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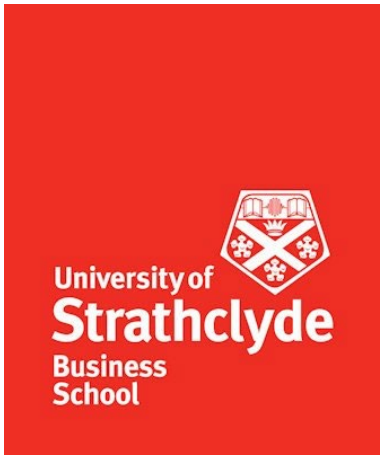

Political Accountability and the Returns to Peace

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Abstract

Why do some economies recover from armed conflict much better than others? We provide evidence that political accountability determines whether post-conflict societies realize the peace dividend. We study Cambodia, where a nationwide landmine clearance campaign created large local potential surpluses by freeing arable land and reducing victimization by 48%. Whether these surpluses translate into realized development depends on accountability. Using a staggered difference-in-differences strategy, we show that clearance raises the probability of any nightlights by 7.3 percentage points in areas with strong pre-existing demand for checks and balances on political elites. Where such demand is weak, the effect is close to zero. Elite capture explains the divergence. In low-accountability areas, clearance increases land concessions, deforestation, land disputes, and labor displacement. Where accountability is strong, clearance instead raises household consumption by 22%. Post-conflict recovery requires not just the existence of a peace dividend but political constraints on its capture.

JEL classification: D72, D73, D74, O43, Q15

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1 Introduction

How well economies recover from armed conflict varies widely across contexts. On average, a country with a history of civil war is more likely than not to experience renewed conflict and economic stagnation (Collier et al., 2003). Yet many countries have recovered rapidly following conflict (Miguel and Roland, 2011; Hodler, 2019), consistent with standard models of convergence (Solow, 1956; Davis and Weinstein, 2002). What determines whether a society recovers from conflict or stagnates?

We study political accountability as a determinant of post-conflict recovery. When political elites face no checks and balances, they could capture the economic returns to peace, hindering broad-based development. Their accountability could thus determine whether the "peace dividend," the potential economic opportunities arising from post-conflict stabilization (Rohner and Thoenig, 2021), is distributed equitably. An equitable distribution promotes development and raises the opportunity cost of fighting (Dube and Vargas, 2013). Concentrating the returns among a narrow elite stifles long-run growth (North and Weingast, 1989; Djankov et al., 2003) and reignites conflict by impeding peaceful bargaining over surplus (Garfinkel and Skaperdas, 2007). Yet whether accountability matters in practice is not obvious. If restoring capital and land destroyed during conflict translates mechanically into development, as standard convergence models predict, recovery should occur regardless of local institutions and the distribution of the peace dividend. Empirical evidence on the institutional determinants of post-conflict recovery remains scarce (Rohner and Thoenig, 2021).

Testing these predictions is challenging. The peace dividend is a latent variable, typically observed only when it translates into realized development. When elites capture the peace dividend, it appears never to have existed, remaining what Rohner and Thoenig (2021) call

"elusive." Moreover, accountability and development may be jointly determined (Lipset, 1959), and both could be driven by unobserved factors such as access to natural resources (Robinson et al., 2006).

We address these empirical challenges in Cambodia, where the staggered rollout of a nationwide landmine clearance campaign, the country's largest post-conflict development program, provides highly visible and plausibly exogenous shocks to the latent peace dividend. Comparing communes where mines were cleared to those that remained contaminated, in places with more and less pre-existing political accountability, we test whether the peace dividend translates into development depending on whether elites face checks and balances. Because international organizations directed the clearance campaign, its rollout is plausibly independent of local political accountability. We find that clearance raises the probability of any nightlights by 7.3 percentage points where accountability is strong. The effect is close to zero where it is weak.

While clearance creates potential surplus, local political accountability shapes who benefits. Following decades of conflict, landmines had made vast areas of agricultural land unusable.[1] Their removal expands the supply of arable land, generating substantial potential gains for the largely agrarian population. But the sudden increase in land availability also creates opportunities for elite capture. Following the genocide by the Khmer Rouge in 1975–1979 and the subsequent armed conflict with Vietnam and Thailand until 1991, Cambodia today remains ruled by a consolidated elite in a weak institutional environment (Bühler and Madestam, 2026). Yet communes differ in the degree of checks and balances placed on political elites which raise the cost of capture.

