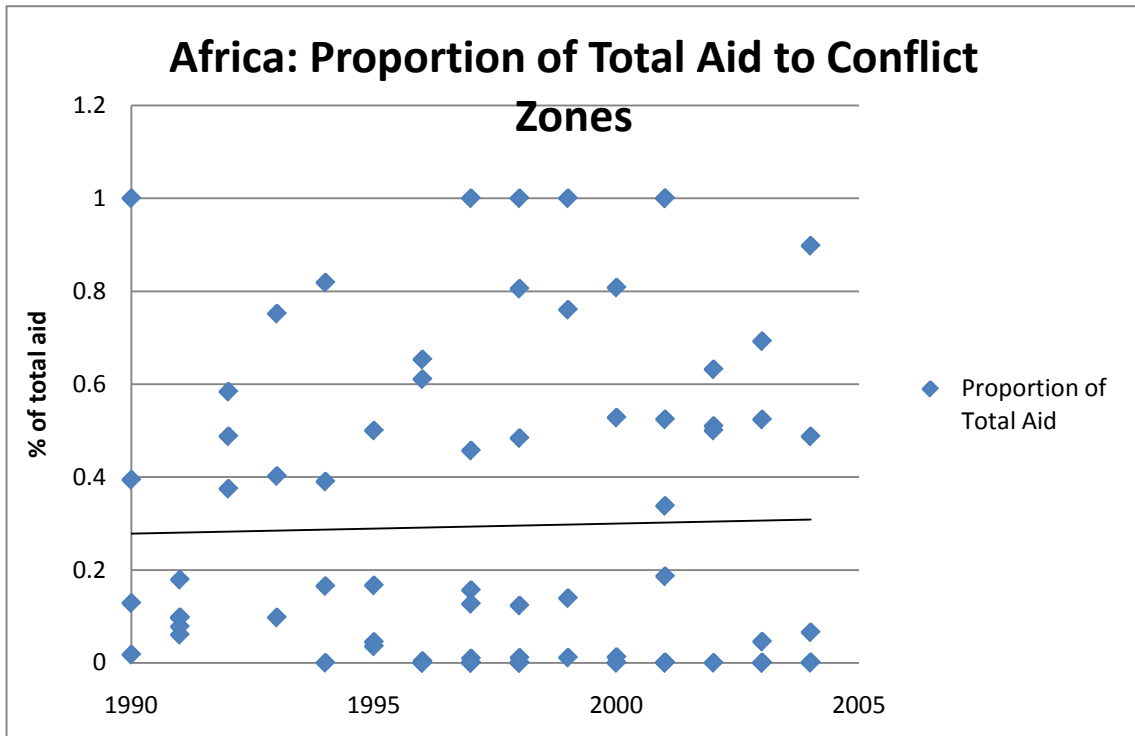


Figure 5. Aid to conflict zones smaller than 50% of the country

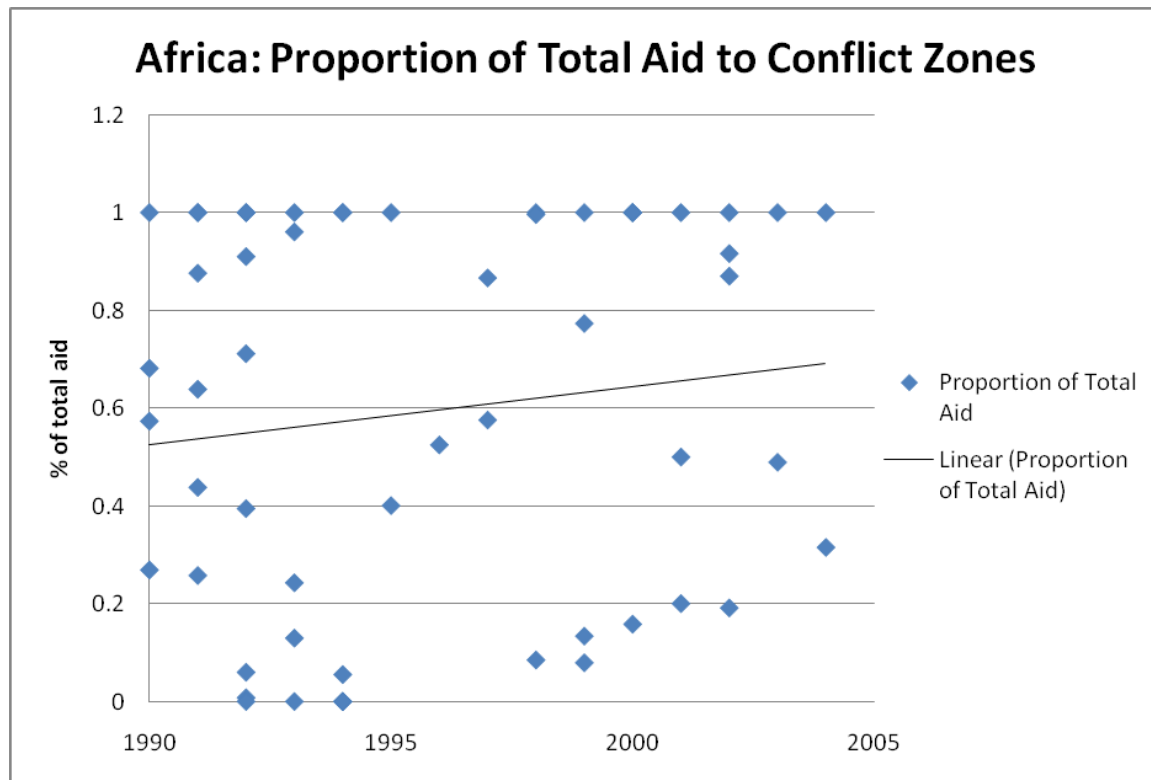


Figure 6. Aid to conflict zones greater than 50% of the country

Like Figure 5, the results when we consider aid granted to conflict zones greater than 50% of the country show in Figure 6 show that there is an increasingly greater proportion of aid being granted to conflict zones over time. These results are also stronger in magnitude. Turning to the countries with conflict zones that cover at least 75% of the country (Figure 7), the trend is also positive, but weaker.

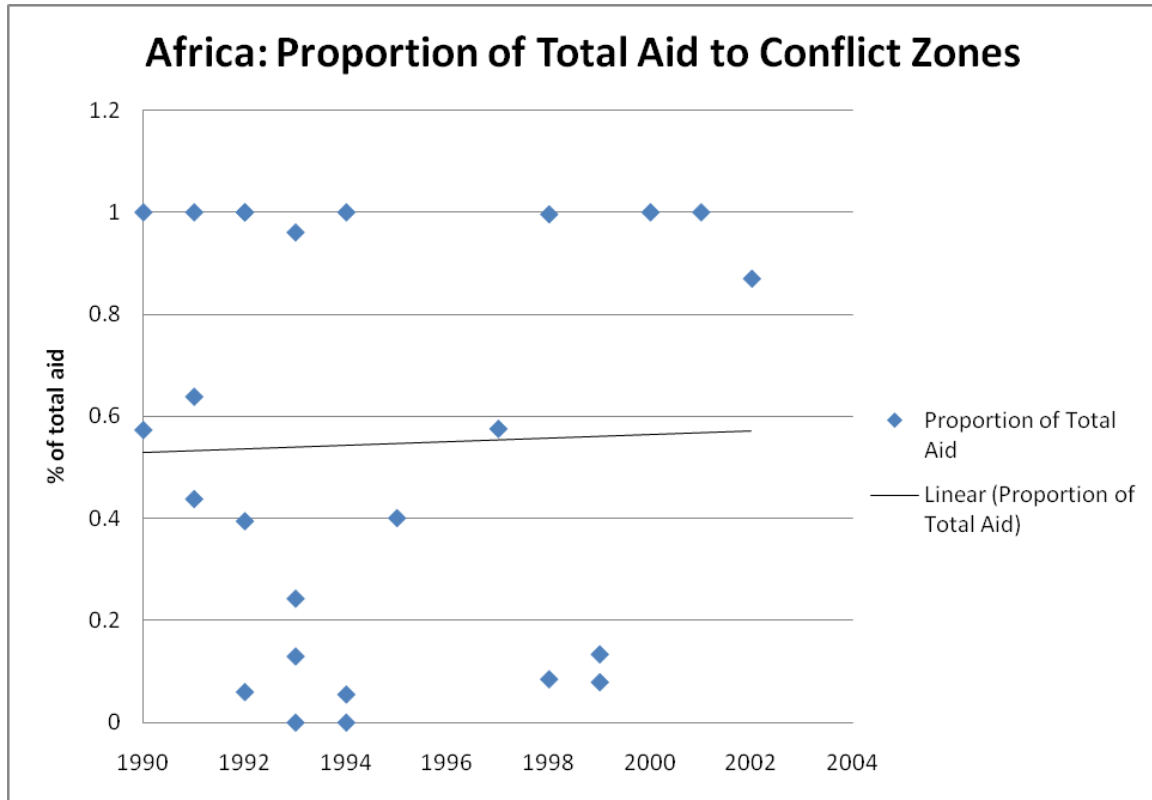


Figure 7. Aid to conflict zones greater than 75% of the country

These tentative results are mixed and more thorough analyses are needed in order to establish whether there has been a change in the allocation of aid to conflict zones over time. Upon the availability of additional data, more sophisticated panel models would allow us to speak more definitively about the relationship.

A very preliminary finding is that when conflict zones cover only a small portion of a country's land mass, donors will attempt to divert aid to the rest of the country. However, when conflict zones are not as easily avoided, donors actually increase the proportion of aid to the conflict zones. These preliminary findings are robust to alternatively specifying country groupings by quartile: groups from 25-50% conflict coverage and from 50-75% conflict coverage display the same slightly positive trends.

Aid and Violence in Angola and Mozambique

We now turn to a closer examination of two individual countries to examine patterns of aid and violence. We begin by considering some simple correlations between aid and violence in Angola and Mozambique, following which, we consider each country in much greater depth.

