H i C N Households in Conflict Network

The Institute of Development Studies - at the University of Sussex - Falmer - Brighton - BN1 9RE

www.hicn.org

Political Violence, Drought and Child Malnutrition: Empirical Evidence from Andhra Pradesh, India[1]

Jean-Pierre Tranchant[2], Patricia Justino[3] and Cathérine Müller[4]

HiCN Working Paper 173

April 2014

Abstract: We analyse the combined effect of political violence and adverse climatic shocks on child nutrition. Instrumental variable models using longitudinal data from Andhra Pradesh, India, yield two key results: (i) drought has an adverse effect on child nutrition in Andhra Pradesh only in violence-affected communities, and (ii) political violence has large negative effects on child nutrition through a reduction of the ability of households to cope with drought. FE-2SLS results are complemented by the use of a unique natural experiment created by a ceasefire in 2004. Results show that the eight months ceasefire period reversed the adverse effects of drought in communities previously affected by the conflict. Potential mechanisms explaining the strong joint welfare effect of conflict and drought are the failure of economic coping strategies in areas of violence and restricted access to public goods and services.

Keywords: Malnutrition, India, Drought, Naxal, Conflict.

JEL codes: I15, I30, O12, O15.

---

[1] Acknowledgements: This research received funding from the Integrated Project MICROCON (2007-2012) funded by the European Commission under the 6th Framework Programme, the European Commission's 7th Framework Programme under grant agreements nos. 237156 and 300676, and the ESRC-DFID funded project 'Agency and Governance in Contexts of Civil Conflict'. We would like to thank participants at HiCN's 7th and 9th Annual Workshops, the 'Agency and Governance in Contexts of Violent Conflict' International Conference at Northwestern University, and the CVD Seminar Series at IDS for their helpful comments. Jean-Pierre Tranchant wishes to thank Sandip Sarkar, Prem Chandra and Alakh Sharma for hosting him at the Institute for Human Development in New Delhi while working on parts of the paper.

[2] Email: jp.tranchant@ids.ac.uk

[3] Email: p.justino@ids.ac.uk

[4] Email: c.mueller@ids.ac.uk

1 Introduction

Households in developing countries have to cope with a myriad of uncertain events, some of which may happen simultaneously. One important example is the interplay between climatic shocks and violent conflict, which has received increasing attention in the last few years. Events such as the floods in Pakistan in 2010-11 and the 2011 drought-induced famine in east Africa raised awareness about potential interactions between political insecurity, economic vulnerability and the impact of natural disasters (Harris, Keen & Mitchell 2013). In the period between 2005 and 2009, more than 50 percent of people affected by natural disasters lived in conflict-affected countries. This number was around 80 percent in 2006 and 2008 (Kellett & Sparks 2012). Although the extent to which conflict and disasters interact differs across countries and contexts, in general, people living in fragile and conflict-affected states find it harder to cope with natural disasters given the impact of violence and instability on health, basic service provision, social cohesion, mobility opportunities and livelihoods (Buchanan-Smith & Christoplos 2004, Christoplos 2004, Eriksen & Lind 2009, Jaspars & O'Callaghan 2010, UNDP 2011).

Existing evidence on how individuals, households and communities cope simultaneously with violence and natural disasters is, however, largely anecdotic and descriptive. This is partially due to lack of data, but also to challenges in identifying empirical causal effects when endogeneity biases may be potentially large. The objective of this paper is to address this gap in the literature by analysing the combined effect of exposure to political violence and drought on child nutrition. The context of the analysis is the southern Indian state of Andhra Pradesh, which was for several decades affected by a left-wing (Naxal) guerilla insurgency. Households in Andhra Pradesh face in addition cyclical climatic shocks that affect the nutrition levels of their children, often quite severely (Krishna 2006).

The empirical analysis is based on the Young Lives longitudinal survey conducted in the state of Andhra Pradesh in 2002 and in 2006-07. We match this data to a conflict event dataset at the sub-district level (i.e. mandal) we have compiled. Our main identification strategy is based on two complementary approaches. First, we investigate the joint effect of conflict and drought on child nutrition outcomes using an instrumental variable approach that makes use of the fact that Naxal insurgents use forest cover in order to avoid detection from state troops. Second, we exploit a quasi-natural experiment in the form of a ceasefire that took place in Andhra Pradesh in 2004 to investigate further how violent conflict may interact with drought shocks.

We find that household exposure to drought in areas of violent conflict has strong long-term adverse effects on child nutritional outcomes. We find no evidence that exposure to conflict may affect child nutrition outcomes significantly on its own. These results are further strengthened by the finding that the ceasefire completely offset the adverse effect of climatic shocks on child nutrition in conflict-affected areas. This is a remarkable result given that the ceasefire lasted a mere eight months. Further analysis suggests that the adverse combined effect of conflict and drought on child nutrition outcomes may be explained by the levels of isolation faced by households in insurgency areas, which affect the portfolio of coping strategies available to them and restricts access to public goods and programs during periods of drought.

These results offer a new important contribution to a well-established literature in development economics on the welfare effects of covariate and idiosyncratic shocks (Dercon 2004, Dercon, Hoddinott & Woldehanna 2005, Christiaensen, Hoffmann & Sarris 2007). This literature has for its large part remained firmly within the economics domain, without much discussion as to how the determinants of household vulnerability and poverty, as well as the ways in which households cope with economic shocks, may depend on political constraints. Notably, political conflicts drastically change the institutional environment of contested areas (Justino 2012, Justino, Brück & Verwimp 2013). In this paper, we show in particular how political violence affects the ability of households to cope with other shocks due to isolation and fear leading to failures in common economic coping strategies and restrictions to the provision of public goods.

The paper complements also what amounts now to a substantial literature on the effects of political violence on human capital outcomes, including child nutrition. Overall, evidence shows that this impact has been largely negative (Akresh, Verwimp & Bundervoet 2007, Bundervoet & Verwimp 2005, Bundervoet, Verwimp & Akresh 2009, Guerrero-Serdan 2009, Minoiu & Shemyakina 2012) and persistent (Akbulut-Yuksel 2009, Akresh, Bhalotra, Leone & Osili 2012, Alderman, Hoddinott & Kinsey 2006, Domingues & Barre 2013). Most of these studies have suggested that the adverse effects of violent conflict on child nutrition outcomes may be largely caused by the inability of households to cope with second-order effects of the conflict, including the imposition of economic embargoes (Bundervoet & Verwimp 2005), famine (Alderman, Hoddinott & Kinsey 2006, Akresh et al. 2012), the spread of disease (Bundervoet & Verwimp 2005) and the rise of food prices (Minoiu & Shemyakina 2012). The precise identification of these mechanisms has remained elusive because it is usually difficult to clearly attribute the causal effects of conflict at the micro-level to precise wider institutional and economic changes that may take place simultaneously. Our paper complements this literature in that we are able to make use of both an instrumental variable strategy and a quasi-experiment to illustrate the causal effect of conflict on child nutrition outcomes through its impact on the ability of households to cope with adverse economic shocks.

Finally, the paper is also closely related to research on the peace dividend by Besley & Mueller (2012) and Abadie & Gardeazabal (2003). The first paper analyses the impact of the peace process in Northern Ireland on house prices and finds a positive peace dividend of between 1.3 and 3.5 percent. The authors are not able to identify precisely when Northern Ireland is at peace - which we are able to do in this paper - but make use of a theoretical model (Markov switching model) to provide a novel way of estimating the magnitude of economic peace dividends. The paper by Abadie & Gardeazabal (2003) estimates the economic costs of the terrorist conflict in the Basque country in Spain (in terms of GDP loses and stock market fluctuations) using a synthetic control region and making use of a natural experiment in the form of an ETA truce period. They find a positive effect of the truce on the stock value of firms that mainly operate in the Basque country. The novel contribution of our paper in relation to these two studies is our focus on the estimation of peace dividends in terms of long-term household welfare (of which child nutrition is a strong proxy), arguably a key element of peace and stability in conflict-affected countries.

The paper is organized as follows. Section 2 provides a brief description of the Naxal insurgency in India and in Andhra Pradesh. In section 3, we discuss the datasets and variables we use in the paper. The main results of the paper are presented and analysed in sections 4 and 5: section 4 discusses the FE-2SLS empirical estimates, whereas section 5 analyses the causal welfare effect of the ceasefire. We discuss potential mechanisms underlying our results in section 6. In section 7, we summarize the main findings and reflect on their theoretical and policy implications.

2 The Naxal insurgency in India and Andhra Pradesh

The Naxal movement, a left-wing Maoist-inspired insurgency, started in 1967 in the Naxalbari village in the Indian state of West Bengal. A young tribal man, who was entitled to a plot of land following post-independence land reforms in India, was attacked by a group of militiamen working for local landlords. Members of the tribal population retaliated and soon formed a widespread rebellion. The events led to the creation in 1969 of two parties professing armed struggle against the oppression of marginalized population groups. These were the Communist Party of India-Marxist-Leninist (CPIML) and the Maoist Communist Centre (MCC). The movement spread to various parts of the country, but soon collapsed as many cadres lost their lives or were imprisoned (Kujur 2008). In 1980, the People's War Group (PWG) was formed in Andhra Pradesh, and quickly became the dominant Naxal group in the state. In 2004, the PWG and the MCCI (Maoist Communist Centre of India), two of the principal Naxal armed organisations, merged to form the CPI-M (Maoist).

Despite its relative anonymity outside South Asia, the Naxal armed insurgency is a protracted and violent conflict where assassinations, kidnappings, and attacks against police and property are routine. According to the Indian Ministry of Home Affairs (2002, 2003, 2004, 2005, 2006), in the period between 2002 and 2006, the yearly death toll due to the Naxal conflict ranged from 482 lives in 2002 to 678 in 2006. As in most civil war-type situations, civilians pay a heavy price. On average, they accounted for 58% of all fatalities (2470 out of the 4283 deaths) between 2003 and 2008 (Ministry of Home Affairs quoted by South Asian Terrorism Portal: http://www.satp.org/satporgtp/countries/india/maoist/data_sheets/fatalitiesnaxalmha.htm). The conflict affected 79 districts in 9 states between 2003 and 2006. Between 2008 and 2012, an estimated 200 districts in India are considered affected the Naxal insurgency, creating a 'red corridor' ranging from West Bengal in the Northeast to Andhra Pradesh and Karnataka in the South.

Andhra Pradesh has been the centre of the Naxal insurgency since the earliest stages of the movement in the late 1960s. Andhra Pradesh used to account for a substantial amount of Naxal violence in India and its cadres were dominant within the Naxal committee[1]. According to official data, Andhra Pradesh represented between 20 and 34% of all Naxal-related incidents and fatalities in India between 2002 and 2005 (Ministry of Home Affairs 2002, 2003, 2004, 2005, 2006) . The state then gradually took the upper hand and the conflict abated, even though it intensified nationwide, especially in 2009 and 2011.

It is widely believed that the Naxal insurgency is stronger in regions characterized by low levels of human development, absence of state institutions and rough terrain (Borooah 2008, Government of India 2008). These various dimensions are interwoven as areas of rough terrain may affect negatively the capacity of the state to deliver development, are usually populated by disenfranchised sections of the population, such as scheduled castes (SC) and scheduled tribes (ST), and constitute a safe heaven for rebels. Despite their strong rhetoric, it is unclear how the Naxal movement has contributed to the support of vulnerable groups. Naxal groups are repeatedly accused of destroying schools, roads and other rural infrastructure much needed by the population they claim to protect, in an attempt to isolate the population from the state, facilitate recruitment and increase the distance between the rebels and state forces (Borooah 2008, UNESCO 2011). At the same time, the use of violence, or the threat of it, has allegedly helped agricultural labourers negotiate better wages with landlords, and led to the end of bond labour practices in the Telangana region of Andhra Pradesh during the 1970s and 1980s. The Naxal movement is also reported to help tribal populations encroach on forest and other traditional areas, protecting them against harassment by government officials, and to provide support and find shelter to tribal populations threatened by displacement (Government of India 2008). We explore this temporal and geographical variation in the Naxal conflict further in the

[1] According to *Times of India*, currently the CPI-M party has 17 members on its Central Committee of which 11 are from Andhra Pradesh. See http://timesofindia.indiatimes.com/city/hyderabad/AP-leaders-dominate-Maoists/articleshow/28611090.cms

empirical analysis below.

3 Data sources and variables

3.1 Conflict event data

For the purpose of this study we coded and collated information contained in a diary of Naxal-related events in Andhra Pradesh between 2002 and 2006 published online by the South Asian Terrorism Portal (SATP).[2] The diary provides a description of each violent event, the place where it occurred, the parties involved and the number of casualties associated with each event. We coded this information at the lowest possible level of aggregation (mandals).[3] It was not always possible to pinpoint the exact mandal because the SATP did not provide the information or because the event took place in a vaguely defined area, like a forest. In this case, we did not attribute the event to any sub-district entity: incidents were only included in the dataset if we were able to identify precisely the mandal where they took place. Although the SATP information has been used before at the district level (Borooah 2008, Vadlamannati & Khan 2010), this is the first ever attempt to code Naxal attacks in India at the mandal level.

In order to make sure that the SATP diary provides a fair picture of actual events, and does not introduce systematic biases, we cross-checked all events recorded by SATP against information published by Hyderabad edition of *The Hindu* newspaper. *The Hindu* is a widely respected national publication in India with an excellent reputation for reporting on issues of violence. The Hyderabad edition covers Andhra Pradesh in depth (Hyderabad is the state capital of Andhra Pradesh).

When using provincial or national newspapers to count conflict events, there is a risk that we may miss many of the smaller, predominantly rural, incidents that are important in the lives of people but fail to make the headlines (Barron & Sharpe 2005). In contrast, when using more local newspapers, it is difficult to assess the credibility and partiality of the information (especially on such a sensitive a topic). Likewise, comparing events of violence across different regions require us to compare information from different local newspapers, which may be problematic. We minimized these risks by using the Hyderabad edition of *The Hindu*, which we think offers the best compromise between the need for reliability and comparability and the need to capture local-level events. We retained in our database only events for which both sources coincided.

[2] The South Asia Terrorism Portal is a project launched in 2000 by the Institute of Conflict Management, based in New Delhi. SATP collates daily news and data on terrorism. http://www.satp.org/satporgtp/icm/index.html

[3] Mandals, which are known as *tehsils* in most of India, are the second layer of the local administration, above the gram panchayats and below the districts. Mandals in Andhra Pradesh are smaller than equivalent tehsils elsewhere in India. According to the census 2011 there are 1125 mandals in the 23 districts of Andhra Pradesh, i.e. each mandal comprises just above 75,000 people.

Figure 1 summarizes the types of violence and other Naxal-related events in Andhra Pradesh between 2002 and 2006. The dataset shows that the Naxal movement resulted in 189 attacks against people and 86 attacks against property during that period of time. Attacks against people resulted in 200 civilians killed and 103 injured. Most civilian targets include individuals suspected to act as informers to the police, politicians and state officials. Members of political parties (53) and officials (14) represent around a third of all civilian casualties. Over the same period, government armed forces led 139 assaults (also called encounters) against the Naxal insurgents, resulting in 273 deaths and 8 injuries among the insurgents. The toll for state forces over the period is 53 deaths and 39 injuries. These fatalities figures are close to those provided by the Ministry of Home Affairs: our database includes 558 fatalities over the whole 4 years-period, whereas the corresponding government estimate is 564 (Government of India Various years).