We measure pre-existing political accountability in two ways. Our first proxy is the share of farmers in a commune with letters of possession, informal documents issued by

[1] Cambodia was the world's most heavily landmine-contaminated country until only recently, when it was surpassed by Ukraine (Landmine and Cluster Munition Monitor, 2024).

village and commune chiefs recognizing land occupancy. Their prevalence reflects how actively communities engaged with local leaders to establish informal records and checks on authority after the Khmer Rouge had destroyed all formal governance (Hem, 2019; Bühler and Madestam, 2026). Letters carry no collateral value, making their prevalence unlikely to reflect differences in land values or economic potential. As the second proxy, we use a historical driver of political accountability based on Bühler and Madestam (2026). Transient rainfall shocks during the Khmer Rouge period (1975–1979) locally intensified repression and dismantled social trust, creating a compensatory demand for documented, formal checks on power. This variation is plausibly exogenous to long-run economic productivity or conflict.

Our identification strategy exploits two institutionally unrelated natural experiments in Cambodia. While clearance timing was set top-down by international organizations, independently of local political conditions, Cambodian communes differ significantly in the historical degree of accountability of political elites. These differences emerged bottom-up from communities' experiences under the Khmer Rouge. We carefully validate three key assumptions. First, clearance constitutes an exogenous shock to potential surplus. Second, clearance timing is orthogonal to pre-existing accountability. Third, the returns to clearance are not driven by other correlates of accountability or existing local trends. Commune fixed effects absorb all time-invariant differences between high- and low-accountability communes, so identification does not require that the two types of communes are comparable in levels. Province-year fixed effects absorb differential trends at the province level, the administrative level at which clearance priorities were set.

We first establish that clearance creates local potential surplus. Using a staggered difference-in-differences strategy (following Borusyak et al. (2024) and Chiovelli et al. (2025)), we show that clearance reduces civilian casualties by 48% on average, consistent with an expansion of agricultural potential and human capital (Lekfuangfu, 2022). Importantly,

this effect holds in both low- and high-accountability communes, and we find no anticipation effects or differential pre-trends.

Do these latent local peace dividends translate into economic development? If clearance simply removes a physical barrier to production, standard models predict economic convergence regardless of local institutions. Yet newly available land may activate elite capture, so development could depend on whether political elites face checks and balances. Our main results support the latter. In communes with high political accountability, landmine clearance raises the probability of any nightlights by 7.3 percentage points. In communes with low accountability, clearance produces substantially smaller economic gains.

These results hold when we replace our main accountability measure with the alternative proxy based on transient Khmer Rouge-era rainfall shocks, addressing the possibility that our findings reflect latent economic potential rather than accountability. Differential pre-trends across communes based on accountability and its correlates do not explain the results. Clearance does not significantly increase market access in our setting, inconsistent with trade linkages as an alternative channel. The results are also robust across alternative specifications, accountability definitions, and a rich set of economic and geographic controls.

We provide evidence that traces this divergence to elite capture. Cambodia's Economic Land Concessions (ELCs), large-scale, long-term leases granted by the central state to politically connected actors through opaque processes, provide a directly observable measure of rent extraction (Diepart and Schoenberger, 2016; Wang et al., 2023). In low-accountability communes, clearance increases ELCs, reduces forest cover, increases land disputes, and reduces household hours worked, consistent with displacement rather than increased economic opportunities for local residents. In contrast, in high-accountability communes, clearance raises household consumption without increasing concessions or land disputes. In sum, checks and balances on elites constrain capture and channel the peace dividend towards

households. Without them, post-conflict recovery is captured rather than realized.