Table 1 shows simple correlations between aid and conflict outcomes. The results indicate a negative relationship between *total* aid flows and conflict, but mostly positive correlations between *conflict zone* aid and conflict. We are too early in our research to determine a direction to this relationship, but we note that these figures are based on aid commitments in the same year as battle. Thus, if anything, the aid is likely being committed in response to events taking place on the ground or in anticipation of battle events.

Correlations			
		Total Aid	Conflict Zone Aid
Angola	Death Count	-0.432	-0.060
	Battle Location Count	-0.355	0.239
Mozambique	Death Count	-0.998	0.924
	Battle Location Count	-0.687	0.415

Table 1: Correlations between aid given to the entire country / aid given only to conflict zones and death / battle counts in the two countries.

Aid and Conflict in Angola

Angola was embroiled in armed conflict for almost the entire period from 1990-2004, with only brief respites in 1996-1997 and 2003. In the early 1990s, the combat led to a steady decrease in GDP from \$10.278 billion in 1990 to \$4.06 billion in 1994, while total aid decreased from \$484.898 million to \$288.794 million over the same period, with a low point of \$131.404 million in 1993. Thus, while GDP decreased by over 60%, the proportion of total aid to GDP also went down from 4.718% to 2.357%. For the country as a whole, it seems that the extremely violent portion of the intrastate conflict influenced donor decisions on total funding for Angola.

A visual examination of the locations of aid projects and battle locations from 1989-2004 (Figure 8) shows that virtually every major conflict occurred in a region that had also received a substantial amount of foreign aid. Further, every terrorist event during this period with the exception of one occurred within or closely bordering an area with clear aid allocation. Figure (figure number?) appears to display a high incidence of clustering for aid, terrorism, and conflict locations. This is especially true with high levels of aid or deaths.