Figure 2 shows a map of the geographical distribution of Naxal activities at the mandal level. We coded a mandal as conflict-affected if that mandal witnessed at least one Naxal-led attack or one encounter by the police against the Naxal rebels. The map reveals four main areas of Naxal presence. The first one is a circular area centred around the Karimnagar district and covering parts of Karimnagar, Adilabad, Nizamabad, Medak and Warangal districts. The second area, contiguous to the first, is located along the border of Andhra Pradesh and the state of Odisha, and encompasses all the north-eastern mandals of the Warangal district, the north-western mandals of Khamman and the northern mandals of East Godavari and Vishakaptnam. The third area is at the confluence of Mahboobnagar, Nalgonda, Guntur, Prakasam and Kurnool districts, and roughly correspond to the Nallamala hills. The fourth area lies in the south-western part of the state, covering large parts of Anantapur and Cuddapah districts.[4]

Two important facts are revealed by the mapping exercise. First, we notice that Naxal presence is clustered geographically, a fact that coincides with journalistic accounts and lends credibility to the data. Second, the mapping exercise shows that measuring Naxal activity at the district level could be misleading as the actual areas of Naxal activity cut across district boundaries and is not homogeneous within districts. Mapping Naxal activity at the mandal level offers therefore a much better representation of the spatial dimension of the conflict.

3.2 Nutrition and drought exposure data

The data on child nutrition was collected as part of the Young Lives longitudinal survey conducted in the state of Andhra Pradesh in 2002 and in 2006-07 [5]. The surveys follow

[4] Cuddapah appears as YSR on the map.

[5] Young Lives is an international study of childhood poverty, involving 12,000 children in 4 countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with

around 2,000 young children, who were on average around 12 months old at the time of the first round, and 1,000 older children, who were about 8 years old in 2002. The datasets contain very rich information on child development, economic shocks (of which drought is the most prevalent) and household responses to shocks. The empirical analysis in this paper focuses on the younger cohort.[6]

Our main dependent variable is the height-for-age z-score (HAZ). The HAZ is obtained by taking the difference between the height of a given sampled child and the median of the height of a reference population of children of the same age divided by the standard deviation of height-for-age in the reference population. Height-for-age z-scores below -2 standard deviations are a sign of chronic malnutrition, and children are said to be stunted. The height-for-age z-score is a long run indicator of child health (Hoddinott et al. 2013). We also estimate weight-for-age z-scores (WAZ), an indicator that reacts to more short-term changes in nutrition.

Statistics on child nutrition indicators of the younger Young Lives cohort are displayed in table 1. In the sample, children were on average 0.89 and 1.7 standard deviations shorter than the reference population in 2002 and 2006, respectively. The proportion of stunted children increased from 22 to 30% over the period, as did the proportion of wasted children (whose WAZ is below -2 s.d) (from 32 to 47%). The fact that malnutrition indicators have gotten worse over time is a sign that children were subject to chronic nutritional deficiencies between the ages of 1 and 5 years.

The data on household exposure to climatic shocks was also collected by Young Lives. Over 68 percent of India is vulnerable to droughts, and Andhra Pradesh is one of the three largest drought-prone states in India. The eight districts particularly vulnerable to drought in Andhra Pradesh are Anantapur, Chittoor, Cuddapah, and Kurnool in the Rayalaseema region; Rangareddi, Mahboobnagar, and Nalgonda in the Telangana region; and Prakasam in Coastal Andhra. Together, they account for about 70 percent of the state-wide crop production loss due to drought (Lvovsky 2006).

Table 2 shows the proportion of households in the Young Lives datasets that report experiencing drought between 2002 and 2006, and the extent to which drought was covariate or idiosyncratic, across districts. Over 80% of rural households located in Anantapur district, the driest district in the state, reported that they suffered from drought. The incidence of drought is also high in the Mahboobnagar district (45.1%), the other district alongside Anantapur to be officially considered drought-prone (World Bank 2006, PACS 2008). At the other end of the spectrum, drought is rare in West

research and policy partners in the 4 study countries: Ethiopia, India, Peru and Vietnam. More information can be found online: `http://www.younglives.org.uk`

[6]We cannot control for shocks that could have affected the development of the older cohort in the early stages (first four years) of their lives. As this might lead to serious biases in our estimations, we focus only on the younger cohort for who we have these information.

Godavari, which lies by the coast and where normal rainfall is higher than in arid or semi-arid regions. In the other districts, drought prevalence ranges between 15 and 25%.

The last column of table 2 displays the prevalence of drought measured at the village level for all districts. This variable was collected in the community survey of Young Lives and takes the value 1 if interviewed community representatives report unanimously that a drought affected their villages between 2002 and 2006. The variable takes the value 0 otherwise. We use this variable in subsequent analyses rather than the household self-reported drought variable because drought defined at the village level is likely to provide a more exogenous measure of exposure. We posit that, the household self-reported measure is bound to incorporate an element of vulnerability to drought in addition to that of pure exposure whereas the village-level measure is more likely to relate to the official declaration of drought. According the village-level variable, droughts are very prevalent in Rayalaseema: Anantapur and Cuddapah districts record 100 and 55% of drought-affected villages, respectively;, and in Telangana: Karimnagar and Mahboobnagar districts record 100 and 76% of drought-affected villages, respectively. In Coastal Andhra Pradesh the situation is more heterogeneous: no village in West Godavari are drought-affected but almost half of the villages in Srikakulam district is. The conversion between the prevalence of droughts measured at the village-level and that at the household level is rather weak. While Anantapur and Karimnagar display the same prevalence of drought at the village level (i.e. 100%), the proportion of affected households is more than three time higher in the former (80% vs 25%). The correspondence between the two measures is also stronger in Mahboobnagar than in Cuddapah, Srikakulam and West Godavari. The most likely explanation for the discrepancy is that vulnerability to drought, which is proxied by the household-level measure, is very heterogeneous across the sample so that a similar exposure to drought can generate vastly different impacts in different parts of the sample. It is worth noting that among the mandals in the sample, the Naxal presence is strongest in those in Anantapur and Mahboobnagar, two districts where high prevalence of drought at village-level translates into high proportion of affected households, and much weaker in those in Karimnagar, Cuddapah and Srikakulam: districts where the household-level measure of drought yields much lower figures than the village-level one.

4 Empirical strategy I: FE-2SLS model

We combine panel data on child anthropometrics provided by the Young Lives datasets with the violence event dataset we have constructed in order to estimate the effect of drought on child nutrition outcomes in communities affected by the Naxal conflict in Andhra Pradesh. This analysis is done in two steps. We start by examining, in section 4.1, the direct effects of drought and conflict on child nutrition outcomes. This will provide us with a useful set of benchmark estimates that we will use in section 4.2 to compare with the impact of the interaction between conflict and drought.

4.1 Direct effect of conflict and drought on child nutrition outcomes

The structural equation we wish to estimate is as follows.

$$HAZ_{ihvt} = \beta_1 D_v + \beta_2 I_{hv} + \beta_3 (C_m \times \eta_t) + \beta_4 X_{ihvt} + \mu_{ih} + \eta_t + \epsilon_{ihvt}, \quad (1)$$

where HAZ_{ihvt} is the height for age z-score of child i, in household h, in village v at time t, D_v is a binary variable indicating whether the child i who lived in village v was exposed to a drought over the last four years, I_{hv} is a binary variable indicating if someone in household h went through a major illness over the last four years. This variable is included for two reasons. First, illness is the second most common shock suffered by households in the sample. Second, and more importantly, illness is an idiosyncratic household shock positively correlated with drought. While illness affected 4.7% of households in villages which did not experience a drought, the rate of affected households jumps to 27.9% when a drought occurred. This correlation may stem from a common vulnerability to both shocks or because droughts strain economic, physical and moral resources of households to such an extent that it favours the likelihood of illness. Therefore, its non-inclusion as a control variable would have led us to potentially overestimate the effect of drought. X_{ihvt} is a vector of relevant child, household and village levels characteristics, μ_{ih} is a household-child specific effect which captures both the genetic potential of growth of the child and unobservable household determinants of child nutrition, η_t is a time fixed effect that absorb all context variables common to all children and ϵ_{ihvt} is an i.i.d error term.[7]

Our parameters of interest are given by $\beta_1 D_v$, which indicate whether children who experienced a drought in the previous four years are shorter than their peers, and $\beta_3(C_m \times \eta_t)$, which indicate whether children who grew up in conflict-affected mandals between 2002 and 2006 have had a different nutrition trend over this period than children who grew up in peaceful mandals. The variable of conflict C_m does not vary through time so that it drops when we estimate equation 1 with children fixed effects. Yet, the presence of conflict can have a cumulative effect on child nutrition, which we capture through the interaction of C_m with the time effect η_t in the regression. In the tables of results, the variable corresponding to the time effect η_t will be reported as "Round".

We restrict the sample to households that did not move over the 2002-2006 period in

[7]There is a drought variable in both the household and community surveys of the Young Lives project. The subsequent analyses mostly exploit the latter, hence the use of the village index v for the drought variable.

order to make sure that there is a correspondence between the village-level variable of drought and the actual experience of children. For households that moved, we do not know the timing of the move and thus we cannot infer from the variable of drought the actual drought experience of their children.

Since the variable of drought is measured at the village level, we cluster the standard errors at the village-level when estimating equation 1 to correct for the fact that the error terms are not i.i.d.

4.1.1 Endogeneity and IV approach

As discussed in section 2, it is believed that the Naxal conflict predominantly takes place in poor, remote areas (Borooah 2008). Naxal groups also purposively target marginalized (especially tribal) populations for recruitment (Government of India 2008). Given these facts, estimating equation 1 using fixed effects would not be enough to retrieve the causal impact of growing up in a conflict-affected mandal on child nutrition outcomes. These estimations would overestimate the true impact of conflict if children in conflict-affected mandals are poorer, even without being exposed to conflict.

Available data in Andhra Pradesh does not suggest that Naxal mandals were particularly less likely to receive public goods than non-Naxal mandals. In fact, according to the Young Lives data, a higher proportion of households reported accessing paved roads, drinking water and sewerage in 2002 in Naxal mandals than in non-Naxal ones. Yet, it remains plausible that the quality of the public good (including staffing and equipment) is lower in conflict areas.

We propose to address this potential endogeneity bias by instrumenting the presence of conflict in a mandal with the extent of its forest cover. Instrumental variables need to fulfil two main requirements: they must be able to explain a sizeable variation of the endogenous variable, and they must influence the main dependent variable (HAZ) only through their effect on the endogenous variable (conflict). The share of forest cover variable fulfils these two requirements as follows. First, in asymmetric conflicts such as the Naxal insurgency, insurgents tend to operate from remote hideouts in rough terrain where their superior knowledge and agility may offset their numerical disadvantage (Hirshleifer 2001, Fearon & Laitin 2003). In India, the Naxals have historically concentrated in areas of dense forest where they can hide from the state and where the state military cannot deploy large-scale forces. The early Naxal forces, as well as the later formed organizations such as the PWG and the MCCI, have used contiguous forests areas to create bases from which they could operate and expand in all affected states (Mitra 2011).

Figure 3 displays the map of forest cover in Andhra Pradesh. Comparing this map with that of figure 2 reveals a striking correspondence between the forested mandals of Andhra Pradesh and those where the Naxal conflict has been present between 2002 and

2006. It also shows that areas that have experienced violent events during that time are not restricted to the densest forest areas themselves but expand to adjoining areas. This is consistent with the evolution of Naxal presence in a given area as described by Mitra (2011), as well as with the Naxal tactical strategy as explained in their Strategy & Tactics document from Central Committee (Central Committee 2004).

The first stage IV regressions shown in tables 5 and 6 confirm the strong explanatory power of forest cover for the presence of conflict. The results show that the share of forest cover is a very strong instrument as evidenced both by the Fischer tests - the coefficient of the instrument is zero (which massively reject the null) - and the partial R^2 (between 30 and 40%) of the instrument. Both the F statistic and the partial R^2 are considerably above the recommendations of Stock, Wright & Yogo (2002). All other weak instruments tests are emphatically rejected.

In addition to being strongly related to the endogenous variable, the candidate instrument must also satisfy the exclusion restriction. In other words, the share of forest cover in a given mandal should influence children nutrition through its impact on conflict alone. Regressions will control for demographic and economic characteristics of households and villages, which might systematically differ in forest and non-forest areas (e.g. land owning, wealth, household size, exposure to shocks). Yet, it is likely that there will still be unobserved characteristics of children and villages living in densely forested mandals that make children more prone to malnutrition. In that case, the instrument would still exert an independent impact on nutrition and would not be valid.

In our case, the IV approach will be implemented within a panel data setting so that we can combine the instrumentation with the use of fixed effects. The fixed effects absorb all time-invariant factors that may be correlated with both the density of forest and nutrition, such as remoteness, agricultural yields, institutional quality or population composition. This strategy ensures that the most plausible independent effects of the instrument are controlled for, either by adding the appropriate controls in equation 1, or through the fixed effects.

It is still possible that forest areas, which are prime areas of rebel influence, were prioritized by the state for the delivery of public goods between 2002 and 2006 in order to break the support of tribal populations toward the Naxals. The federal and state strategies against the Naxals is two-pronged and reminiscent of the"winning hearts and minds" counterinsurgency strategies that combine intense repression with development efforts in the zones most likely to support the rebels. Hence, the state might have invested in public goods in areas of strong forest cover and therefore improved the nutrition standards of children living in forest areas. To alleviate this concern we include as additional controls a set of dummy variables which indicate whether particular public goods, such as irrigation of agricultural land, drinking water and sewerage facilities, have been provided between 2002 and 2006.

We have also strong additional indirect evidence on the validity of forest cover as an instrument for conflict. Because the height-for-age z-score is a cumulative measure of nutrition, it reveals information about the past living conditions of children. If, in 2002, when the children were one year old, the HAZ in densely forested mandals were already significantly lower than those in non-forest mandals, this would cast doubt on the validity of the exclusion restriction. This is not the case. Figure 4 depicts the statistical relationship between forest cover and HAZ in 2002 and its non-parametric best fit. The relationship is positive over most of the sample and becomes negative at the very high end of the distribution of forest cover. Although the relationship is curvilinear, the mean of HAZ at high density of forest never drops below its corresponding level in non-forest mandals. A regression analysis of HAZ in 2002 on the share of forest cover and the square of the share of forest cover plus all the controls used in subsequent analyses yields coefficients of 3.95 and -5.21, respectively, and both are significant at 1%.[8] The regressions estimates predict that HAZ will be 0.4 and 0.3 standard deviations higher in mandals with 12% of forest cover (corresponding to the 75^{th} percentile) and 70% (corresponding to the most forested mandal) than in non-forested mandals, respectively. The maximum effect of forest, 0.75 s.d., is reached for mandals with 38% of forest cover. The relationship between the share of forest cover and WAZ is monotonically positive and flatter than for HAZ. These results indicate that very young children in forested mandals appear to be better-off than their peers in non-forest ones. We are therefore able interpret any negative impact of conflict (instrumented by forest) of malnutrition in subsequent regressions as a lower bound of the true impact.

4.1.2 Empirical results

The results of the FE-2SLS estimation of equation 1 are shown in columns (1) to (3) in table 3. The first specification does not include any controls except the time period. The second specification adds a series of demographic and socio-economic time-varying covariates of children and households from the YL data. The specification includes in particular two variables indicating whether any household members are registered with the National Rural Employment Guarantee Scheme (MNREGS) and/or the midday meal scheme (MDM). These programs were introduced over the period of interest and are included in order to control for their potentially beneficial effect on child health.[9] Column (3) introduces village-level public goods provision controls (share of cultivated land that

[8] The table of results is not shown to save space but is available upon request.

[9] Evidence for this positive effect is reported in Singh, Park & Dercon (2014), who show that MDM offsets the negative nutritional impact of drought on children, and in Dasgupta (2013), who presents evidence on the use of the MNREGS by households to cope with rainfall shocks.

is irrigated, and whether drinking water and sewerage facilities were provided during the period).