These findings speak to a central question in the conflict literature: why do some post-conflict societies recover while others fail? We provide evidence that the answer depends on political accountability. A large literature studies the economic causes and consequences of conflict (e.g., Abadie and Gardeazabal, 2003; Collier et al., 2003; Blattman and Miguel, 2010; Miguel and Roland, 2011; Verwimp et al., 2019; McGuirk and Nunn, 2025; Riano and Valencia Caicedo, 2024). Recent work has turned to estimating the impacts of specific post-conflict policies (Rohner et al., 2025), including landmine clearance in Mozambique (Chiovelli et al., 2025) and Colombia (Prem et al., 2025), and security transitions in Afghanistan (Fetzer et al., 2021). In many post-conflict settings, the peace dividend has remained "elusive" (Rohner and Thoenig, 2021), in part because a dividend that is captured rather than realized is indistinguishable from no dividend at all. In our context, the observable creation of surplus and elite capture through landmine clearance makes it possible to verify that a peace dividend exists even where it fails to produce development, and to show that it is captured where political elites face few checks and balances.

These results also speak to the political economy of autocracies and weak democracies. We show that even development policies designed to benefit the broader population and implemented effectively can activate elite capture when accountability is absent. A large literature studies how weak institutions allow elites to distort economic outcomes (e.g., Shleifer and Vishny, 1993; Reinikka and Svensson, 2004; Acemoglu, 2005; Olken, 2007; North et al., 2009; Burgess et al., 2012; Martinez-Bravo et al., 2017; Andersen et al., 2022; Bühler and Madestam, 2026). Much of the existing evidence focuses on resource windfalls under the control of an autocratic regime, which produce divergent outcomes depending on institutional quality (Mehlum et al., 2006), fuel political violence where institutions are weak (Fetzer and Kyburz, 2024), and fail to raise living standards when local elites

capture the rents (Caselli and Michaels, 2013). Our setting extends this logic to development policies that should provide direct benefits to broad segments of the population. Moreover, because the Khmer Rouge had dismantled virtually all formal institutions and the variation in accountability we study is entirely bottom-up and highly localized, we can study its role independently of nation-wide state capacity, market functioning, and other institutional features that typically confound this relationship.

Finally, we contribute to work on extractive institutions and land concessions (e.g., Banerjee and Iyer, 2005; Goldstein and Udry, 2008; Dell and Olken, 2020; Lowes and Montero, 2021; Méndez and Van Patten, 2022) by documenting their origins in addition to their consequences. This literature has primarily studied the persistent effects of historical extractive arrangements on contemporary outcomes. We document a different phenomenon. The sudden release of productive land triggers new extractive concessions, and accountability determines whether this land is used productively or captured. Our results suggest that extractive institutions can emerge rapidly when a wealth shock meets weak constraints on political elites.

2 Conceptual Framework

The end of armed conflict creates economic potential. When capital and land that were destroyed or inaccessible are restored, a "peace dividend" emerges (Rohner and Thoenig, 2021). Standard convergence models predict that this potential translates mechanically into growth as economies rebuild toward their steady state (Solow, 1956; Davis and Weinstein, 2002). Yet many post-conflict countries stagnate or even relapse into violence despite unrealized potential (Collier et al., 2003). The realization of the peace dividend is not guaranteed.

We argue that a key reason is the accountability of political elites. The peace dividend exists regardless of institutions, but its consequences depend on who controls the newly available resources. Where elites face checks and balances, surplus reaches households and generates development. Where accountability is weak, the same surplus is vulnerable to capture, resulting in economic stagnation. This logic yields three predictions. First, the removal of a physical barrier to production, such as landmines, creates potential surplus regardless of accountability. Second, this surplus translates into realized development contingent on whether political elites face checks and balances. Third, where accountability is weak, surplus is associated with capture and conflict over newly valuable resources.

Figure 1 illustrates this logic. It also highlights why studying average effects of post-conflict policies can provide an incomplete picture. A null or small average effect on realized and observed development may mask a dividend that was created but diverted. Testing whether accountability matters thus requires a setting where the creation of surplus is observable independently of its distribution, so that we can verify a peace dividend was generated regardless of whether it resulted in development or capture.

Why do we focus on accountability specifically? In many post-conflict environments, including Cambodia, elites maintain power by restricting access to valuable resources (North et al., 2009, 2013). A positive shock to the resource base expands the pool over which elites compete, making capture the default. What can disrupt this default is a local check that raises the cost of capture. Acemoglu (2005) shows that economic development requires a balance of power between state and citizens. When constraints on elites are too weak, rulers have no incentive to channel surplus toward public goods. In Cambodia, bottom-up demands for accountability, shaped by communities' experience under the Khmer Rouge, constitute such a de facto constraint, raising the cost of capture even where de jure checks and balances are weak (Acemoglu and Robinson, 2008).