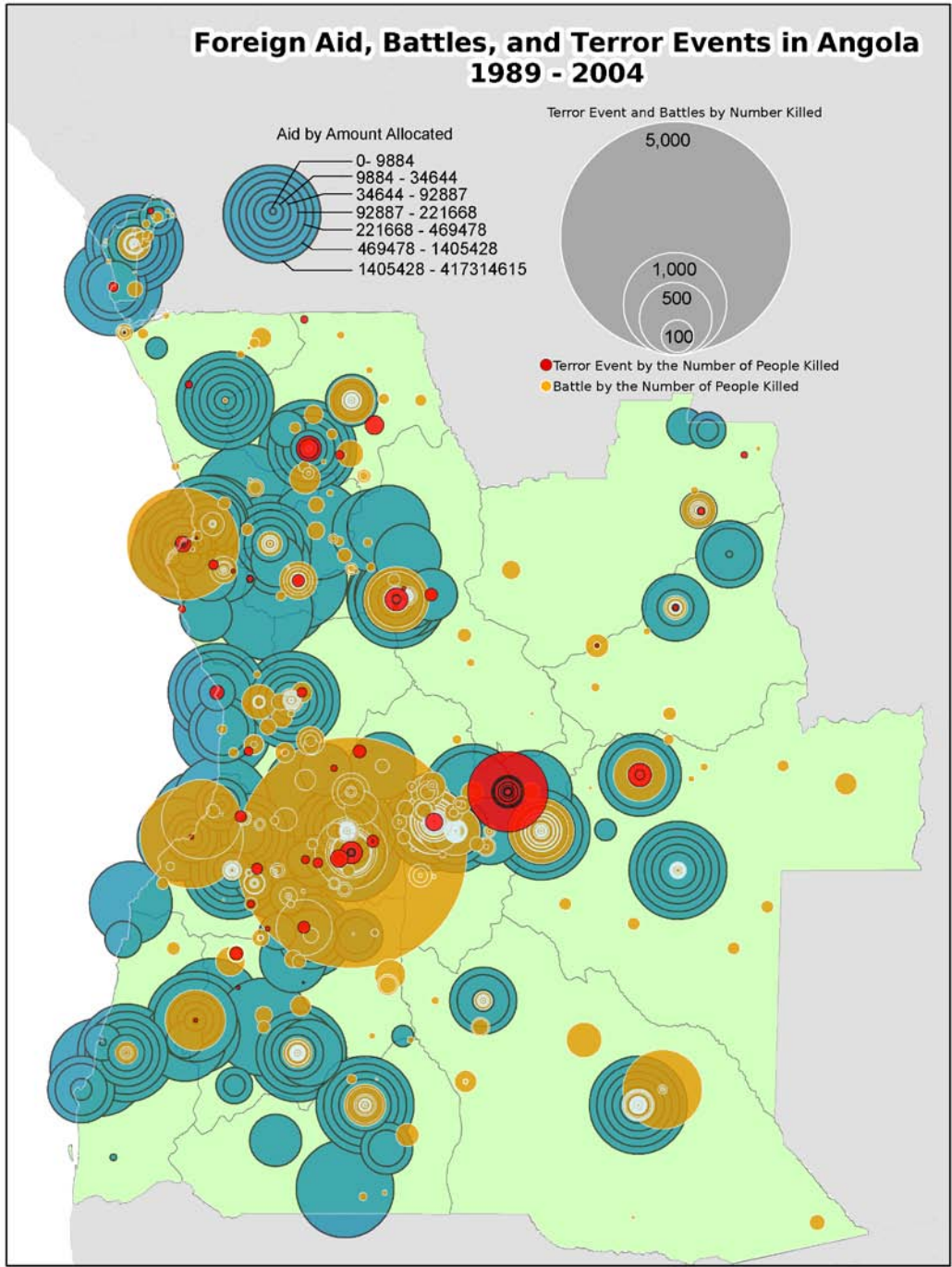


Figure 8: All foreign aid, battles, and terror events from 1989-2004 in Angola

Examining a single year in Angola (Figure 9) shows a similar clustering effect. In 2000, conflict and terror intensity were relatively low. However, when violent incidents did occur, they tended to fall within or close to areas of substantial foreign aid commitment. Indeed, there does not appear to be a single violent incident that occurred at a great distance from a clearly designated aid-receiving territory.

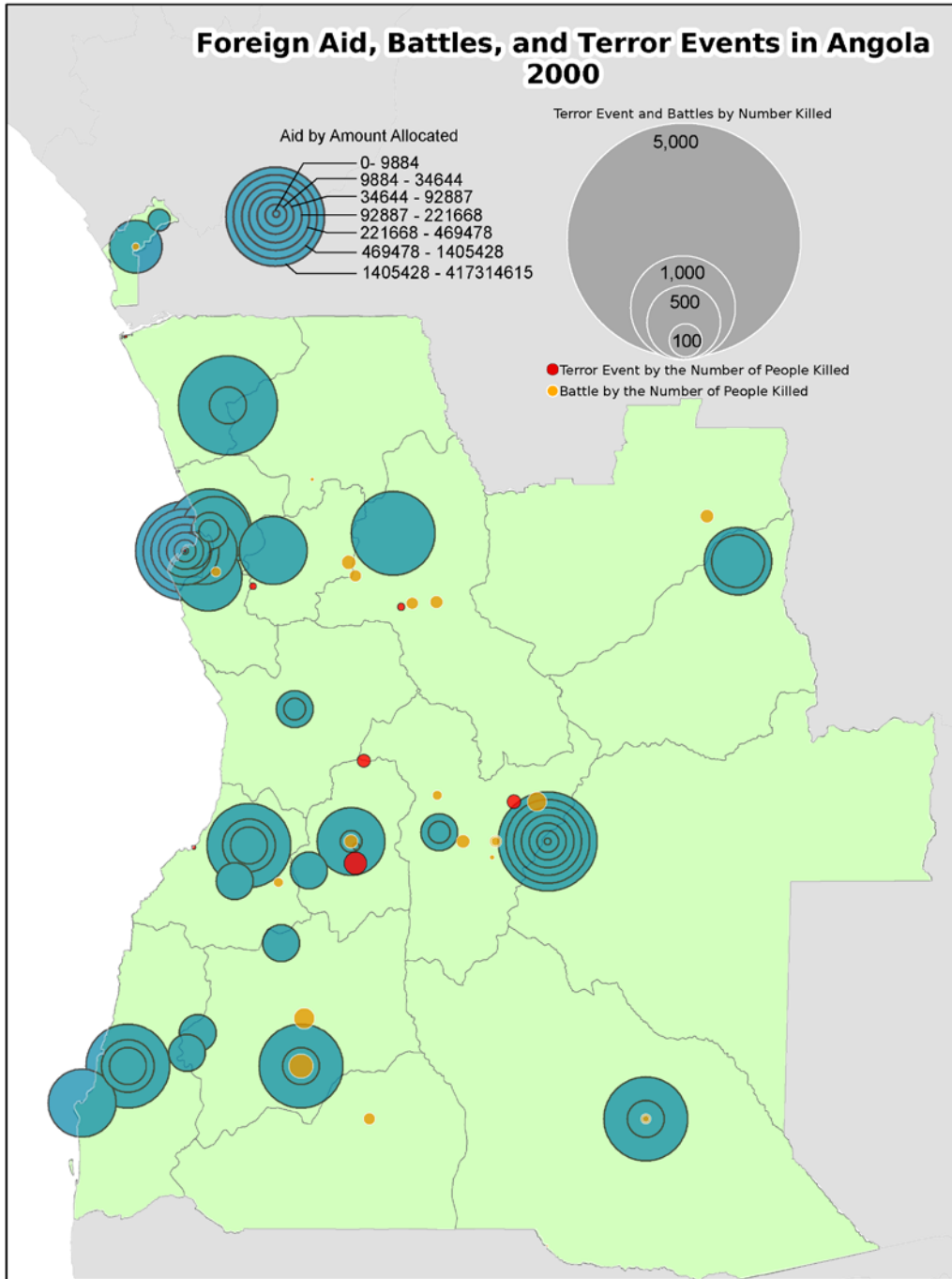


Figure 9: Foreign aid and violence in Angola during the year 2000.

Considering the amount of aid given to clear conflict zones year-by-year (Figure 10), it appears that the proportion of total aid that went to conflict zones saw a marked decrease from 1990-1994, with conflict zones receiving 57.33% of total aid in 1990, but only 5.512% of total aid in 1994.