In all specifications the interaction of the time period and presence of conflict (instrumented by forest cover) cannot be distinguished from zero. Other covariates display the expected sign. HAZ in 2006 is about 0.4 standard deviations lower than in 2002 ($p < 0.01$). Drought reduces HAZ by between 0.38 s.d. ($p < 0.01$, without household and community specific controls, column 1) and 0.25 s.d. ($p < 0.1$, when all controls are included, column 3). Neither illness nor other relevant economic variables are statistically different from zero. [10]

Table 4 reproduces the same analysis using the weight-for-age z-score (WAZ) as the independent variable. WAZ is a short-term indicator of malnutrition and, as such, it is less likely to be influenced by shocks that occurred further in the past. It is not surprising then that neither drought nor illness are statistically significant in table 4 given that only 10% of children who experienced drought experienced it within the last 12 months of the survey. In contrast to the HAZ results, we find that the presence of Naxal-related violence reduces WAZ, and that this effect is very precisely estimated (at the 1% level). The magnitude of the effect ranges from -0.38 s.d. without any controls (column 1) to -0.53 with the full list of controls (column 3). This suggests that there is a direct effect of living in a conflict-affected area. Given that WAZ is a short-term nutritional indicator, we assume that these effects are being driven by violent events that occurred towards the end of the period 2002-2006. 2005-06 corresponds to a period of intense police crackdown on the rebels that would eventually virtually eradicate the Naxals from Andhra Pradesh after 2006. In 2006, we coded 38 instances of Maoist attacks on people and/or property and 47 encounters led by the police against the rebels. In 2005, we observed 81 attacks and 42 encounters.[11]

4.2 Joint exposure to conflict and drought

In this section, we estimate the following equation in order to capture the joint effect of conflict and drought:

$$\begin{aligned} HAZ_{ihvt} = \; & \beta_1 D_v + \beta_2 I_{hv} + \beta_3 (C_m \times \eta_t) + \beta_4 (D_v \times C_m) \\ + \; & \beta_5 (I_{hv} \times C_m) + \beta_6 X_{ihvt} + \mu_{ih} + \eta_t + \epsilon_{ihvt} \end{aligned} \tag{2}$$

[10] Illness is marginally statistically significant in column 1 but its effects disappear once controls are added to the regressions. Each additional child below 5 years old in a given household also generates a small burden on HAZ (0.007 s.d., $p < 0.1$).

[11] Similarly to the HAZ results, most of the other covariates are not statistically significant. There is some indication that the Mid-Day Meal school program increases WAZ by 0.1 s.d. but the effect is not robust to the inclusion of village-level controls.

The full impact of conflict is given by the sum of the direct effect ($\beta_3 \times \eta_t$) and the two interactions between conflict and economic shocks ($\beta_4(D_v \times C_m)$) and ($\beta_5(I_{hv} \times C_m)$). The coefficient associated with the direct effect ($\beta_3 \times \eta_t$) indicates how much HAZ (or WAZ) differs in mandals affected by the conflict with respect to peaceful mandals. The interaction terms $\beta_4(D_v \times C_m)$ and $\beta_5(I_{hv} \times C_m)$ should be interpreted as the differentiated impacts of drought and illness, respectively, in conflict-affected mandals with respect to peaceful mandals. The full impact of conflict is given by the sum of the direct effect and the indirect effects that operate through drought and illness. The illness shock is included in the equation for the reasons discussed in the previous section. In the tables of results, the direct effect is reported as "Round x violence" and the indirect ones as "Drought x violence" and "Illness x violence".

The instrumentation remains unchanged with respect to the previous analysis except that there are now three endogenous variables (the interactions of conflict between the time period, drought and illness) and three instruments (the interactions of the share of forest cover between the time period, drought and illness). The three instruments are distinct but collinear (because all are based on the same excluded variable) which is why, in columns (4) to (6) of tables 5 and 6 which show the first stage regression results, two of the interactions are sometimes jointly significant in explaining one endogenous variable. Nevertheless, it is the interaction between forest and drought that explains most of the variation in the interaction between conflict and drought while the other instruments are at best weakly associated with the latter. This is true for all three endogenous variables.

Results for HAZ are displayed in columns (4) to (6) of table 3. The interaction between conflict and the time period continues to be statistically insignificant, but the interaction between conflict and drought is strongly negative. The magnitude and precision of this coefficient increase with the gradual introduction of controls. In the specification with all the controls (our preferred specification), the estimated impact of conflict and drought is -1.4 s.d., a very large and statistically significant effect (at the 1% level). Conversely, the standalone coefficient of drought becomes indistinguishable from zero in columns (5) and (6) just when the interaction between conflict and drought becomes significant. This result strongly suggests that drought has no significant adverse effect on child health in peaceful communities.

The upshot of these results is twofold. First, we find that the Naxal insurgency in Andhra Pradesh exerts a long term impact on child nutrition, but only indirectly, through the combination of conflict with drought. Second, we observe that drought has a strong negative impact on child nutrition, but only when it occurs in a violent environment.

Results for WAZ are shown in table 4. The two newly introduced interaction terms are not different from zero and the estimation of the interaction between time period and violence is not affected with respect to columns (1)-(3) (the coefficient remains around

-0.5 s.d, $p < 0.01$). These results are consistent with the fact that WAZ should not reflect shocks that occurred long in the past. HAZ, which is a long term measure of malnutrition, is in contrast credibly affected by past events. Taken together, these results show that the Naxal conflict has substantial direct effects on child nutrition in the short-term. Its long-term impact (on HAZ) operates solely in conjunction with the drought shock.

As a robustness check, we replicate the analysis in tables 3 and 4 by replacing the drought indicator with a measure of severe drought. We define severe droughts as droughts equal or above the median in terms of a severity metric. We measure drought severity by the ratio of the number of people in the village affected by droughts to the total population in the village. The first term of the ratio is taken from the community survey, which asked village respondents to estimate the number of people affected by drought. The range of severity is quite large (from 3 to 25%) which reflects the heterogeneous pattern reported in the household responses shown in table 2. One might argue that comparing droughts that affect three percent of the community population with those that affect 25 percent might result in biased results as households might have very different opportunities to benefit from informal coping mechanisms if the exogenous shock was more idiosyncratic than covariate. Another concern is related to the possibility that the definition of drought followed by community representatives may not be consistent across all communities. Restricting the analysis to severe droughts is therefore useful to check that our previous analyses were not affected by these potential measurement errors. Results are shown in tables 7 (for HAZ estimations) and table 8 (for WAZ estimations). These show that the estimated impact of the interaction term remains significantly negative, which validates further our previous results. We investigate further the plausibility of our findings discussed above in the next section, where we exploit a unique natural experiment in the form of a ceasefire that took place in Andhra Pradesh in 2004.

5 Empirical strategy II: Nutritional effects of drought during ceasefire

After a long period of intense fighting, a ceasefire was agreed in 2004 between the state government of Andhra Pradesh and the Naxal movement to allow for peace negotiations, including key discussions around land redistribution. The truce formally started on the 16th June 2004, on the eve of peace talks to be held between the two parties. The ceasefire was officially ended on 4th April 2005, following the breakdown of talks and the return to fighting and attacks from both parties. The ceasefire was a direct result of a change in political leadership when the Congress and Telangana Rashtriya Samiti

(TRS) parties won the state elections in May 2004 and engaged in peace talks with the Naxal leadership (Balagopal 2005). The truce was to be continued for the duration of the talks. As a token of its commitment to the peace process, the state government lifted a 6 year-old ban on the People's War Group (which was placed on the list of terrorist groups and banned from operating in India) on the 21st July 2004. The prospect of the peace talks caused violence to stop straight after the announcement of the election in May 2004, as a token of goodwill before the ceasefire officially kicked-in. One round of talks took place on the 15th October 2004, after which the peace process started to falter. Violence resumed immediately, even though the end of the peace negotiations was only announced on 4th April 2005. The following months were characterized by a severe military crackdown against the Naxals. [12]

Fighting stopped almost completely between May and December 2004 and Andhra Pradesh experienced an unprecedented period of complete absence of violence throughout most of 2004 (see figure 1). This period of truce provides a unique natural experiment to analyse the effect of peace on human capital outcomes in Andhra Pradesh. Importantly for our identification strategy, the ceasefire originated from a promise of the Congress Party to hold peace talks if it won the elections in Andhra Pradesh. This electoral campaign promise was a response to growing frustration among voters with ongoing violence from both Naxal and government forces. The Congress Party reckoned (correctly, given the positive election results) that voters would reward commitment to initiate peace negotiations and end violence (Balagopal 2005, Kannabiran, Kannabiran & Volga 2005). Civil society efforts to bring the Naxals and the authorities to the negotiation table had been ongoing for years in an attempt to stop the conflict (Balagopal 2005). Once the Congress Party won the elections in May 2004, both parties stopped armed hostilities in a show of goodwill in advance of the official truce signed one month later (Kannabiran, Kannabiran & Volga 2005).

In figure 5, we show incidents on a timeline between January 2002 and December 2006. Each vertical line depicts one event, with darker areas showing times of more intense fighting. Figure 5 shows clearly that during the period between the elections in May 2004 and up to early January 2005, when the newly created CPI-M decided to resume hostilities, Andhra Pradesh witnessed an unprecedented spell of peace. In fact, with the exception of a spike in number of violent events just before the May elections, and a single episode in the summer (on August 2 the PWG killed one of their former member, who had surrendered), the whole year of 2004 was peaceful. This stands in stark contrast with previous and subsequent years. Figure 5 makes this discontinuity

[12] 60 people were killed in January and February 2005 alone (Balagopal 2005). Miklian (2011) describes 2005 in Andhra Pradesh as the "most violent in the history of the conflict", with over 500 people killed, a third of them civilians.

visible. It also shows that, just after hostilities resumed in January 2005, the frequency of violent events reached its highest point within the whole period (the ‘area’ between January and May 2005 is almost completely black). This absence of violence in 2004 was widely reported in the media in India. For instance, Shri Kannabiran, wrote in early 2005 in an open letter to the India Prime Minister, on behalf of a civil society organization called the Committee of Concerned Citizens that “[t]he six months of ceasefire/talks have witnessed an atmosphere of peace, particularly in rural Telangana and it is indeed a creditable achievement that, after almost a decade, there has been no loss of life at all either in encounters by police or actions by Naxalite parties. There is an overwhelming sense of relief and security felt by the common people in the villages who were earlier often sandwiched in the cross fire between police and Naxalites.” This feeling is reported widely in major India newspapers, as well as by local news agencies.

One important point for our analysis is that the period of peace (May 2004-January 2005) encompassed the monsoon periods in 2004. Droughts in India generally occur during monsoon periods, when rainfall is below expected levels. This was the case in 2004 across most districts in Andhra Pradesh, as well as several other years in the 2000s. In Andhra Pradesh, according to the Ministry of Agriculture, “South-West and North-East Monsoons are the two important periodic winds, which are the important sources of the rain. South-West Monsoon (66%) is spread over the period from June to September and North-East Monsoon (24%) from October to December”. Thus, during the monsoon periods of 2004, in stark contrast with previous and subsequent years, the state was peaceful due to the ceasefire. Since the impetus for the cease-fire was a change in political leadership, there are no obvious reasons why the ceasefire would be related to either the occurrence of drought or to household economic characteristics. Therefore, the discontinuity in violence we observe in 2004 can be considered exogenous to child nutrition outcomes and it allows us to measure whether drought has had a differential impact on the nutritional status of children if it occurred during peaceful or fighting periods.

This empirical strategy requires that two important assumptions are valid. First, drought must be of at least the same magnitude in 2004 than in other years. Second, children who were affected by a drought in 2004 must be no less vulnerable than children who were affected by a drought in other years. If either one of these assumptions is not met, we would wrongly attribute to the ceasefire the effects of lesser droughts and/or of lesser vulnerability of children. We discuss each of these assumptions in detail below.

The first assumption is that drought must be of at least the same magnitude in 2004 when compared to other years. According to the Young Lives community questionnaires, 19 communities experienced drought during the time of the ceasefire, 14 experienced drought before the ceasefire, and 20 experienced drought after the ceasefire. The state of Andhra Pradesh was largely declared drought-affected in 2004. Figure 6 shows monthly rainfall deviations with respect to historic averages in our sample. The period of the ceasefire is demarcated by the two vertical lines. It is clear that during this period, rainfall was below normal, and more so than in any other period between 2002 and 2006.

The second assumption is that children who were affected by a drought in 2004 must be comparable to children who were affected by a drought in other years. Given the panel structure of the YL data, we are able to analyse the same cohort of children across time. This gives rise to a potential challenge to our empirical strategy: children going through a drought in 2004 are either younger or older than children who experienced a drought in other years. According to research on child nutrition, it is well established that children are at highest risk of stunting in the first 1000 days of life (Bhutta et al. 2013, Hoddinott et al. 2013). Thus, if we were to compare children that went through a drought during the ceasefire with younger, more vulnerable children, we might find an effect that is not attributable to the ceasefire but to the age and corresponding stunting risk of the children. Therefore, our empirical strategy would overestimate the effect of the cease-fire on household vulnerability to drought.

Our strategy consists then in comparing the effect of drought in 2004 versus 2005-06 based on the assumptions that the rainfall deficit in 2004 was not lower than in later periods; and that children were not less vulnerable than in later periods. We resort to a child fixed effects estimation as follows.

$$HAZ_{ihvt} = \beta_1 D_v + \beta_2 I_{hv} + \beta_3 (D_v \times Ceasefire) + \beta_4 X_{ihvt} + \mu_{ih} + \eta_t + \epsilon_{ihht} \quad (3)$$

Our parameter of interest is β_3 which corresponds to the difference in the impact of drought due to the ceasefire. Results are displayed in tables 11 and 12 for HAZ and in tables 13 and 14 for WAZ. Like in previous estimations we present three specifications. Each of these estimations is done on two samples: mandals affected by the Naxal conflict, and mandals not affected by the conflict.

The estimated impact of drought outside the ceasefire period on HAZ is not statistically different from 0 in peaceful mandals. This holds true irrespective of the specification when using the standard drought variable (table 11) and in the two specifications with controls for the severe drought variable (columns (3) and (5) in table 12). In conflict-affected mandals, however, the impact of drought is negative and very large in absolute value (-1.7 standard deviations in the specification with all controls for both drought variables). The impact is also very precisely estimated (at 1% level of confidence) in our preferred specifications.

The coefficient associated with the interaction between drought and ceasefire displays the expected positive sign, indicating that the ceasefire has mitigated the impact of the drought. The interaction term is only statistically significant at the 10% level of confidence, but the point estimates are sizeable. This relative lack of precision of the estimated interaction is likely driven by the small sample size available for these regressions. The estimations are based on 78 children who experienced drought during the ceasefire, 40 children who have experienced drought outside the ceasefire, and 51 children who have not experienced drought altogether (among a total of 169 children observed twice). Achieving large precision with this sample size would require an implausibly large effect size. We are therefore quite confident that the results reported above are credible and show a true mitigating effect of the ceasefire, in light of these small sample size challenges and given the FE-2SLS estimations discussed in the previous section. In addition, it is also important that we note the explanatory power of our model. The R^2 of the regressions for Naxal affected areas is over 0.50, whereas it is a mere 0.19 at its maximum in regressions conducted in the non-affected sample. This suggests that, as expected, the ceasefire has a much larger effect in Naxal affected areas.

In terms of magnitude, the effect of the ceasefire is quite considerable: the ceasefire offsets 48% and 60% of the drought impact in column (6) of tables 11 and 12, respectively. In fact when the total marginal effect of drought during the ceasefire is computed, this effect is not statistically different from 0.[13] As a result, the estimated difference in HAZ between children that experienced drought during the ceasefire and those who experienced drought amidst violence is very large (at 1.7 standard deviation). This analysis adds further strength to the results discussed in section 4, where we showed that drought in Andhra Pradesh leads to long-term adverse nutritional impact only when it interacts with conflict.

When the WAZ indicator is used, the effect of drought is for the most part indistinguishable from 0. This is especially true when we use the severe drought variable (table 14). Overall, this echoes the findings of section 4 where we did not find much evidence that droughts affected WAZ. Like for the HAZ analyses, the interaction between drought and ceasefire is positive and significant at the 1% level in conflict-affected mandals. This is true in all specifications where the point estimate is consistently around 0.3 s.d. In peaceful mandals, the interaction term is always negative. It does not reach the usual level of significance in table 14 when the severe drought variable is used. The estimations with WAZ are therefore less conclusive than those using HAZ, mostly because WAZ does not relate on a consistent basis with past droughts.