3 Background

3.1 Decades of Conflict

Cambodia has lived in the shadow of conflict for decades. Beginning in the 1960s, civil war and a large-scale US bombing campaign during the Secret War in former Indochina decimated the country's infrastructure and population.[2] The conflict culminated in the rise of the Khmer Rouge, who between 1975 and 1979 committed one of post-World War II's most devastating genocides (Chandler, 2018; Bühler and Madestam, 2026). The regime abolished private property and destroyed all related formal documentation, dismantled existing state and educational institutions, and broke down social trust through a system of surveillance and repression. Virtually all of the population was forced to work in agricultural labor camps, where 25% are estimated to have perished during this 4-year period alone (Chandler, 2018; Yimsut, 2011; Bennett, 2015).

In 1979, the economy had collapsed and the Khmer Rouge were overthrown by the Vietnamese, but remnants continued guerrilla warfare for over a decade. Both the Khmer Rouge and Vietnamese forces laid extensive minefields to deny access to military objectives (Roberts, 2011), making Cambodia one of the most mined countries in the world. By 1992, the insurgency had largely subsided and Cambodia came under UN transitional authority (Chandler, 2018). Formal state institutions, a functioning market economy, and state capacity were severely weakened by that point. However, the country-wide landmine contamination remained and hindered the productive use of land. Landmines cannot be detected or removed without special equipment, so even the suspicion of contamination can render entire areas

[2] Between 1965 and 1973, the US dropped approximately 2.7 million tons of ordnance on Cambodia, more than the Allies dropped in all of World War II (Owen and Kiernan, 2007). The bombing was geographically concentrated in the eastern provinces and is widely regarded as a factor in the Khmer Rouge's rise to power (Chandler, 2018). We control for historical bombing loads in our empirical analysis because they vary spatially and could correlate with both post-conflict recovery and landmine contamination.

economically unusable long beyond the end of active fighting.

The end of armed conflict meant that vast areas of agricultural land, previously inaccessible due to mines and insecurity, could in principle be restored to productive use. Yet Cambodia today remains one of the poorest countries in Asia.

3.2 Landmine Clearance and Accountability

We examine the interaction between two independent forces that shaped the transformation of post-conflict Cambodia. Landmine clearance, driven top-down by international organizations, removed physical barriers to land use and created local potential surplus. At the same time, local demand for political accountability emerged in the absence of formal governance, reflected by letters of possession issued bottom-up by village and commune chiefs.

Landmine clearance. In 1992, the UN established the United Nations Transitional Authority in Cambodia (UNTAC), then its largest peacekeeping operation, and initiated the first clearance operations alongside several international humanitarian organizations. Clearances were coordinated by the HALO Trust, Mines Advisory Group (MAG), and the Cambodian Mine Action Centre (CMAC), funded largely from foreign donations (Maxwell, 2001). See Appendix A for details on the organizations involved and the institutional evolution of clearance prioritization.

Clearance priorities were generally set at the provincial level on the basis of casualty rates, contamination density, and population vulnerability, with no criteria related to local economic potential or political affiliation.[3] The timing and scale of operations were further

[3] The National Mine Action Strategy set the reduction of mine casualties in the most affected communities as its primary objective. Sub-Decree No. 70 (2004) assigned priority-setting to Mine Action Planning Units (MAPUs) and Provincial Mine Action Committees (PMACs) rather than local economic planning bodies. CMAA operational guidelines further required operators to deploy 75% of assets to CMAA-designated priority communes.

shaped by international donor funding cycles and, in border regions, by diplomatic tensions with Thailand that restricted access to heavily mined areas (Lekfuangfu, 2022). Clearance operations within provinces were not systematically coordinated across operators. Figure 2 maps the locations of cleared minefields as of 2010, the end of our sample period. Clearance operations took place in over 500 communes and every province.

Political accountability. Independently, demand for political accountability emerged from below. The Khmer Rouge had destroyed all formal state institutions, cadastral records, and social networks through forced relocation, surveillance, and mass killing. An estimated quarter of the population perished (Chandler, 2018), and virtually all of the remainder were forcibly displaced. By the time stability returned in the 1990s, communities had to rebuild governance from scratch. Few formal processes existed to constrain local authorities, resolve disputes, or hold officials accountable.