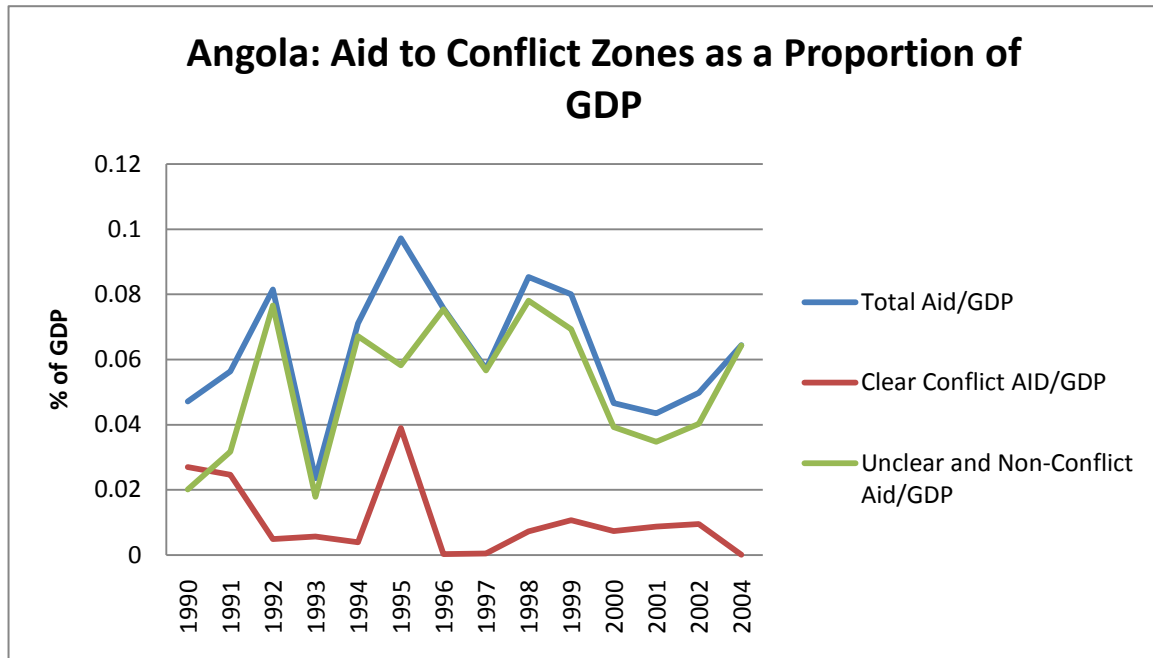


Figure 10: yearly levels of aid/gdp given to conflict zones and non-conflict zones. Note that many projects are unclear about location. Thus, we are conservative and lump that into non-conflict aid.

After 1994, a second clear trend can be found in donor behavior within Angola. Aid commitments begin to gradually recover from their trough of \$131.404 million in 1993, hovering around \$500 million for most of the following decade. However, the proportion of aid committed to conflict zones remains low, at or below 20% in every year except for 1995. Thus, it seems that donors continued to avoid committing funds to areas of Angola undergoing armed conflict.

Finally, from 2001-2004, foreign aid to Angola more than tripled from \$388.818 million to \$1.276 billion in 2004 as Angola's Gross Domestic Product more than doubled, from \$8.936 billion to \$19.8 billion over the same period. However, in spite of this steep increase in foreign aid, the conflict zones still received a relatively small proportion, including only .125% of total aid in 2004. It seems that donors dramatically altered their funding locations in reaction to the social upheaval during this time period.

One trend that is prevalent throughout Angola's experience with intrastate conflict is economic volatility. Angola has experienced changes in GDP of up to 48.46% in magnitude, changes of up to 125% of total aid, and even a change of 1141% in the amount of aid to conflict zones in 1995 (Nielsen, Findley, Davis, Candland, and Nielson 2010). Figure 11 displays the levels of aid to conflict zones and the number of battle deaths throughout Angola from 1990-2004. Interestingly, 1993 experienced both the highest level of battle deaths during the period and the lowest level of total aid commitments. Also, the general trend over time is an increase in overall aid accompanied by a steady decline in aid to conflict zones.