[13] Using the notation of equation 3, the full marginal effect of drought during the ceasefire is $\beta_1 + \beta_3$ and its corresponding standard error is $\sqrt{\text{var}(\beta_1) + \text{var}(\beta_3) + 2\text{cov}(\beta_1, \beta_3)}$.

6 Causal mechanisms

There are several plausible reasons why the Naxal insurgency may have had such dramatic adverse effects on household welfare during the 2004 drought. The available data does not allow us to provide precise quantitative evidence on the mechanisms that may explain the strong effects of the interaction between conflict (and the ceasefire) and drought on child nutrition. However, we discuss below what we believe is very compelling evidence suggesting that the Naxal insurgency may have considerably affected household access to important economic coping strategies, as well as access to government-provided goods and services.

6.1 Coping strategies during the conflict

Violent conflicts tend to have substantial effects on local social relations and informal support networks, due to increased mistrust and lower levels of cooperation between community members (Kalyvas 2006), and the isolation of communities by armed groups seeking to control territories and populations (Gafaro, Ibanez & Justino 2013). As a result, important coping strategies such as risk-sharing arrangements at the level of the extended family, villages or ethnic networks may be severely disrupted. One of the strongest channels reported in the media and in more qualitative literature on the Naxal insurgency in India is the fact that the presence of the Naxals in contested areas may lead to an increase in isolation of communities by making travel and outside relations unsafe and by explicitly restricting people's freedom of movement (Pandita 2011, Sharma 2012, Chakravarti 2009). Isolation and fear could, in turn, undermine social interactions that underpin informal risk-pooling mechanisms, as well as hindering coping strategies that involve access to markets and public goods (e.g. Christiaensen, Hoffmann & Sarris 2007). Shah (2009) and Shneiderman (2009) describe, respectively, the rise of levels in uncertainty and ambivalence in local social relations in areas of conflict in Jharkhand (where the Naxal movement operates strongly) and Nepal (where similar groups fought government troops for several years).

In Andhra Pradesh, we have some evidence suggesting that coping strategies based on local social interactions may have been affected by the Naxal conflict. Table 15 lists the most common coping strategies reported by households affected by drought in Andhra Pradesh. The table compares households in Naxal-affected communities with those in communities not affected by the conflict. The results show that community and family-based strategies are not widely used by households affected by drought. This may be due to the covariate nature of the shock. However, the table shows some substantial differences in the type of coping strategies used by households in conflict and non-conflict areas. Notably, households living in areas affected by the Naxal insurgency tend to reduce their expenditure, are more dependent on government and NGO transfers and reduce significantly the amount of meals consumed. These results suggest a large degree of distress among households trying to cope with drought in Naxal-affected mandals.

Seasonal migration is often reported as an important coping strategy adopted by vulnerable populations in Andhra Pradesh (Jones, Mukherjee & Galab 2007). Table 15 shows no statistically significant difference in the number of households reporting having migrated for work as a coping strategy when we compare Naxal-affected and non-Naxal affected areas. However, differences in seasonal migration patterns are visible in figure 7, where we report data from the community survey of YL on annual migration in violence-affected and non-affected areas in 2006: during the lean season (especially from March to May) many people leave their villages to seek work. The pattern is similar in both areas but in violence-affected areas the magnitude of out-migration is noticeably lower.

6.2 Access to public goods and services

Government-provided services usually cease to operate in conflict-affected areas (if they existed at all in place in the first place) (Mampilly 2011). This is often caused by concerns with the security of government officials, or the destruction of roads and other infrastructure that prevents services from reaching violence-affected areas. Both causes could be at play in our case study. First, Jones, Mukherjee & Galab (2007) hint to this situation in one of our sampled mandals: ”[t]he area is also affected by the presence of Naxalite forces, which makes government officials reluctant to implement programmes and prevents local people from gaining access to authorities and information“ (p. 11). Second, as discussed in section 2, Naxal groups in Andhra Pradesh have been reported to destroy infrastructure and attack government officials as tactics to isolate populations and territories from government access, create safe heavens for themselves and ensure population compliance.

Making use of the information provided in the Young Lives panel dataset, we have investigated whether restricted access to public programs during the ceasefire may explain our results. The dataset contains information on household participation in several programs. The main program in place is the Public Distribution System (PDS). Table 16 gives an overview on some of the variables indicating distribution levels, scope and satisfaction with this service. During the 12 months prior to the second wave of the Young Lives survey (in 2006), about 88 percent of households report having received food aid through the Public Distribution System. The extent of access to the food distribution system was 86.3 percent in violence-affected areas and 89 percent in non-affected areas. When asked whether recipients were satisfied with the service, 55.7% of respondents living in violence-affected answered positively, while a higher percentage (65.7%) reported being satisfied with the service in non-affected areas (differences are significant at the 1% level). Also, only 24.9% of respondents in violence-affected areas (versus 35.7% in non- affected areas) declared that at least some of this aid went directly to the YL child (significant at 1 percent level). These results suggest that food aid in 2006 may have been less efficient in violence-affected areas, in comparison to non-affected areas.

But adequate food supply is not the only driver of stunted growth, health and sanitation also play significant parts in child growth and development (e.g. World Bank 2013). As alluded to earlier in the paper, available data on access to services does not suggest that Naxal mandals were worse off than non-Naxal mandals in either 2002 or 2006. However, looking specifically at sanitation, we find a much lower proportion of households accessing relevant services in 2006 in Naxal mandals (10.3%) than in non-Naxal mandals (36.7%). The difference is significant at the 1% level.

Furthermore, some health indicators tend to suggest that significant differences across the areas might exist. For example, 447 respondents in the second round of the Young Lives survey reported that the YL child[14] had a serious injury or illness (where the caretaker/respondent thought it might die, mostly from malaria or high fever) in the four years prior to the survey. This corresponds to 38.4 percent of respondents in violence-affected areas, and 31.9 percent in areas not affected by the insurgency. The data shows in addition that households in violence-affected areas are significantly less likely to have vaccination cards for their children (24.5 versus 49.9 percent) and that children living in violence-affected areas are less likely to have been immunized against meningitis (38.3 versus 30.4 percent).

7 Conclusion

Sustaining economic development in areas characterized by longstanding political tensions where actors persistently resort to violence to resolve social conflicts is an enormous challenge. This paper shows that this challenge is significantly exacerbated by the complex effects of political violence on the ability of households to cope with common covariate shocks.

The paper shows two important results. First, drought exerts a strong impact on malnutrition, but only when it occurs in a violent environment. Second, we found that political violence exerts a long term impact on child malnutrition only indirectly, when the combination of conflict with drought prevents households to appropriately protect their children against adverse nutritional shocks. Although existing data does not allow us to show irrefutable evidence for the mechanisms at play, our analysis strongly suggests that the adverse combined welfare impact of conflict and drought is explained by a failure

[14] The YL is the index child who is followed by the survey.

of economic coping strategies and restricted access to public services and aid in conflict-affected communities, possibly due to fear, insecurity and isolation.

This result has several theoretical and policy implications. First, the analysis discussed in the paper provides a strong sense of how people cope with multiple (economic and political) shocks. 1.5 billion people live in conflict-affected countries (World Bank 2011), where they have to cope with a myriad of risks, in addition to violence and instability. An important feature of these political shocks is the fact that they lead to significant changes in the institutional environments under which people make decisions (Gafaro, Ibanez & Justino 2013), and to people's social preferences (Voors, Nillesen, Bulte, Lensink, Verwimp & van Soest 2012). This paper provides a first attempt at documenting how violent conflict may affect the ability of households to cope with periods of drought, a shock commonly experienced by many other low-income countries affected by civil wars and other forms of political instability.

Although the Naxal insurgency has been brutal, is by no means comparable to civil wars such as those in Burundi, Rwanda, DRC or South Sudan, where hundreds of thousands of civilians have died, either directly or indirectly due to food shortages and diseases. However, the ongoing armed Naxal insurgency in India and the extreme brutality of some of the attacks has created an environment hostile to poverty alleviations strategies, common to many other countries affected by violent conflict in Asia, Africa and Latin America. Interestingly, low levels of child nutrition have been shown to be of particular concern in India, where malnutrition has remained high despite considerable levels of economic growth (Deaton & Dreze 2009). Our result suggests that in some parts of India this may be partially due by unusual high levels of violence, fear and uncertainty. This could provide an interesting area of future research.

The results in the paper show also the potential significance of early peace processes in developing economies affected by violent conflict. In particular, the results illustrate how risk coping structures can be rapidly established, even among some of the most vulnerable households in India, once fear and uncertainty are reduced. Although any amount of fighting will have adverse effects of people's lives, rapid recovery seems possible. Davis & Weinstein (2002) and Miguel & Roland (2011) have shown this to be the case in countries affected by WWII and in Vietnam, respectively. These results were attributed to higher state investments in areas affected by violence, leading to long-term economic convergence at the national level. Our results suggest that human capital outcomes may also be able to recover through restoration of informal networks and better access to safety nets and other services. This may, in turn, have important positive general equilibrium effects if early peace dividends in terms of human capital outcomes translate into higher levels of education and higher earnings, which may in the future increase the opportunity costs of supporting armed insurgency.

Violent fighting in Andhra Pradesh resumed once the peace negotiations stalled and then failed in early 2005. Strong police attacks fronted by the powerful Greyhound forces in Andhra Pradesh eventually got the upper hand and the Naxal movement was pushed over the state borders. Violence has dramatically reduced in Andhra Pradesh from 2006 onwards. In addition to military and police action, the state government in Andhra Pradesh has taken a "winning hearts and minds" approach, including the promotion of the flagship Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) in Naxal-affected areas. Perceptions on the benefits of these programs, as well on Naxal support in Andhra Pradesh have been mixed, and it is possible that conflict may return to Andhra Pradesh in the near future. This paper provides an indication of the enormous benefits of maintaining peace for the millions of households that live in Andhra Pradesh, as well as many others affected by violence across the world. This of course depends on the extent of political willingness to credibly commit to peace.

References

Abadie, A. & J. Gardeazabal. 2003. "The Economic Costs of Conflict: A Case Study of the Basque Country." *American Economic Review* 93(1):113–132.

Akbulut-Yuksel, M. 2009. "Children of War: The Long-Run Effects of Large-Scale Physical Destruction and Warfare on Children." HiCN Working Paper no. 62, Households in Conflict Network (www.hicn.org).

Akresh, Richard, Philip Verwimp & Tom Bundervoet. 2007. "Civil War, Crop Failure and Child Stunting in Rwanda." World Bank Policy Research Working Paper 4208, The World Bank.

Akresh, Richard, Sonia Bhalotra, Marinella Leone & Una Okonkwo Osili. 2012. "War and Stature: Growing Up during the Nigerian Civil War." *American Economic Review* 102(3):273–77.

Alderman, Harold, John Hoddinott & Bill Kinsey. 2006. "Long term consequences of early childhood malnutrition." *Oxford Economic Papers* 58(3):450–474.

Balagopal, K. 2005. "Naxalites in Andhra Pradesh. Have We Heard the Last of the Peace Talks?" *Economic and Political Weekly* (March 26):1323 – 1329.

Barron, Patrick & Joanne Sharpe. 2005. "Counting Conflicts: Using Newspaper Reports to Understand Violence in Indonesia." Conflict Preventionand Reconstruction Paper No. 25, The World Bank.

Besley, Timothy & Hannes Mueller. 2012. "Estimating the Peace Dividend: The Impact of Violence on House Prices in Northern Ireland." *American Economic Review* 102(2):810–33.

Bhutta, Z.A., J.K. Das, A Rizvi, M.F Gaffey, N Walker, S Horton, P Webb, A Lartey & R.E Black. 2013. "Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?" *The Lancet* 382(9890):452 – 477.

Borooah, Vani K. 2008. "Deprivation, Violence, and Conflict: An Analysis of Naxalite Activity in the Districts of India." *International Journal of Conflict and Violence* 2(2):317–333.

Buchanan-Smith, M. & I. Christoplos. 2004. "Natural disasters and complex political emergencies." *Humanitarian Exchange Magazine* 27:36–38.

Bundervoet, Thomas & Philip Verwimp. 2005. "Civil War and Economic Sanctions: An Analysis of Anthropometric Outcomes in Burundi." HiCN Working Paper no. 11, Households in Conflict Network (www.hicn.org).

Bundervoet, Tom, Phillip Verwimp & Richard Akresh. 2009. "Health and Civil War in Rural Burundi." *Journal of Human Resources* 44(2):536–563.

Central Committee. 2004. "Strategy and Tactics of the Indian Revolution." Central Committee (P) CPI (Maoist) last accessed on 4 March 2014 on http://www.bannedthought.net/India/CPI-Maoist-Docs/Founding/StrategyTactics-pamphlet.pdf.

Chakravarti, Sudeep. 2009. *Red Sun. Travels in Naxalite Country.* Penguin Books.

Christiaensen, Luc, Vivian Hoffmann & Alexander Sarris. 2007. Gauging the welfare effects of shocks in rural Tanzania. Policy Research Working Paper Series 4406 The World Bank.

Christoplos, Ian. 2004. "Agricultural Rehabilitation In Afghanistan: Linking Relief, Development and Support to Rural Livelihoods." ODI Case Study Report.

Dasgupta, A. 2013. "Can the Major Public Work Policy Buffers Negative Shocks in Early Childhood? Evidence from Andhra Pradesh, India." Young Lives Working Paper 112.

Davis, Donald R. & David E. Weinstein. 2002. "Bones, Bombs, and Break Points: The Geography of Economic Activity." *American Economic Review* 92(5):1269–1289.

Deaton, Angus & Jean Dreze. 2009. "Food and Nutrition in india: Facts and interpretations." *Economic and Political Weekly* XLIV(7):42–65.

Dercon, Stefan. 2004. "Growth and shocks: evidence from rural Ethiopia." *Journal of Development Economics* 74(2):309–329.

Dercon, Stefan, John Hoddinott & Tassew Woldehanna. 2005. "Shocks and Consumption in 15 Ethiopian Villages, 1999–2004." *Journal of African Economies* 14(4):559–585.

Domingues, Patrick & Thomas Barre. 2013. "The Health Consequences of the Mozambican Civil War: An Anthropometric Approach." *Economic Development and Cultural Change* 61(4):755 – 788.

Eriksen, S. & J. Lind. 2009. "Adaptation as a political process: adjusting to drought and conflict in KenyaŠs drylands." *Environmental Management* 48:817–835.

Fearon, James D. & David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97(1):75–90.

Gafaro, M, A. M Ibanez & P Justino. 2013. "Social Organisation and Armed Group Presence in Colombia." Unpublished manuscript.

Government of India. 2008. Development Challenges in Extremist Affected Areas. Report of an expert group to planning commission.

Government of India. Various years. “Annual Report.” Ministry of Home Affairs.

Guerrero-Serdan, Gabrielle. 2009. “The Effects of the War in Iraq on Nutrition and Health: An Analysis Using Anthropometric Outcomes of Children.” HiCN Working Paper no. 55, Households in Conflict Network (www.hicn.org).

Harris, K., D. Keen & T. Mitchell. 2013. “When disasters and conflicts collide. Improving links between disaster resilience and conflict prevention.” Overseas Development Institute, London UK.

Hirshleifer, Jack. 2001. *The Dark Side of the Force: Economic Foundations of Conflict Theory.* Cambridge, UK: Cambridge University Press.

Hoddinott, John, Jere R Berhman, John A Maluccio, Paul Melgar, Agnes R Quisumbing, Manuel Ramirez-Zea, Aryeh D Stein, Kathryn M Yount & Reynaldo Martorell. 2013. “Adult consequences of growth failure in early childhood.” *American Journal of Clinical Nutrition* 98(5):1170–1178.

Jaspars, Susanne & Sorcha O’Callaghan. 2010. “Livelihoods and protection in situations of protracted conflict.” *Disasters* 34(2):165–182.

Jones, Nicola, Madhuri Mukherjee & S. Galab. 2007. “Ripple Effects or Deliberate Intentions? Assessing Linkages between Women’s Empowerment and Childhood Poverty.”.