In some communes, residents actively engaged with local leaders to establish informal checks on elites. Village and commune chiefs issued "letters of possession" recognizing a household's occupancy of a specific plot (Hem, 2019). These documents are not formal cadastral titles and carry no collateral value. Under Cambodian law, only titles registered with the national cadastral office can support a mortgage (Rudi et al., 2014). Their prevalence thus does not reflect differences in land values or agricultural investment potential. Rather, letters reflected a broader bottom-up demand for documentation, transparency, and checks on authority in communities where trust in institutions had been shattered.

The spatial variation in this demand was partly shaped by communities' experience under the Khmer Rouge. As Bühler and Madestam (2026) document, communes where the genocide was most intense, identified through transient weather shocks that led the regime to concentrate forced labor and repression, today exhibit systematically stronger demand for

political accountability. Residents hold stronger democratic attitudes, are better informed about politics, turn out to vote at higher rates, support the opposition by approximately 5 percentage points more in elections, and hold letters of possession at higher rates. Critically, Bühler and Madestam (2026) show that this variation is unrelated to contemporary economic conditions or conflict.

3.3 Potential for Elite Capture

Cambodia has been nominally a democracy since 1993, yet power has remained in the hands of a single authoritarian party, with widespread allegations of corruption and civil rights violations (Norén-Nilsson, 2016).[4] The 2001 Land Law exemplifies how this concentration of power shaped post-conflict governance (Diepart and Schoenberger, 2016).

The law nullified all property claims predating 1979, granted the state authority over land identified as unused, and codified the legal framework for Economic Land Concessions (ELCs). Officially, ELCs are large-scale transfers of state land to private companies for agricultural exploitation (National Assembly of Cambodia, 2001). In practice, ELCs are allocated to politically connected actors through opaque processes, widely associated with deforestation and displacement (Diepart, 2015; Pauly et al., 2022; Wang et al., 2023). While land concessions had been granted since the early 1990s (Diepart and Schoenberger, 2016), the 2001 law formalized and expanded the practice. Appendix A provides additional details on Cambodian land law and concessions.

These provisions link directly to landmine clearance. In the absence of formal documentation, property rights in Cambodia have historically been use-based. Landmines prevented continuous occupation and use, whether for cultivation, foraging, or forest access, and the law

[4] Cambodia ranks 158/180 in Transparency International's 2024 Corruption Perceptions Index (Transparency International, 2024).

classified land not in continuous use as state property. Clearance therefore removed the physical barrier to the land that communities had relied on but could no longer actively occupy. This land, already classifiable as "unused" under the Law, became physically accessible and economically attractive to concessionaires.

3.4 Accountability as a Constraint on Elite Capture

Where local demand for political accountability is strong, land concessions meet resistance. Politically engaged communities scrutinize local officials, support the opposition, and raise the reputational cost of facilitating land seizures. This political pressure constrains capture even where formal institutions offer little protection.

Letters of possession reinforce this constraint through a specific channel. An Economic Land Concession may only be granted on land registered and classified as state private land.[5] Such classification requires that no recognized private claim exists (National Assembly of Cambodia, 2001). Letters of possession, though informal, constitute evidence of legal possession under the 2001 Land Law, supporting a recognized claim that impedes reclassification as state property (Hem, 2019).[6] Beyond this legal function, letters create a paper trail signed by local officials that is visible to international monitors, raising the cost of expropriation through political pressure where they are prevalent.[7]

The informal property rights that letters establish are one channel through which bottom-up accountability operates. Documenting occupancy makes expropriation visible and contestable. But letters also provide a directly observable measure of local political accountabil-

[5] Sub-Decree No. 146 on Economic Land Concessions (2005), Article 4. The sub-decree implements the 2001 Land Law's provisions on concessions.

[6] Article 29 of the 2001 Land Law recognizes possession of immovable property held since 1989 as a right *in rem*. Article 40 authorizes the competent authorities to continue issuing titles of possession as evidence of occupancy. See also Appendix A for details.