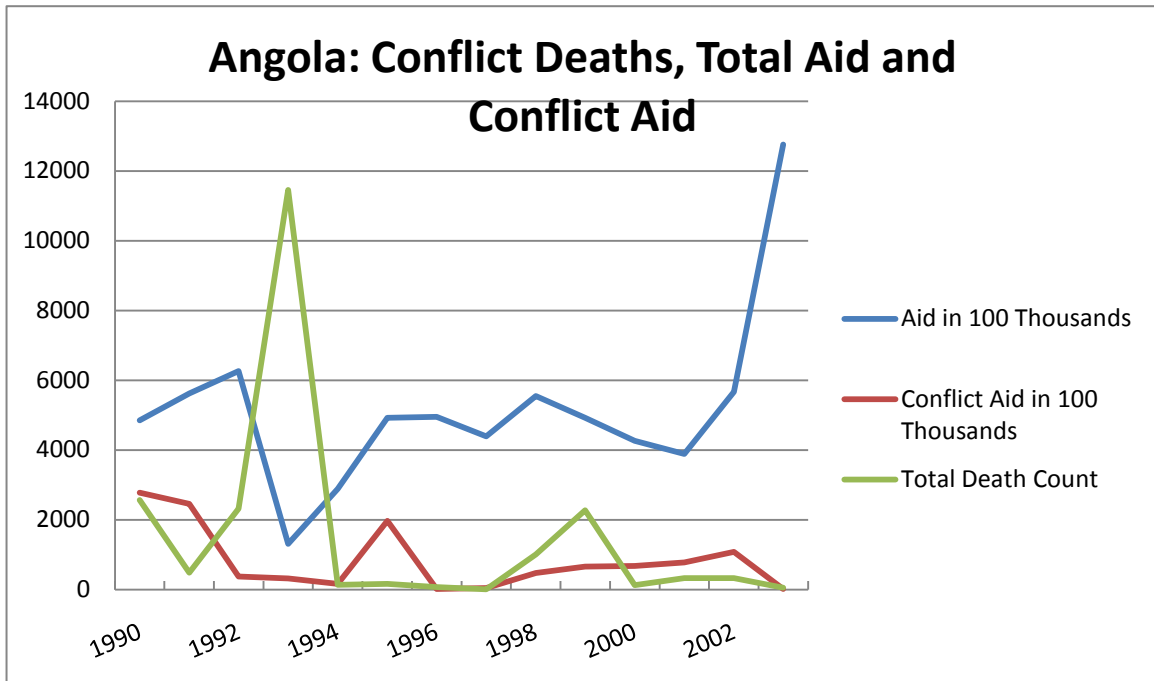


Figure 11: Aid and death counts in Angola from 1990-2002.

Aid and Conflict in Mozambique

By 1990, Mozambique had already experienced almost 15 years of Civil War, beginning in 1977. Through the period of 1990-1992, the intensity of conflict lessened significantly, leading to an end of hostilities in 1992. Figure 12 displays aid, battle, and terror locations, with larger circles indicating higher intensity of each. Even more so than in Angola, there seems to be significant clustering of aid and violent deaths within Mozambique. Throughout Mozambique, episodes of violence tend to occur within areas that receive high amounts of specified foreign aid.