Justino, Patricia. 2012. Violent Conflict and Human Capital Accumulation. In *Elgar Companion to Civil War and Fragile States*, ed. Graham Brown & Arnim Langer. Edward Elgar Publishing chapter 13.

Justino, Patricia, Tilman Brück & Philip Verwimp. 2013. *A Micro-Level Perspective on the Dynamics of Conflict, Violence and Development.* Oxford University Press.

Kalyvas, Stathis N. 2006. *The Logic of Violence in Civil War.* New York, NY: Cambridge University Press.

Kannabiran, Kalpana, Vasanth Kannabiran & Volga. 2005. “Reflections on the Peace Process in Andhra Pradesh.” *Economic and Political Weekly* 40(7).

Kellett, J. & D. Sparks. 2012. “Disaster Risk Reduction. Spending where it should count.” Global Humanitarian Assistance (GHA) Briefing Paper, Somerset UK.

Krishna, Anirudh. 2006. “Pathways Out of and Into Poverty in 36 Villages of Andhra Pradesh, India.” *World Development* 34(2):271–288.

Kujur, Rajat. 2008. “Naxal Movement in India: A Profile.” Institute of Peace and Conflict Studies, Research Paper no. 15.

Lvovsky, Kseniya. 2006. “Overcoming Drought: Adaptation Strategies for Andhra Pradesh, India.” Washington, D.C.: World Bank.

Mampilly, Zachariah Cherian. 2011. *Rebel Rulers: Insurgent Governance and Civilian Life During War*. Cornell University Press.

Miguel, Edward & Gerard. Roland. 2011. "The Long Run Impact of Bombing Vietnam." *Journal of Development Economics* 96(1):1–15.

Miklian, Jason. 2011. "Revolutionary Conflict in Federations: The Indian Case." *Conflict, Security and Development* 11(1):25–53.

Ministry of Home Affairs. 2002. "Annual Report.".

Ministry of Home Affairs. 2003. "Annual Report.".

Ministry of Home Affairs. 2004. "Annual Report.".

Ministry of Home Affairs. 2005. "Annual Report.".

Ministry of Home Affairs. 2006. "Annual Report.".

Minoiu, Camelia & Olga N. Shemyakina. 2012. Armed Conflict, Household Victimization, and Child Health in Côte d'Ivoire. HiCN Working Papers 115 Households in Conflict Network.

Mitra, D M. 2011. Genesis and Spread of Maoist Violence and Appropriate State Strategy to Handle it. Technical report Institute of Social Sciences 8, Nelson Mandela Road, New Delhi: .

PACS. 2008. "Drought in India: Challenges and Initiatives." Poorest Areas Civil Society (PACS) Programme 2001-2008.

Pandita, Rahul. 2011. *Hello, Bastar: the untold story of India's Maoist movement*. Chennai: Tranquebar Press.

Shah, Alpa. 2009. "In Search of Certainty in Revolutionary India." *Dialectical Anthropology* 33(3/4):271 – 286.

Sharma, Supriya. 2012. "The Outcastes of a Liberated Zone." Open Magazine.

Shneiderman, Sara Beth. 2009. "The formation of political consciousness in rural Nepal." *Dialectical Anthropology* 33(3/4):287 – 308.

Singh, Abhijeet, Albert Park & Stefan Dercon. 2014. "School Meals as a Safety Net: An Evaluation of the Midday Meal Scheme in India." *Economic Development and Cultural Change* 62(2):275–306.

Stock, James H., Jonathan T. Wright & Motohiro Yogo. 2002. "A Survey of Weak Instruments and Weak Identification in Generalized Methods of Moments." *Journal of Business and Economic Statistics* 20(4):518–529.

UNDP. 2011. "Disaster-Conflict Interface: Comparative Experiences." United Nations Development Programme, Bureau for Crisis Prevention and Recovery. United Nations Development Programme: New York.

UNESCO. 2011. “The Hidden Crisis: Armed Conflict and Education.” Education for All Global Monitoring Report.

Vadlamannati, Krishna C. & H.A. Khan. 2010. “A Duplicitous Revolution? Maoists' Armed Conflict and Public Goods Provisioning in Rural India.” Unpublished manuscript.

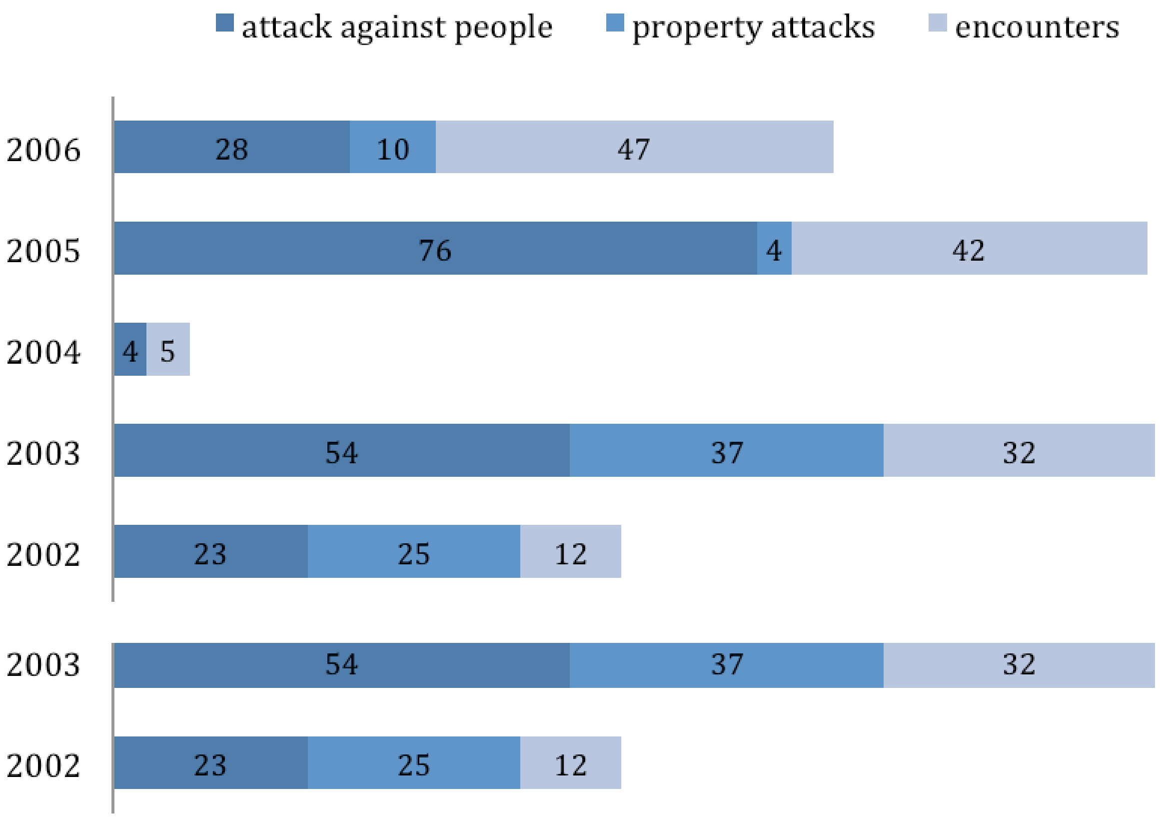
Voors, Maarten, Eleonora Nillesen, Erwin Bulte, Robert Lensink, Phillip Verwimp & Daan van Soest. 2012. “Violent Conflict and Behavior: a Field Experiment in Burundi.” *American Economic Review* 102(2):941–964.

World Bank. 2006. “Overcoming drought : adaptation strategies for Andhra Pradesh, India.” Directions In Development series. Environment and sustainable development. Washington, DC: World Bank.

World Bank. 2011. World Development Report 2010/2011: Conflict, Security, and Development. Technical report The World Bank, Washington, DC.

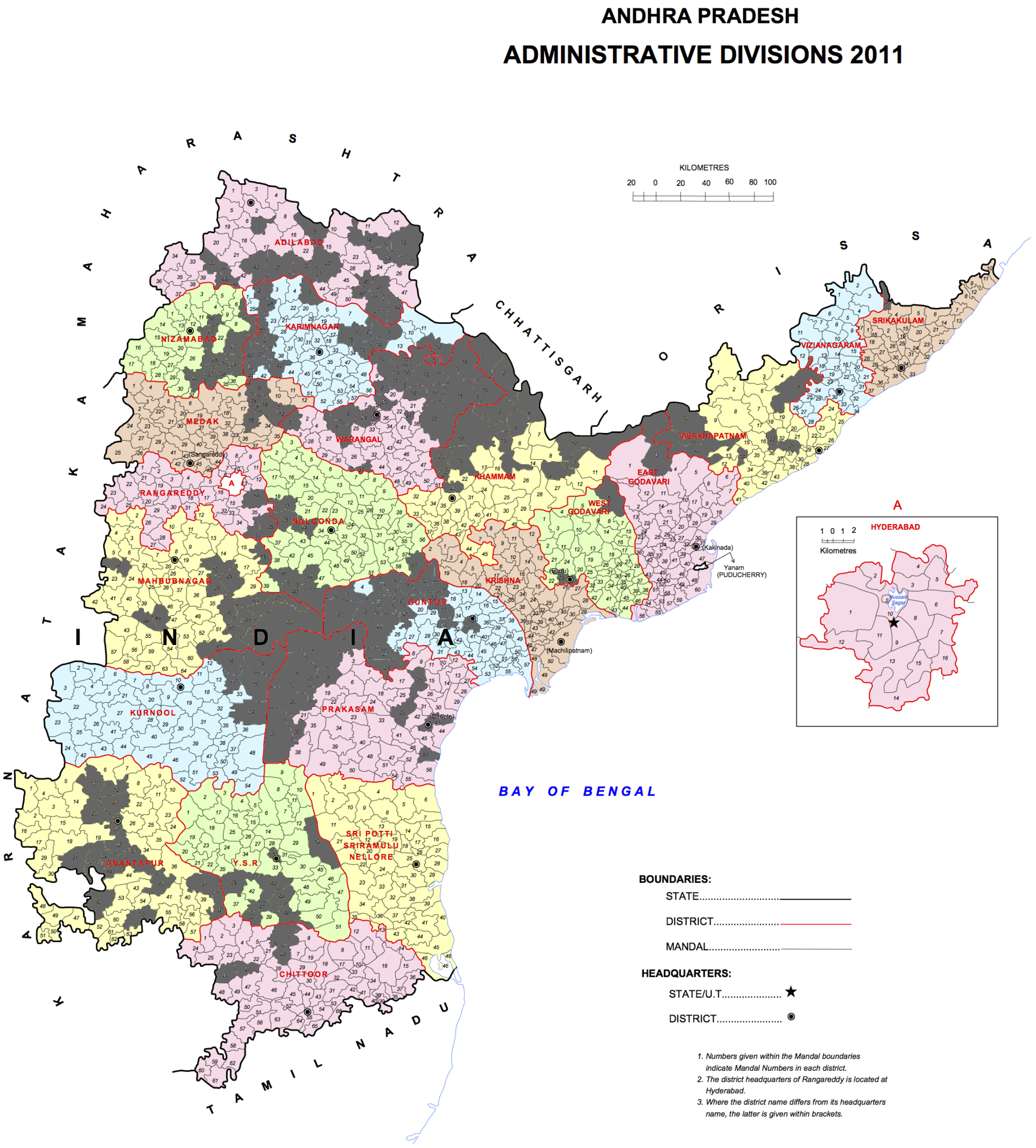
World Bank. 2013. “Improving Nutrition Through Multisectoral Approaches.” International Bank for Reconstruction and Development.

Figure 1: Yearly Number of Naxal Attacks Against People and Property, and Encounters in Andhra Pradesh 2002-2006



Source: Authors' calculations based on SATP data.

Figure 2: Spatial Distribution of Mandals Affected by the Naxal Insurgency in Andhra Pradesh, 2002-2006



Note: Affected mandals appear in grey. Source: authors' calculations based on SATP data.

Table 1: Nutrition Indicators of Sampled Children in 2002 and 2006

	Height for Age z-score (HAZ)	Weight for Age z-score (WAZ)	% Stunted[a]	% Wasted[b]
	Panel A: Statistics in 2002 (children were 1 year-old)			
Average	-0.89	-1.53	0.22	0.32
Children living in:				
Naxal-affected Mandals	-0.57	-1.39	0.16	0.26
Non Naxal-affected Mandals	-1.00	-1.57	0.24	0.34
Drought-affected Villages	-0.49	-1.43	0.16	0.28
Non Drought-affected Villages	-1.10	-1.57	0.25	0.33
Naxal-affected mandals & Drought-affected Villages	-0.04	-1.31	0.10	0.22
	Panel B: Statistics in 2006 (children were 5 year-old)			
Average	-1.70	-1.92	0.30	0.47
Children living in:				
Naxal-affected Mandals	-1.67	-1.95	0.29	0.48
Non Naxal-affected Mandals	-1.72	-1.91	0.30	0.46
Drought-affected Villages	-1.72	-1.88	0.30	0.44
Non Drought-affected Villages	-1.70	-1.95	0.30	0.50
Naxal-affected mandals & Drought-affected Villages	-1.85	-1.91	0.33	0.47

Source: authors' calculations based on the Young Lives dataset.

a: A child is considered to be stunted if her height-for-age z-score is smaller than 2 standard deviations

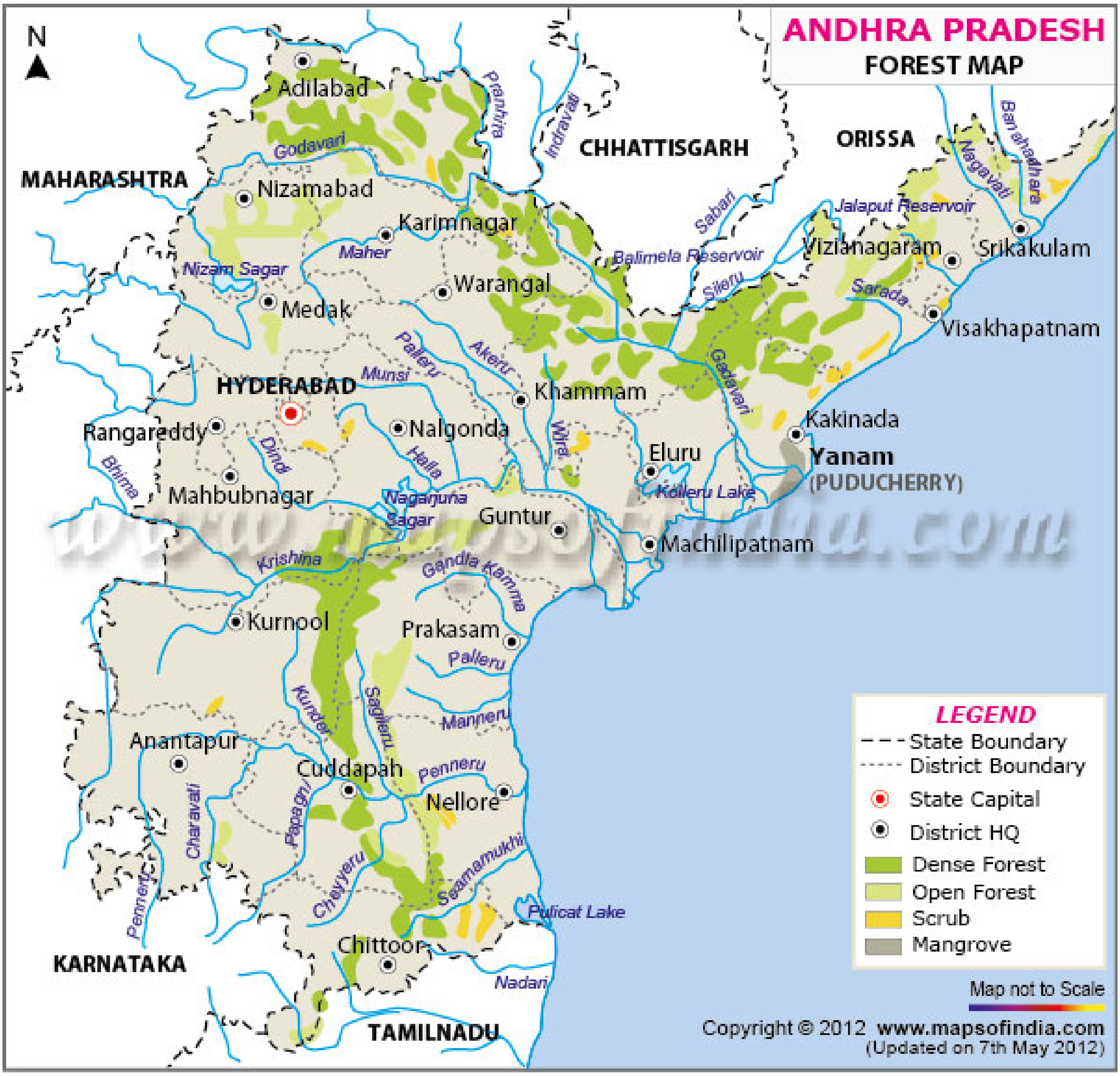
b: a child is considered to be wasted if her weight-for-age z-score is smaller than 2 standard deviations.