[7] In extreme cases, international monitors withdrew funding from government projects in response to violations of documented land claims. See Appendix A for examples.

ity. Unlike voting patterns or attitudinal surveys, they record a specific interaction between citizens and local officials that leaves a verifiable paper trail. Their variation across communes captures real differences in the willingness of residents to demand checks on authority (Bühler and Madestam, 2026).

The Boeung Kak Lake case illustrates how documentation activates political pressure (see Appendix A for details). In 2007, a politically connected developer acquired a 99-year lease over the area. The government overrode thousands of documented possession claims and proceeded with evictions. Yet those documents provided a basis for international response following citizen protests. The World Bank suspended all new lending to Cambodia until the dispute was resolved, and the government ultimately issued titles to 800 affected families.[8] Where no documentation exists, no such political friction arises, lowering the barrier to capture.

4 Data

We assemble a unique yearly panel dataset covering all 1,621 communes in Cambodia from 1992 to 2010.[9] Table A.1 provides an overview of variable definitions and data sources. Table A.2 shows summary statistics. Figure A.1 maps each data source to the corresponding element of the conceptual framework.

[8] See the World Bank Inspection Panel Report on the Cambodia Land Management and Administration Project (2011) and subsequent press releases.

[9] This period guarantees consistent availability of our key outcomes and explanatory variables. Cambodia is administratively divided into 24 provinces (*khett*, excluding Phnom Penh), 194 districts (*srok*), 1,621 communes (*khum*), and 14,057 villages (*phum*). We aggregate all data at the commune level based on 2014 administrative boundaries, unless indicated otherwise. Boundary shapefiles were obtained from Open Development Cambodia: https://data.opendevelopmentcambodia.net/en/dataset/administrative-boundaries-of-cambodia-2014. Boundary shapefiles with consistent territorial designations are not available for earlier periods.

4.1 Main Treatment Variables

Our identification strategy exploits the interaction between two sources of variation: top-down landmine clearance, which generates local potential surplus, and bottom-up accountability, which shapes how that surplus is distributed. This section describes each in turn.

Landmine clearance. We source data on the location and timing of landmine clearances from the Cambodian Mine Action Centre (CMAC) and The Halo Trust (HALO), accessed through the Open Development Cambodia (ODC) website.The dataset covers all clearing operations between 1992 and 2010, including start and end dates, locations, and areas cleared. We use this information to determine whether a commune contained a minefield and when clearance was completed.[10] Around 44% of communes experience neither casualties nor clearances. Of the remaining 56%, 57% are fully cleared by 2010.[11]

Main accountability measure. Our main proxy for local accountability is the share of farming households in each commune with letters of possession issued before 2002 (earlier data are not available). These documents were issued by village and commune chiefs and reflect a pre-determined demand for checks and balances on political elites, not differences in economic conditions, as explained in the Background section. The system of letters of possession emerged independently of clearances as early as 1989, driven by communities' historical experience under the Khmer Rouge rather than by clearance activity (Bühler and Madestam, 2026). We calculate this share using the National Census of Agriculture 2013 and classify a commune as having high accountability if the share exceeds 33%.[12] This

[10] If a commune shows no recorded clearance activity or landmine-related incidents during the period for which data are available, we infer that no minefields were present.

[11] Cambodia is not fully cleared of landmines, even by the present day. See Landmine and Cluster Munition Monitor – Cambodia Report, 2022 - https://the-monitor.org/country-profile/cambodia/impact?year=2023.

[12] The census records only whether a household holds a letter of possession issued before 2002, not the exact year of issuance. Given that the system emerged in the late 1980s and spread rapidly in the early 1990s,

threshold ensures sufficient sample sizes in both groups. A higher cutoff such as 50% would leave very few high-accountability communes, while a lower threshold would dilute the contrast. As we show in Section 6.2, results are qualitatively unchanged across a wide range of alternative cutoffs as well as a continuous measure. Figure A.2 illustrates the variation in local accountability across space in our sample.