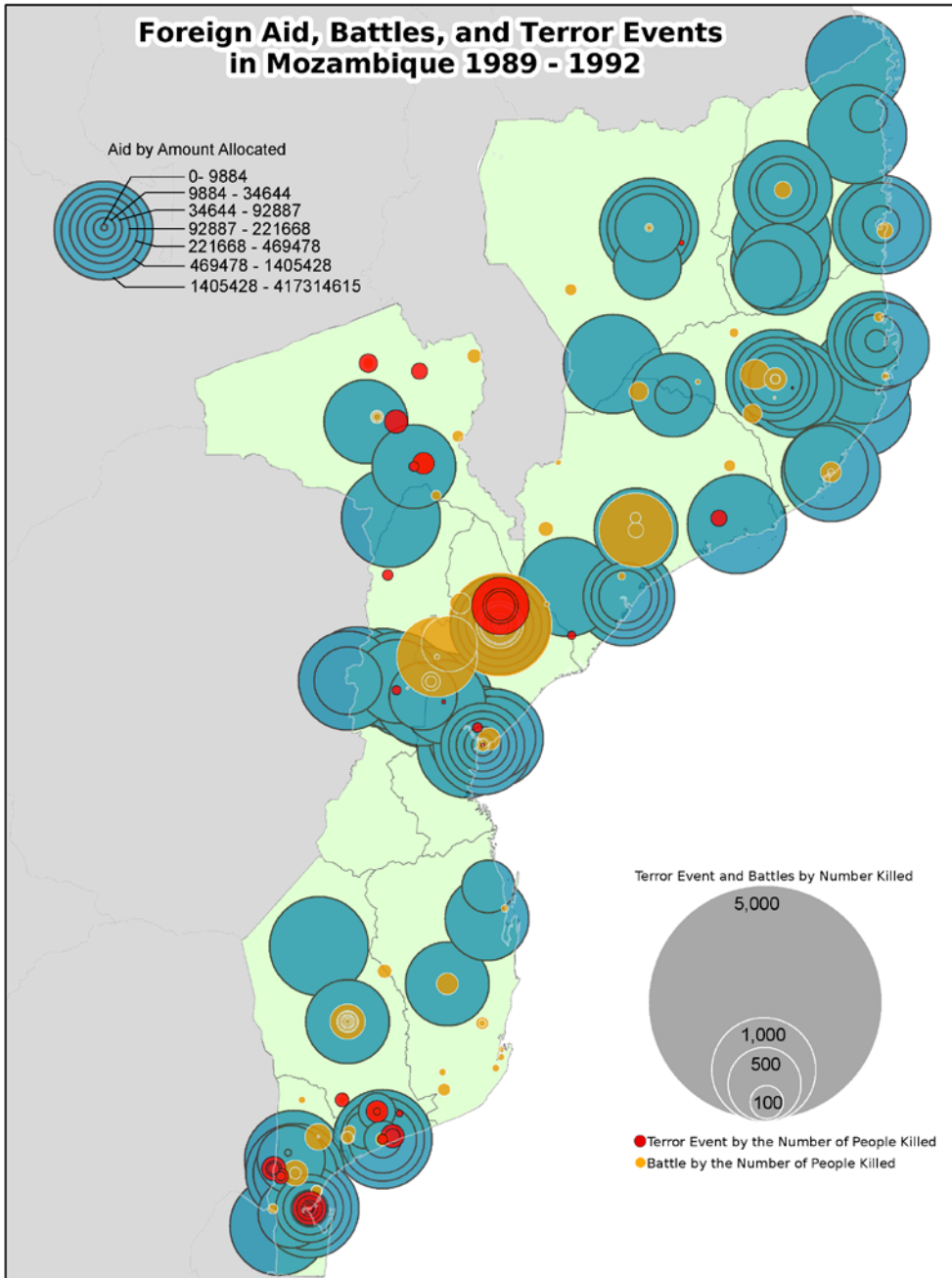


Figure 12: All foreign aid, battles, and terror events from 1989-1992 in Mozambique

An examination of 1989's locations of aid and violent deaths does not seem to show as strong of a clustering effect. However, the location relationship of the highest intensity of violence and aid appears consistent (see Figure 13)



Figure 13: Foreign aid violence from 1989-1992 in Mozambique

As in most conflict countries, GDP experienced a serious decline during this time, from \$2.536 billion in 1990 to \$2.071 billion in 1992. However, total aid increased dramatically during the end stages of Mozambique’s conflict, from \$1.005 billion in 1990 to \$2.450 billion in 1992. The 1992 level of aid represented 118% of Mozambique’s total GDP! (See Figure 14.)

A second striking pattern in donor behavior is evident in the end stages of Mozambique’s Civil War: while total aid increased dramatically during this three year period, the amount of aid committed to the conflict zones diminished substantially. In fact, the proportion of total aid/GDP definitively committed to conflict zones decreased from 26.9% in 1990 to only .77% in 1992. In both Angola and Mozambique, a seemingly consistent pattern of donor behavior emerges with total aid rising as conflict zone aid falls.

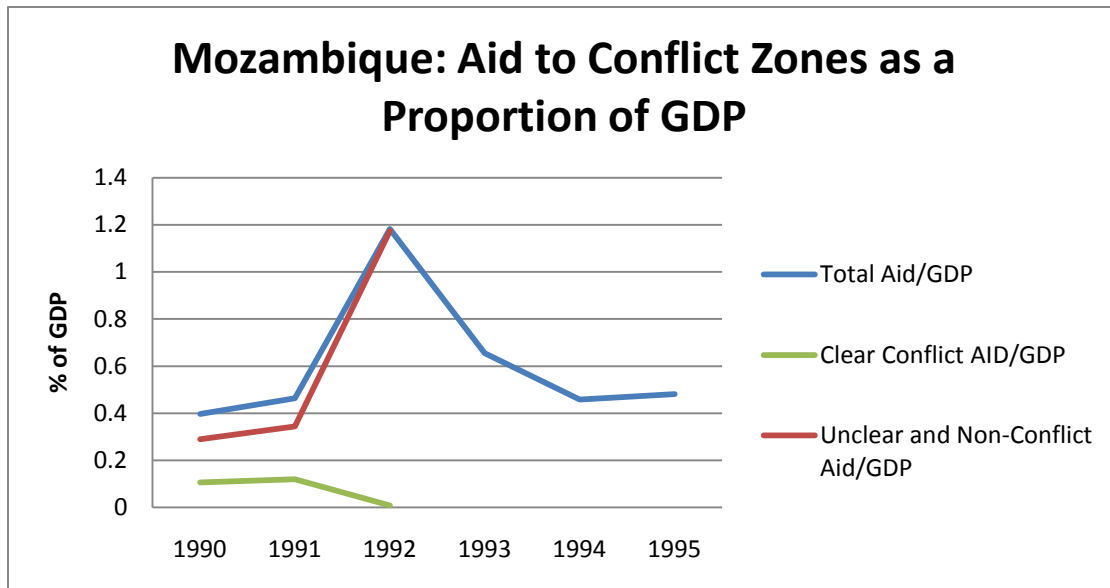


Figure 14: Aid to conflict and non-conflict zones in Mozambique during the war (1990-1992) and following the war for comparison (1993-1995)

Finally, as was seen in Angola, as the intensity of conflict decreases in Mozambique, donor commitments begin to rise dramatically. (See Figure 15.) Battle deaths saw a decrease of 80.87% from 1990-1992 as donor commitments rose by 143.67% over the same period. Two tentative relationships seem to be emerging from an examination of Angola and Mozambique. First, the duration of conflict seems to be negatively related with donor commitments to conflict zones. Second, as the intensity of conflict decreases, total aid to the country increases, although this does not seem to be the case for the conflict zones. However, these relationships could be peculiar to these two countries, and further examination of additional countries will be necessary to determine if the relationships hold universally.