Table 2: Exposure of Rural Households to Drought in Andhra Pradesh, 2002-2006

District	% of households who suffered from drought (Household survey)	Who was affected (%)				% of rural villages which suffered from drought (Community survey)
		household only	household and others in village	all households in village	village and beyond	
West Godavari	8.05	14.29	71.43	14.29	0	0
Srikakulam	13.62	26.00	50.00	12.00	12.00	46.15
Cuddapah	13.71	16.67	45.83	20.83	16.67	54.55
Anantapur	84.34	2.11	57.81	40.08	0	100
Karimnagar	25	0	45.45	36.36	18.18	100
Mahboobnagar	45.11	2.55	29.94	25.48	42.04	76.19
Whole sample	39.92	5.43	47.28	31.19	16.10	62.65

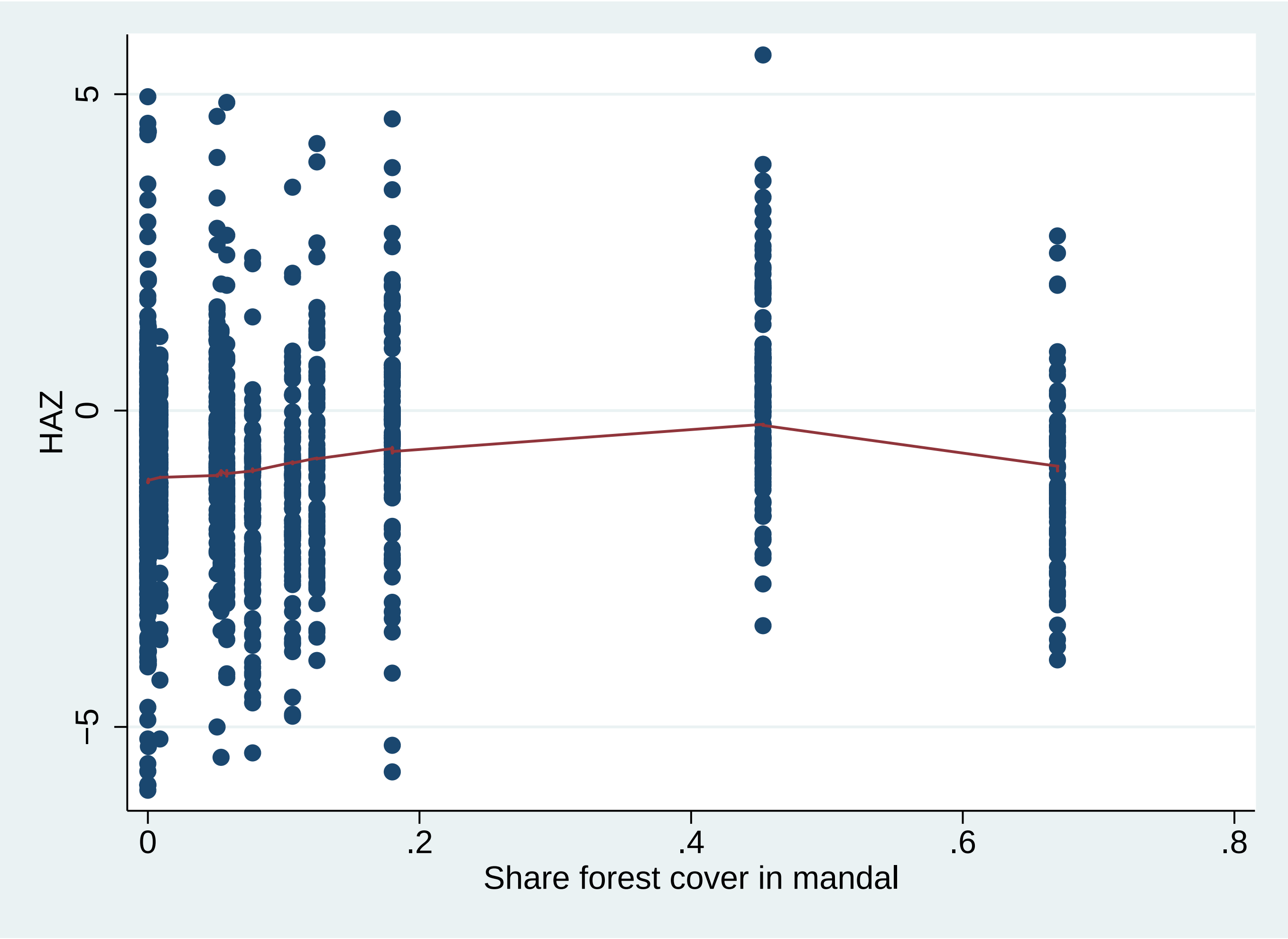
Source: authors' calculations from Young Lives data. Statistics on households are based on rural households with a YL child of the younger cohort and that have not moved between 2002 and 2006.

Figure 3: Spatial Distribution of Forest Cover in Andhra Pradesh



Source: Maps of India.

Figure 4: Relationship Between Share of Forest Cover and HAZ in 2002



Source: authors' calculations based on YL data.

Table 3: FE-2SLS Estimations of Naxal-Related Violence on HAZ

	(1) HAZ	(2) HAZ	(3) HAZ	(4) HAZ	(5) HAZ	(6) HAZ
Round	-0.39***	-0.48***	-0.45***	-0.44***	-0.58***	-0.56***
	(0.10)	(0.11)	(0.13)	(0.11)	(0.12)	(0.13)
Drought	-0.38***	-0.27**	-0.25*	-0.29*	-0.12	-0.0066
	(0.12)	(0.13)	(0.14)	(0.15)	(0.14)	(0.15)
Illness	-0.18*	-0.19	-0.20	-0.10	-0.070	-0.12
	(0.10)	(0.13)	(0.12)	(0.15)	(0.17)	(0.17)
Round x violence	-0.20	-0.30	-0.53	0.19	0.22	0.052
	(0.28)	(0.35)	(0.36)	(0.19)	(0.23)	(0.22)
Drought x violence				-0.57	-0.89**	-1.40***
				(0.47)	(0.41)	(0.33)
Illness x violence				-0.27	-0.44	-0.14
				(0.25)	(0.38)	(0.34)
Land cultivated p.c.		-0.070	-0.075		-0.046	-0.070
		(0.092)	(0.090)		(0.100)	(0.10)
Land owned p.c.		-0.044	-0.029		-0.082	-0.066
		(0.095)	(0.097)		(0.099)	(0.11)
Draught cattle p.c.		0.079	0.085		0.072	0.064
		(0.059)	(0.067)		(0.060)	(0.063)
Sheeps, pigs, goats p.c.		-0.0089	-0.0032		-0.0091	-0.0014
		(0.027)	(0.027)		(0.026)	(0.025)
Rabbit & poultry p.c.		-0.042	-0.049		-0.029	-0.023
		(0.052)	(0.056)		(0.054)	(0.058)
Wealth Index		-0.0100	-0.0096		-0.0098	-0.0092
		(0.011)	(0.011)		(0.011)	(0.011)
Household size		-0.0034	-0.0045		0.0032	0.0068
		(0.022)	(0.023)		(0.022)	(0.021)
Children below 5 yrs		0.0070*	0.0071*		0.0069	0.0068
		(0.0040)	(0.0042)		(0.0043)	(0.0049)
MDM registration		0.15	0.16		0.16*	0.17*
		(0.10)	(0.11)		(0.097)	(0.10)
MGNREGS registration		-0.074	-0.039		-0.044	0.027
		(0.17)	(0.18)		(0.15)	(0.15)
% irrigated land			0.43			0.42
			(0.35)			(0.40)
Drinking Water Facilities			-0.061			-0.16
			(0.17)			(0.18)
Sewerage Facilities			-0.27			-0.33
			(0.35)			(0.31)
Observations	2114	1570	1438	2114	1570	1438
R^2	0.28	0.29	0.31	0.29	0.32	0.33

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the village level.

Table 4: FE-2SLS Estimations of Naxal-Related Violence on WAZ

	(1) WAZ	(2) WAZ	(3) WAZ	(4) WAZ	(5) WAZ	(6) WAZ
Round	-0.27***	-0.36***	-0.33***	-0.26***	-0.35***	-0.33***
	(0.052)	(0.060)	(0.068)	(0.057)	(0.068)	(0.073)
Drought	-0.036	0.015	0.020	-0.080	-0.014	-0.0093
	(0.064)	(0.064)	(0.074)	(0.071)	(0.077)	(0.087)
Illness	-0.022	-0.050	-0.078	0.00049	0.0084	-0.026
	(0.055)	(0.061)	(0.065)	(0.073)	(0.089)	(0.094)
Round x violence	-0.38***	-0.46***	-0.53***	-0.50***	-0.49***	-0.55***
	(0.082)	(0.085)	(0.10)	(0.11)	(0.11)	(0.11)
Drought x violence				0.27**	0.16	0.15
				(0.12)	(0.10)	(0.11)
Illness x violence				-0.11	-0.24	-0.21
				(0.21)	(0.25)	(0.26)
Land cultivated p.c.		-0.0079	-0.017		0.00059	-0.0093
		(0.055)	(0.057)		(0.058)	(0.060)
Land owned p.c.		-0.027	-0.028		-0.033	-0.033
		(0.062)	(0.065)		(0.063)	(0.066)
Draught cattle p.c.		0.036	0.034		0.038	0.037
		(0.037)	(0.039)		(0.038)	(0.040)
Sheeps, pigs, goats p.c.		0.0076	0.0077		0.0073	0.0073
		(0.017)	(0.017)		(0.017)	(0.017)
Rabbit & poultry p.c.		-0.042	-0.043		-0.042	-0.044
		(0.032)	(0.033)		(0.033)	(0.033)
Wealth Index		-0.0031	-0.0028		-0.0032	-0.0028
		(0.0059)	(0.0058)		(0.0059)	(0.0057)
Household size		-0.0035	-0.0043		-0.0042	-0.0050
		(0.011)	(0.011)		(0.011)	(0.011)
Children below 5 yrs		-0.0011	-0.00077		-0.00091	-0.00064
		(0.0016)	(0.0016)		(0.0015)	(0.0016)
MDM registration		0.12**	0.10		0.11*	0.10
		(0.059)	(0.063)		(0.059)	(0.064)
MGNREGS registration		0.013	0.047		0.018	0.045
		(0.064)	(0.068)		(0.064)	(0.067)
Share irrigated land			-0.12			-0.14
			(0.40)			(0.40)
Drinking Water Facilities			-0.18			-0.17
			(0.11)			(0.12)
Sewerage Facilities			0.12			0.12
			(0.10)			(0.11)
Observations	2630	1966	1808	2630	1966	1808
R^2	0.17	0.19	0.18	0.17	0.19	0.19

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the village level.

Table 5: First-Stage Results of the FE-2SLS Estimations of Naxal-Related Violence on HAZ

Corresponding columns in table 3	(1)	(2)	(3)	(4)	(5)	(6)
Endogenous Variable:	Round x Naxal-related violence					
Round x % forest in Mandal	1.50***	1.35***	1.29***	1.47***	1.29***	1.25***
	(0.14)	(0.19)	(0.23)	(0.06)	(0.09)	(0.23)
Drought × % forest in Mandal				0.12	0.21	0.25
				(0.24)	(0.25)	0.32
Illness × % forest in Mandal				-0.12	-0.25**	-0.30***
				(0.09)	(0.12)	(0.11)
F Statistic of Instruments	116.90	48.44	32.99	201.10	120.40	97.89
p-value of F Statistic	0.00	0.00	0.00	0.00	0.00	0.00
Shea Partial R^2	0.45	0.34	0.29	0.82	0.81	0.80
Endogenous Variable:	Drought x Naxal-related violence					
Round x % forest in Mandal				0.001	-0.18**	-0.22**
				(0.02)	(0.07)	(0.09)
Drought × % forest in Mandal				1.60***	1.69***	1.73***
				(0.24)	(0.25)	(0.32)
Illness × % forest in Mandal				-0.12	-0.25**	-0.29***
				(0.09)	(0.11)	(0.10)
F Statistic of Instruments				28.70	28.78	17.29
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.68	0.68	0.63
Endogenous Variable:	Illness x Naxal-related violence					
Round × % forest in Mandal				-0.02	-0.07*	-0.08**
				(0.05)	(0.04)	(0.04)
Drought × % forest in Mandal				0.01	0.02	0.02
				(0.05)	(0.08)	0.10
Illness × % forest in Mandal				1.47***	1.32***	1.30***
				(0.20)	(0.21)	(0.21)
F Statistic of Instruments				326.99	70.29	49.22
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.40	0.29	0.28
Kleibergen-Paap rk LM statistic	7.47	7.87	6.50	4.85	4.07	3.19
Kleibergen-Paap rk LM p-value	0.007	0.005	0.011	0.028	0.044	0.074
Observations	2114	1570	1438	2114	1570	1438

Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors are clustered at village level.

Table 6: First stage of the FE-2SLS Estimations of Naxal-Related Violence on WAZ

Corresponding columns in table 4	(1)	(2)	(3)	(4)	(5)	(6)
Endogenous Variable:	Round x Naxal-related violence					
Round x share forest	1.54***	1.36***	1.31***	1.45***	1.24***	1.20***
	(0.15)	(0.19)	(0.23)	(0.08)	(0.10)	(0.11)
Drought x share forest				0.21	0.29	0.34
				(0.25)	(0.24)	(0.29)
Illness x share forest				-0.10	-0.15	-0.20**
				(0.10)	(0.10)	(0.09)
F Statistic of Instruments	104.59	48.95	33.54	122.56	77.35	83.84
p-value of F Statistic	0.00	0.00	0.00	0.00	0.00	0.00
Shea Partial R^2	0.47	0.35	0.30	0.79	0.74	0.73
Endogenous Variable:	Drought x Naxal-related violence					
Round x share forest				-0.01	-0.21***	-0.25***
				(0.03)	(0.07)	(0.08)
Drought x share forest				1.68***	1.76***	1.82***
				(0.24)	(0.24)	(0.29)
Illness x share forest				-0.10	-0.16	-0.21**
				(0.10)	(0.10)	(0.09)
F Statistic of Instruments				20.97	30.21	24.14
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.71	0.69	0.66
Endogenous Variable:	Illness x Naxal-related violence					
Round x share forest				-0.03	-0.09*	-0.10**
				(0.05)	(0.05)	(0.05)
Drought x share forest				0.03	0.05	0.05
				(0.08)	(0.08)	(0.10)
Illness x share forest				1.52***	1.42***	1.39***
				(0.20)	(0.21)	(0.21)
F Statistic of Instruments				182.58	94.83	68.46
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.44	0.35	0.34
Kleibergen-Paap rk LM statistic	7.19	7.84	6.42	4.81	4.44	3.36
Kleibergen-Paap rk LM p-value	0.007	0.005	0.011	0.028	0.035	0.067
Observations	2630	1966	1808	2630	1966	1808

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level

Table 7: FE-2SLS Estimations of Naxal-Related Violence on HAZ with **severe** drought

	(1) HAZ	(2) HAZ	(3) HAZ	(4) HAZ	(5) HAZ	(6) HAZ
Round	-0.42***	-0.49***	-0.49***	-0.46***	-0.54***	-0.53***
	(0.10)	(0.13)	(0.15)	(0.11)	(0.14)	(0.16)
Severe drought	-0.66***	-0.48***	-0.44**	-0.55***	-0.29	-0.18
	(0.13)	(0.17)	(0.19)	(0.17)	(0.21)	(0.26)
Illness	-0.10	-0.13	-0.15	-0.022	-0.12	-0.17
	(0.13)	(0.17)	(0.18)	(0.18)	(0.27)	(0.28)
Round x violence	-0.041	-0.0068	0.072	0.17	0.23	0.26
	(0.21)	(0.36)	(0.43)	(0.19)	(0.24)	(0.26)
Severe drought x violence				-0.51	-0.88**	-1.00*
				(0.39)	(0.44)	(0.51)
Illness x violence				-0.23	0.12	0.18
				(0.32)	(0.49)	(0.51)
Land cultivated p.c.		-0.14	-0.13		-0.12	-0.11
		(0.11)	(0.11)		(0.12)	(0.12)
Land owned p.c.		0.026	0.014		0.014	0.0047
		(0.12)	(0.13)		(0.13)	(0.13)
Draught cattle p.c.		0.035	0.10		0.0044	0.062
		(0.17)	(0.18)		(0.18)	(0.19)
Sheeps, pigs, goats p.c.		0.0064	0.0070		0.0099	0.014
		(0.058)	(0.060)		(0.055)	(0.056)
Rabbit & poultry p.c.		-0.017	-0.025		-0.011	-0.014
		(0.057)	(0.062)		(0.054)	(0.059)
Wealth Index		-0.011	-0.011		-0.011	-0.010
		(0.011)	(0.011)		(0.011)	(0.011)
Household size		-0.036	-0.039		-0.026	-0.027
		(0.023)	(0.025)		(0.023)	(0.025)
Children below 5 yrs		0.0051	0.0050		0.0045	0.0048
		(0.0047)	(0.0049)		(0.0052)	(0.0055)
MDM registration		0.12	0.13		0.14	0.16
		(0.14)	(0.15)		(0.13)	(0.15)
MGNREGS registration		-0.18	-0.28		-0.17	-0.25
		(0.20)	(0.22)		(0.18)	(0.20)
Share irrigated land			0.40			0.49
			(0.35)			(0.37)
Drinking Water Facilities			0.083			-0.060
			(0.20)			(0.22)
Sewerage Facilities			-0.12			-0.22
			(0.52)			(0.47)
Observations	1354	970	874	1354	970	874
R^2	0.34	0.35	0.34	0.36	0.38	0.38

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 8: FE-2SLS Estimations of Naxal-Related Violence on WAZ with **Severe** Drought

	(1) WAZ	(2) WAZ	(3) WAZ	(4) WAZ	(5) WAZ	(6) WAZ
Round	-0.29***	-0.36***	-0.36***	-0.28***	-0.37***	-0.37***
	(0.055)	(0.066)	(0.080)	(0.059)	(0.074)	(0.083)
Severe drought	-0.12*	-0.031	-0.0010	-0.20***	-0.071	-0.048
	(0.065)	(0.068)	(0.061)	(0.075)	(0.090)	(0.088)
Illness	0.077	0.058	0.019	0.10	0.14	0.095
	(0.057)	(0.067)	(0.074)	(0.091)	(0.12)	(0.12)
Round x violence	-0.40***	-0.41***	-0.44***	-0.50***	-0.41***	-0.43***
	(0.12)	(0.13)	(0.13)	(0.12)	(0.12)	(0.12)
Severe drought x violence				0.36***	0.17	0.16
				(0.14)	(0.16)	(0.17)
Illness x violence				-0.14	-0.31	-0.26
				(0.32)	(0.36)	(0.36)
Land cultivated p.c.		-0.021	-0.023		-0.0090	-0.013
		(0.069)	(0.072)		(0.078)	(0.080)
Land owned p.c.		-0.021	-0.033		-0.030	-0.040
		(0.076)	(0.078)		(0.079)	(0.080)
Draught cattle p.c.		0.037	0.041		0.041	0.045
		(0.10)	(0.10)		(0.10)	(0.11)
Sheeps, pigs, goats p.c.		-0.0010	-0.0056		-0.0021	-0.0070
		(0.029)	(0.030)		(0.029)	(0.030)
Rabbit & poultry p.c.		-0.065	-0.065		-0.062	-0.064
		(0.041)	(0.041)		(0.041)	(0.041)
Wealth Index		-0.0068	-0.0065		-0.0068	-0.0066
		(0.0058)	(0.0056)		(0.0057)	(0.0055)
Household size		-0.0046	-0.0035		-0.0069	-0.0056
		(0.014)	(0.015)		(0.014)	(0.015)
Children below 5 yrs		-0.0027*	-0.0025		-0.0024	-0.0024
		(0.0015)	(0.0016)		(0.0016)	(0.0016)
MDM registration		0.11	0.086		0.10	0.084
		(0.068)	(0.072)		(0.068)	(0.072)
MGNREGS registration		-0.073	-0.061		-0.067	-0.060
		(0.086)	(0.086)		(0.085)	(0.084)
Share irrigated land			0.10			0.083
			(0.29)			(0.29)
Drinking Water Facilities			-0.17*			-0.15
			(0.10)			(0.11)
Sewerage Facilities			0.27**			0.28**
			(0.12)			(0.13)
Observations	1690	1218	1110	1690	1218	1110
R^2	0.20	0.23	0.24	0.20	0.24	0.24

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 9: First stage of the FE-2SLS Estimations of Naxal-Related Violence on HAZ with **Severe** Drought

Corresponding columns in table 7	(1)	(2)	(3)	(4)	(5)	(6)
Endogenous Variable:				Round x Naxal-related violence		
Round x share forest	1.41***	1.22***	1.13***	1.50***	1.27***	1.22***
	(0.16)	(0.23)	(0.24)	(0.06)	(0.10)	(0.11)
Drought x share forest				-0.07	0.10	0.00
				(0.46)	(0.44)	(0.48)
Illness x share forest				-0.24*	-0.38**	-0.34**
				(0.13)	(0.15)	(0.14)
F Statistic of Instruments	76.81	27.56	21.84	223.56	85.88	52.43
p-value of F Statistic	0.00	0.00	0.00	0.00	0.00	0.00
Shea Partial R^2	0.42	0.30	0.27	0.79	0.77	0.75
Endogenous Variable:				Drought x Naxal-related violence		
Round x share forest				-0.03	-0.20**	-0.25**
				(0.02)	(0.08)	(0.11)
Drought x share forest				1.43***	1.60***	1.50***
				(0.45)	(0.44)	(0.48)
Illness x share forest				-0.23*	-0.36**	-0.32**
				(0.12)	(0.14)	(0.13)
F Statistic of Instruments				7.56	8.55	8.09
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.46	0.52	0.46
Endogenous Variable:				Illness x Naxal-related violence		
Round x share forest				-0.02	-0.05	-0.07
				(0.05)	(0.05)	(0.06)
Drought x share forest				-0.13	-0.07	-0.13
				(0.17)	(0.15)	(0.18)
Illness x share forest				1.31***	1.17***	1.17***
				(0.22)	(0.23)	(0.22)
F Statistic of Instruments				137.03	27.19	29.17
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.35	0.28	0.28
Kleibergen-Paap rk LM statistic	4.81	5.80	5.82	1.86	1.89	1.51
Kleibergen-Paap rk LM p-value	0.028	0.016	0.016	0.173	0.169	0.219
Observations	1354	970	874	1354	970	874

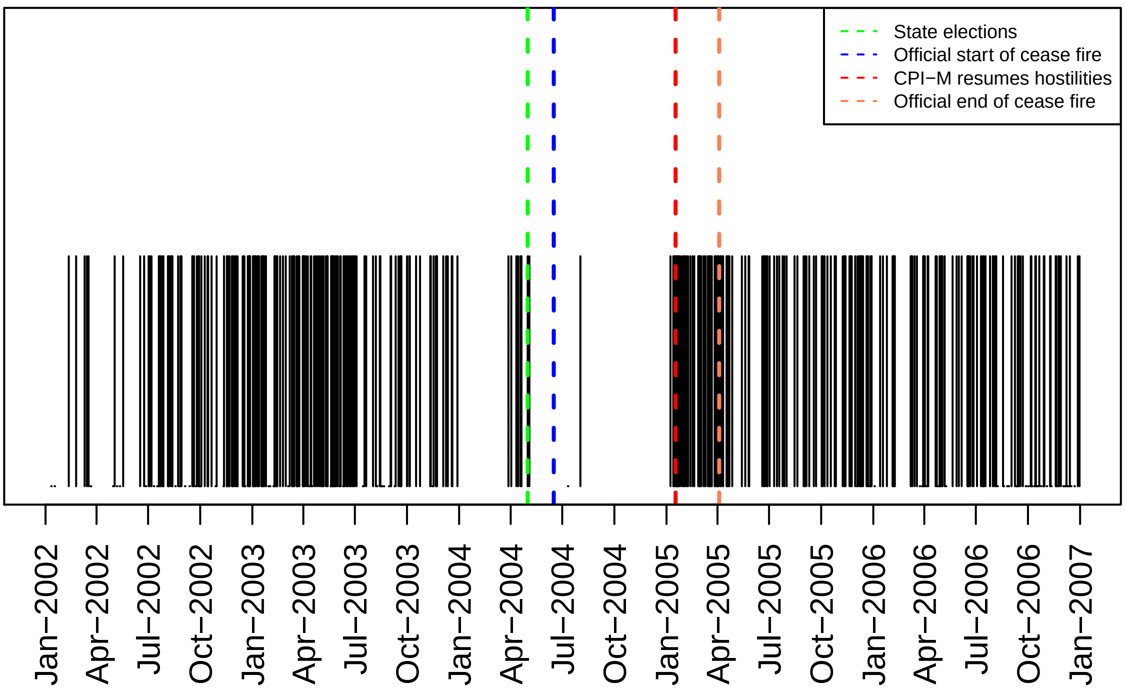
Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 10: First stage of the FE-2SLS Estimations of Naxal-Related Violence on WAZ with **Severe** Drought

Corresponding columns in table 8	(1)	(2)	(3)	(4)	(5)	(6)
Endogenous Variable:			Round x Naxal-related violence			
Round x share forest	1.45***	1.25***	1.15***	1.48***	1.24***	1.17***
	(0.17)	(0.24)	(0.24)	(0.07)	(0.11)	(0.12)
Drought x share forest				0.07	0.18	0.08
				(0.43)	(0.41)	(0.44)
Illness x share forest				-0.24*	-0.26**	-0.22*
				(0.13)	(0.12)	(0.11)
F Statistic of Instruments	69.64	27.10	22.25	159.96	74.20	59.16
p-value of F Statistic	0.00	0.00	0.00	0.00	0.00	0.00
Shea Partial R^2	0.44	0.31	0.27	0.76	0.70	0.67
Endogenous Variable:			Drought x Naxal-related violence			
Round x share forest				-0.03	-0.21***	-0.27***
				(0.03)	(0.07)	(0.09)
Drought x share forest				1.57***	1.68***	1.60***
				(0.42)	(0.40)	(0.43)
Illness x share forest				-0.24*	-0.27**	-0.23**
				(0.12)	(0.12)	(0.11)
F Statistic of Instruments				9.86	12.21	11.37
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.54	0.56	0.51
Endogenous Variable:			Illness x Naxal-related violence			
Round x share forest				0.01	-0.06	-0.07
				(0.06)	(0.06)	(0.06)
Drought x share forest				-0.10	-0.07	-0.11
				(0.16)	(0.15)	(0.17)
Illness x share forest				1.36***	1.27***	1.26***
				(0.23)	(0.22)	(0.22)
F Statistic of Instruments				260.59	54.45	51.69
p-value of F Statistic				0.00	0.00	0.00
Shea Partial R^2				0.38	0.33	0.33
Kleibergen-Paap rk LM statistic	4.61	5.47	5.61	2.05	2.09	1.77
Kleibergen-Paap rk LM p-value	0.032	0.019	0.018	0.152	0.148	0.183
Observations	1690	1218	1110	1690	1218	1110

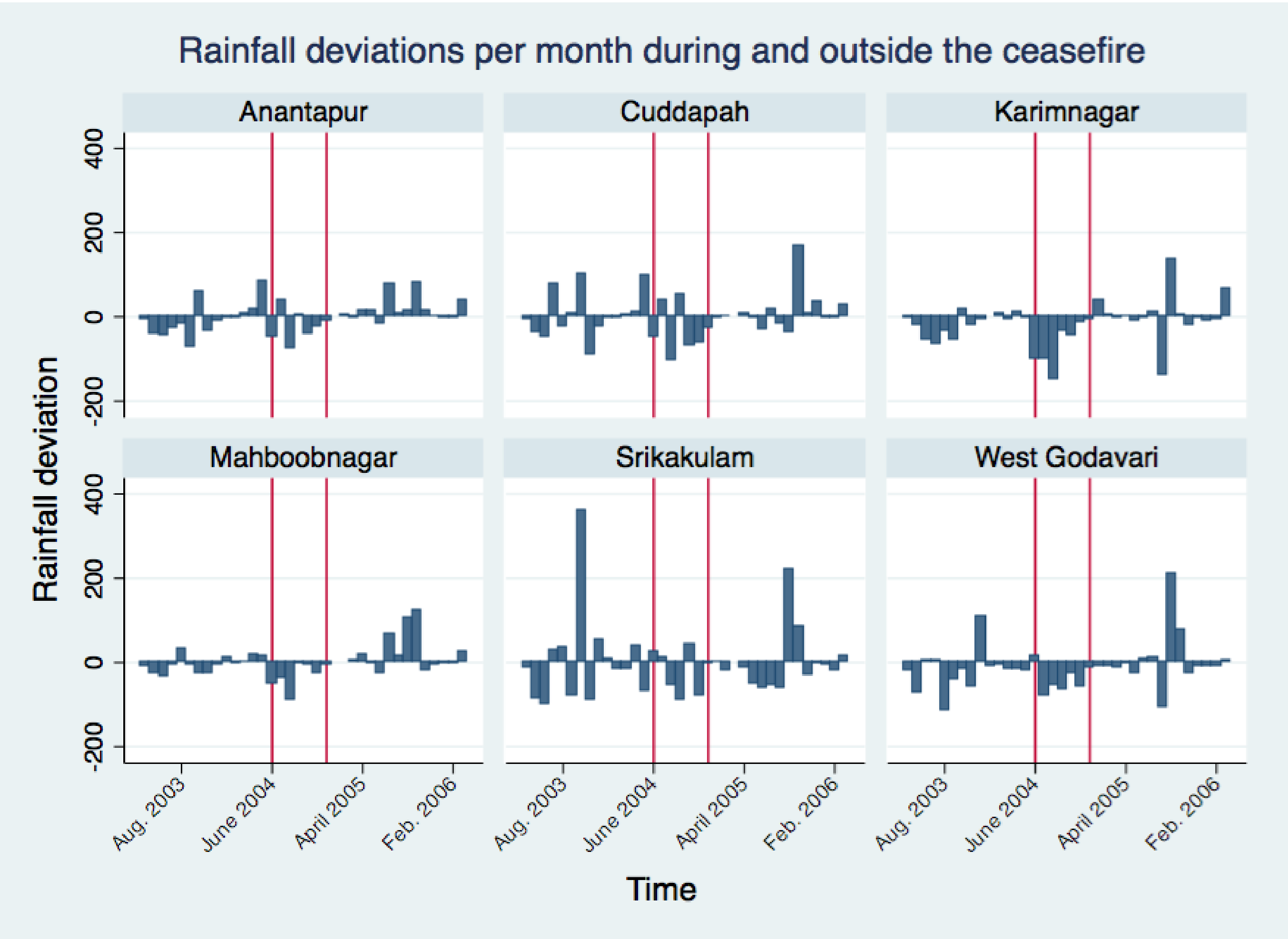
Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Figure 5: Monthly Presence of Naxal-Related Violent Events, 2002-2006



Source: Authors' calculations based on SATP data. Violent events are defined as (i) an attack by Naxals on people, (ii) an attack by Naxals on property or (iii) an "encounter" by the police against Naxals. The graph displays a vertical bar if at least one of the aforementioned events occurred in the given month.