Upon cessation of hostilities, total aid levels decrease to approximately their 1990 levels. It is interesting to observe that aid has substantial one-year spike that coincides with the end of violence within Mozambique. Further examination will be necessary to determine the level of aid allocated to former conflict zones post-conflict to assess the reconstruction efforts of donors.

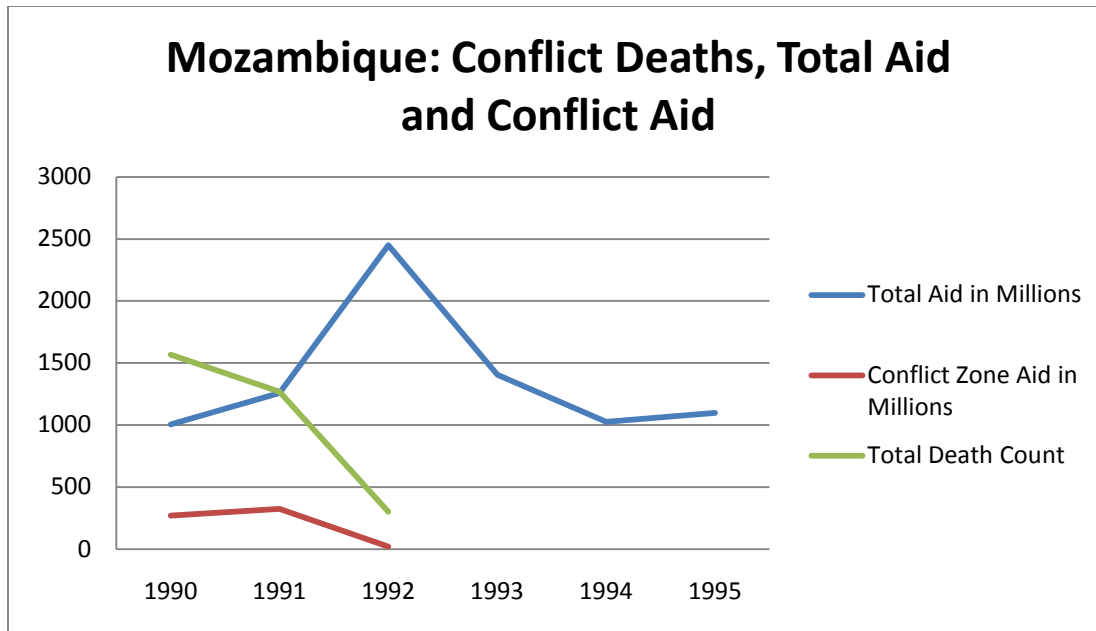


Figure 15: Aid and death counts in Mozambique from 1990-2002.

Conclusions

In this paper, we considered the relationship between foreign aid and armed conflict in Africa by disaggregating aid and conflict geographically. This is the first study of which we are aware that explicitly maps large numbers of individual projects alongside specific locations of battle and terrorism data. Although this initial foray has been only descriptive, the results suggest that aid and conflict are often closely associated, clustering in time and space. Further research will allow us to establish more precisely the directional effects.

We note a number of areas for further research. First, in this paper we did not attempt to identify causal relationships between aid and conflict. To think otherwise at this stage would be foolhardy. Because we use data on commitments in the same year as battles, if anything the relationship suggests that aid is responding to violence in certain conflict areas. Clearly

further research is needed to establish this. This leads to a second area of further research, ideally we need to code the geographic coordinates of aid disbursements. Of course, the disbursement data is extremely thin and most aid studies suffer from the inability to analyze disbursements.

Appendix: Precision codes

1 = The coordinates corresponds to an exact location, such as a populated place or a hill.

- The code is also used for locations that join a location which is a line (such as a road or railroad). Lines are not coded only the points that connect lines. All points that are mentioned in the source are coded.

2 = The location is mentioned in the source as being “near”, in the “area” of, or up to 25 km away from an exact location. The coordinates refer to that adjacent, exact, location.

3 = The location is, or lies in, a second order administrative division (ADM2), such as a district, municipality or commune.

4 = The location is, or lies in, a first order administrative division (ADM1), such as a province, state or governorate.

5 = The location can only be related to estimated coordinates, such as when a location lies between populated places; along rivers, roads and borders; more than 25 km away from a specific location; or when sources refer to parts of a country greater than ADM1 (e.g. “northern Uganda”).

6 = The location can only be related to an independent political entity, meaning the pair of coordinates that represent a country.

7 = Unclear. The capital is assumed to be one of two possible locations. (The other option is the country level, with precision 9.)

8 = The location is estimated to be a seat of an administrative division (local capital) or the national capital.

- If aid goes to Luanda without further specification on the location, and there is an ADM1 and a capital called Luanda, then code the coordinates of the capital with precision 8.

- If it is not spelled out that aid goes to the capital; but if it is clear that it goes to a government ministry or to government financial institutions; and if those institutions are most likely located in the capital; then the coordinates of the capital are coded with precision 8. (However, if it can be verified that the recipient institution is located in the capital then precision 1 is used.)

9 = Unclear. The location is estimated to be the country level (often paired with the capital, with precision 7)

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