Figure 6: Monthly Rainfall Deviations, 2002-2006



Source: Indiastat.

Table 11: DID Estimations of the Impact of Drought on HAZ During and Outside the Ceasefire

	(1) Non Naxal Mandals	(2) Naxal Mandals	(3) Non Naxal Mandals	(4) Naxal Mandals	(5) Non Naxal Mandals	(6) Naxal Mandals
Drought 2004-2006	-0.14	-0.92	0.080	-1.29**	0.15	-1.74***
	(0.17)	(0.55)	(0.16)	(0.54)	(0.16)	(0.36)
Drought 2004-2006 x Ceasefire	-0.021	-0.049	-0.16	0.34	-0.19	0.84*
	(0.19)	(0.57)	(0.18)	(0.57)	(0.18)	(0.45)
Round	-0.44***	-0.29**	-0.62***	-0.043	-0.59***	-0.12
	(0.10)	(0.13)	(0.12)	(0.30)	(0.14)	(0.30)
Illness	-0.079	-0.47**	-0.092	-0.55*	-0.10	-0.32*
	(0.11)	(0.21)	(0.13)	(0.28)	(0.13)	(0.17)
Land cultivated p.c			-0.18	0.094	-0.14	0.024
			(0.20)	(0.096)	(0.20)	(0.068)
Land owned p.c			0.021	-0.50**	0.015	-0.42**
			(0.18)	(0.18)	(0.18)	(0.19)
Draught cattle p.c			0.053	0.48**	0.065	0.34
			(0.059)	(0.20)	(0.064)	(0.30)
Sheeps, pigs & goats p.c			0.0014	-0.0075	0.0054	-0.016
			(0.051)	(0.025)	(0.052)	(0.029)
Rabbit & poultry p.c			-0.0024	-0.048	0.0043	-0.032
			(0.082)	(0.094)	(0.084)	(0.086)
Wealth Index			-0.0098	0.51	-0.0090	0.49
			(0.011)	(1.00)	(0.011)	(0.90)
Household size			-0.0047	-0.041	-0.012	-0.056
			(0.029)	(0.045)	(0.029)	(0.048)
Number of children below 5 years			0.013**	-0.0078	0.013**	-0.013***
			(0.0057)	(0.0050)	(0.0056)	(0.0023)
MDM registration			0.23*	-0.0092	0.24*	-0.10
			(0.13)	(0.31)	(0.12)	(0.32)
MGNREGS registration			-0.0048	-0.40	-0.056	-0.39
			(0.16)	(0.26)	(0.16)	(0.31)
Share irrigated land					0.57	1.37
					(0.37)	(1.97)
Drinking Water Facilities					-0.19	
					(0.17)	
Sewerage Facilities					-0.44	
					(0.37)	
Observations	1775	440	1495	373	1414	360
R^2	0.17	0.50	0.18	0.62	0.19	0.68

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 12: DID Estimations of the Impact of Severe Drought on HAZ During and Outside the Ceasefire

	(1) Non Naxal Mandals	(2) Naxal Mandals	(3) Non Naxal Mandals	(4) Naxal Mandals	(5) Non Naxal Mandals	(6) Naxal Mandals
Severe Drought 2004-2006	-0.62***	-1.58***	-0.20	-1.86***	-0.095	-1.77***
	(0.14)	(0.18)	(0.17)	(0.37)	(0.20)	(0.33)
Severe Drought 2004-2006 × Ceasefire	0.23	0.67**	-0.035	1.05*	-0.079	1.06*
	(0.15)	(0.28)	(0.15)	(0.50)	(0.19)	(0.51)
Round	-0.47***	-0.31**	-0.60***	0.031	-0.58***	-0.073
	(0.11)	(0.12)	(0.14)	(0.50)	(0.16)	(0.46)
Illness	0.036	-0.36	0.00042	-0.38	-0.017	-0.36
	(0.12)	(0.21)	(0.15)	(0.25)	(0.16)	(0.25)
Land cultivated p.c			-0.33	0.050	-0.30	0.046
			(0.24)	(0.075)	(0.23)	(0.079)
Land owned p.c			0.16	-0.29	0.16	-0.29
			(0.20)	(0.25)	(0.21)	(0.25)
Draught cattle p.c			0.042	0.13	0.11	0.15
			(0.23)	(0.24)	(0.24)	(0.28)
Sheeps, pigs & goats p.c			0.019	-0.0025	0.027	-0.0016
			(0.074)	(0.030)	(0.073)	(0.029)
Rabbit & poultry p.c			-0.038	-0.0036	-0.029	-0.0082
			(0.083)	(0.083)	(0.086)	(0.083)
Wealth Index			-0.010	-0.026	-0.0094	-0.095
			(0.011)	(0.78)	(0.011)	(0.87)
Household size			-0.012	-0.11*	-0.020	-0.11*
			(0.036)	(0.052)	(0.037)	(0.052)
Number of children below 5 years			0.0100	-0.013***	0.011*	-0.013***
			(0.0060)	(0.0017)	(0.0060)	(0.0017)
MDM registration			0.20	-0.14	0.21	-0.16
			(0.17)	(0.43)	(0.17)	(0.45)
MGNREGS registration			-0.14	-0.37	-0.21	-0.36
			(0.20)	(0.46)	(0.20)	(0.46)
Share irrigated land					0.50	1.31
					(0.38)	(2.27)
Drinking Water Facilities					-0.080	
					(0.18)	
Sewerage Facilities					-0.25	
					(0.44)	
Observations	1188	295	980	258	913	257
R^2	0.24	0.61	0.26	0.70	0.26	0.70

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 13: DID Estimations of the Impact of Drought on WAZ During and Outside the Ceasefire

	(1) Non Naxal Mandals	(2) Naxal Mandals	(3) Non Naxal Mandals	(4) Naxal Mandals	(5) Non Naxal Mandals	(6) Naxal Mandals
Drought 2004-2006	0.017	0.15*	0.17	0.049	0.21**	0.14
	(0.11)	(0.084)	(0.10)	(0.11)	(0.10)	(0.12)
Drought 2004-2006 × Ceasefire	-0.16	0.16*	-0.26**	0.29***	-0.28**	0.34***
	(0.11)	(0.086)	(0.12)	(0.090)	(0.12)	(0.082)
Round	-0.26***	-0.80***	-0.38***	-0.73***	-0.36***	-0.82***
	(0.055)	(0.083)	(0.066)	(0.18)	(0.071)	(0.17)
Illness	0.0077	-0.054	-0.017	-0.12	-0.051	-0.078
	(0.071)	(0.14)	(0.078)	(0.15)	(0.080)	(0.15)
Land cultivated p.c			0.037	-0.023	0.036	-0.045
			(0.12)	(0.042)	(0.12)	(0.037)
Land owned p.c			-0.097	-0.13	-0.10	-0.12
			(0.10)	(0.084)	(0.10)	(0.093)
Draught cattle p.c			-0.036	0.32**	-0.032	0.41**
			(0.041)	(0.13)	(0.037)	(0.15)
Sheeps, pigs & goats p.c			0.013	-0.0043	0.0078	-0.0067
			(0.026)	(0.034)	(0.026)	(0.034)
Rabbit & poultry p.c			-0.035	-0.15***	-0.027	-0.17***
			(0.050)	(0.032)	(0.050)	(0.030)
Wealth Index			-0.0036	-0.31	-0.0031	-0.46
			(0.0061)	(0.44)	(0.0059)	(0.48)
Household size			-0.00059	-0.066***	-0.0023	-0.074***
			(0.017)	(0.020)	(0.017)	(0.020)
Number of children below 5 years			-0.0010	-0.0045***	-0.00092	-0.0050***
			(0.0020)	(0.00080)	(0.0020)	(0.00091)
MDM registration			0.13	0.0025	0.11	-0.080
			(0.079)	(0.085)	(0.080)	(0.062)
MGNREGS registration			0.020	-0.13	0.0062	-0.16
			(0.083)	(0.12)	(0.075)	(0.11)
Share irrigated land					0.20	2.38**
					(0.30)	(0.87)
Drinking Water Facilities					-0.24**	
					(0.11)	
Sewerage Facilities					0.14	
					(0.12)	
Observations	1933	497	1651	430	1566	417
R^2	0.092	0.39	0.11	0.51	0.11	0.52

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 14: DID Estimations of the Impact of Severe Drought on WAZ During and Outside the Ceasefire

	(1) Non Naxal Mandals	(2) Naxal Mandals	(3) Non Naxal Mandals	(4) Naxal Mandals	(5) Non Naxal Mandals	(6) Naxal Mandals
Severe Drought 2004-2006	-0.13	0.096	-0.051	-0.022	-0.048	0.12
	(0.18)	(0.085)	(0.16)	(0.14)	(0.12)	(0.11)
Severe Drought 2004-2006 × Ceasefire	-0.052	0.13**	-0.016	0.27***	-0.0024	0.29***
	(0.18)	(0.050)	(0.17)	(0.088)	(0.13)	(0.084)
Round	-0.27***	-0.81***	-0.42***	-0.52**	-0.42***	-0.70***
	(0.057)	(0.086)	(0.078)	(0.18)	(0.090)	(0.20)
Illness	0.094	0.00080	0.067	-0.062	0.034	-0.026
	(0.075)	(0.17)	(0.087)	(0.20)	(0.095)	(0.19)
Land cultivated p.c			-0.055	-0.018	-0.066	-0.025
			(0.15)	(0.047)	(0.16)	(0.046)
Land owned p.c			0.021	-0.059	0.022	-0.057
			(0.14)	(0.14)	(0.14)	(0.15)
Draught cattle p.c			-0.18	0.29**	-0.18	0.33**
			(0.13)	(0.13)	(0.13)	(0.15)
Sheeps, pigs & goats p.c			-0.0062	0.0028	-0.0100	0.0030
			(0.037)	(0.056)	(0.038)	(0.055)
Rabbit & poultry p.c			-0.064	-0.14**	-0.057	-0.15**
			(0.058)	(0.054)	(0.056)	(0.055)
Wealth Index			-0.0076	-0.53	-0.0075	-0.63
			(0.0060)	(0.45)	(0.0057)	(0.46)
Household size			0.0064	-0.071**	0.0076	-0.072**
			(0.021)	(0.026)	(0.021)	(0.026)
Number of children below 5 years			-0.0030	-0.0047***	-0.0033	-0.0047***
			(0.0022)	(0.0012)	(0.0023)	(0.0012)
MDM registration			0.17*	-0.12*	0.13	-0.15**
			(0.092)	(0.055)	(0.093)	(0.049)
MGNREGS registration			-0.070	-0.28**	-0.071	-0.25*
			(0.10)	(0.12)	(0.085)	(0.12)
Share irrigated land					0.15	2.51***
					(0.28)	(0.76)
Drinking Water Facilities					-0.13	
					(0.11)	
Sewerage Facilities					0.33***	
					(0.12)	
Observations	1300	344	1090	307	1019	306
R^2	0.10	0.43	0.14	0.56	0.15	0.56

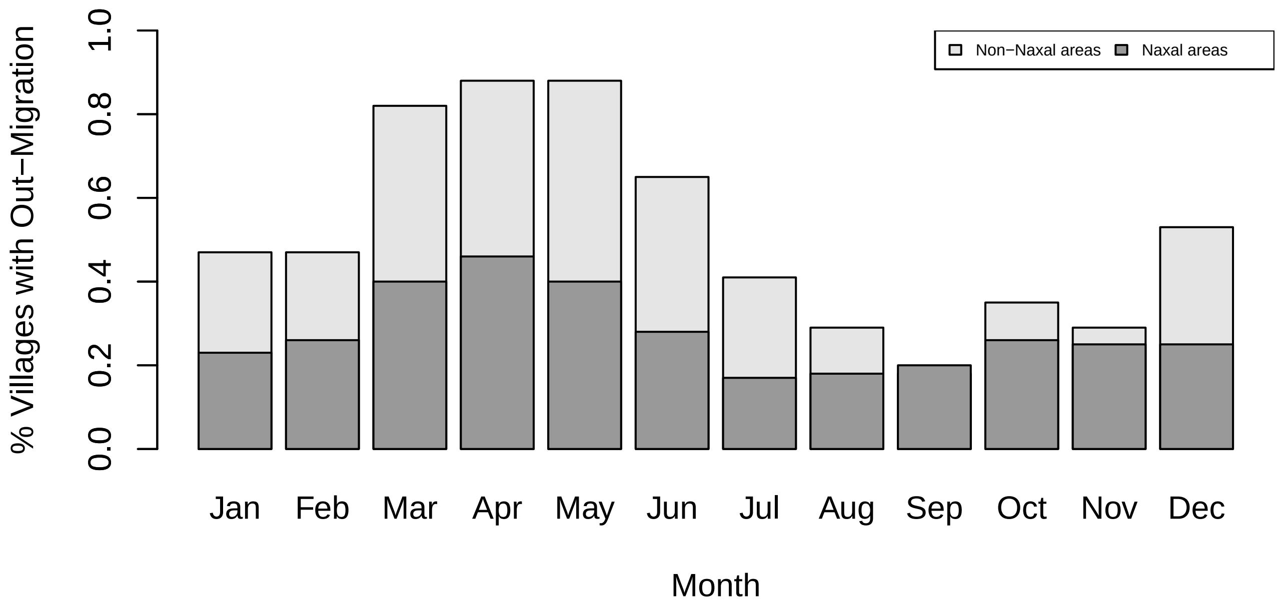
Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at village level.

Table 15: Proportion of Households Using Selected Coping Strategies in Response to Drought in Peaceful and Conflict-Affected Mandals

Coping Strategy	Non-Naxal Mandals	Naxal Mandals	Difference (p-value)
Used credit	0.238	0.257	-0.0196 (0.644)
Migrated	0.174	0.146	0.0274 (0.451)
Worked more	0.143	0.105	0.0381 (0.246)
Bought less	0.023	0.053	-0.030* (0.094)
Nothing	0.158	0.047	0.112*** (0.000)
Aid from government/NGO	0.023	0.094	-0.0709*** (0.001)
Insurance paid	0.042	0.070	-0.0287 (0.192)
Ate less	0.004	0.058	-0.0547*** (0.000)
Aid from community	0.030	0.047	-0.0166 (0.369)
Aid from friends & family	0.091	0.053	0.0379 (0.144)
Used savings	0.049	0.035	0.014 (0.487)
Observations	265	171	436

Source: authors' calculations based on Young Lives data. * 0.10 ** 0.05 *** 0.01

Figure 7: Overlaid Graph of Monthly Rates of Village Out-Migration in Peaceful and Conflict-Affected Mandals



Source: authors' calculations based on the Young Lives data.

Table 16: Proportion of Households Accessing and Satisfied by Food Aid and Sanitation Services and Selected Health Indicators in Peaceful and Conflict-Affected Mandals

	Non-Naxal Mandals	Naxal Mandals	Difference (p-value)
Recipient of food aid	0.890	0.863	0.027
			(0.022)
Food aid money goes directly to the child	0.357	0.249	0.108***
			(0.002)
Satisfied with food aid	0.657	0.557	0.101***
			(0.004)
Access to sanitation services	0.367	0.103	0.264***
			(0.000)
YL child has a vaccination card	0.499	0.245	0.254***
			(0.000)
YL child is immunised against meningitis	0.383	0.304	0.079**
			(0.018)
YL child had severe disease	0.319	0.384	-0.065**
			(0.043)

Source: authors' calculations based on the Young Lives data. * 0.10 ** 0.05 *** 0.01