Alternative accountability proxy. We complement our main measure with an alternative proxy derived from Bühler and Madestam (2026), based on transient local productivity shocks during the Khmer Rouge period (1975–1979). Under the regime's forced labor system, temporarily more productive areas experienced more repression. Because Bühler and Madestam (2026) show that this productivity shock is unrelated to both past and contemporary economic conditions, it provides a plausible source of exogenous variation in local accountability. Consistent with their finding, we show in Table A.3 that this shock is also a strong predictor of the prevalence of letters of possession, indicating that both measures capture similar underlying variation in local checks and balances on political elites.[13]

4.2 Main Outcomes

Victimization. Victimization data serve a specific role in our analysis. A reduction in civilian casualties upon clearance provides evidence that clearance generates surplus by reducing the risk of land usage, making land more valuable and productive. Non-civilian casualties (soldiers, deminers) reflect operational exposure and can mechanically rise with clearance activity, so civilian casualties are the appropriate proxy for surplus. We obtain

most pre-2002 letters were likely issued before or around the time clearance operations began. We confirm that clearance presence, intensity, and timing do not predict the (2013-measured) letters share (Table A.4).

[13] We prefer letters of possession as our main measure because they vary continuously at the commune level. The KR-era variation captures a broader bundle of repression legacies, including reduced trust and civic participation alongside strengthened accountability (Bühler and Madestam, 2026), making it better suited as complementary verification.

data on landmine casualties from the Office for the Coordination of Humanitarian Affairs (OCHA), covering all incidents between 1979 and 2013.[14] We classify each casualty as civilian or non-civilian using an occupation-primary, landuse-fallback rule. For 1997–2004, the CMAA Casualties sheet records the victim's occupation, and we treat incidents as non-civilian only when the victim is a soldier, police officer, or mine-clearance worker. For 2005–2010, the OCHA casualty file records only the landuse at the incident site, and we treat incidents as non-civilian only when the landuse is a military or active demining site. Because this classification is not consistently available before 1997, we restrict victimization regressions to 1997–2010.[15] Communes absent from the data in a given year are assumed to have experienced no casualties. Figure A.3 summarizes victims by occupation, illustrating the severe disruption to agricultural activity and human capital accumulation caused by landmine contamination.

Local economic development. We use nighttime light intensity, a standard measure of economic activity (Gibson et al., 2021), as our main proxy for local development, following Chiovelli et al. (2025).[16] Other time-varying data on economic activity are not available at the commune level from administrative sources. We obtain satellite imagery from the harmonized DMSP series of Li et al. (2020) and apply the blooming and top-coding corrections developed

[14] The data resource was originally established by the Cambodia Mine/ERW Victim Information System (CMVIS) of the Cambodia Mine Action and Victim Assistance Authority (CMAA). Data are available through the Open Development Cambodia project: https://opendevelopmentcambodia.net/. UXOs are referred to as explosive remnants of war, or ERWs, in the original data.

[15] The smaller cluster count in the victimization regressions (1,464 communes, versus 1,613 for nightlights) reflects this restriction. Communes whose clearance was completed before 1997 provide no pre-treatment observations within the 1997–2010 window; the imputation estimator absorbs them into the commune fixed effects.

[16] In Section 7, we complement these aggregate measures with household-level data from the Cambodia Socio-Economic Survey (CSES) on hours worked and consumption expenditure, providing individual-level evidence consistent with the nightlights results.

by Chiovelli et al. (2026) and used in Chiovelli et al. (2025).[17] Our main outcome is an indicator for whether a commune has any nightlights in a given year.[18] Following Chiovelli et al. (2025), this binary measure captures extensive margin effects, which are more relevant in our context given the low base rate of electrification in communes with minefields. As complementary continuous measures, we use log nightlights and a winsorized version that removes very small values of luminosity to account for further measurement error.

4.3 Mechanisms

We collect several additional variables to examine the channels through which accountability may shape post-clearance outcomes (see Section 7).

Economic Land Concessions (ELCs). We obtain geo-coded data on ELCs from the Open Development Cambodia (ODC) project. These records were made available through the Cambodian League for the Promotion and Defense of Human Rights (LICADHO).[19] The data list all ELCs granted between 1994 and 2010, with information on date, location, and size. We construct an indicator for whether any ELC is present in a commune-year, and we use the log of total ELC area in a commune and year as a complementary measure. During our sample period, ELCs are established in 281 communes (17% of the sample), with an average of 0.51 ELCs per commune. Figure A.4 maps their locations.

[17] The harmonized DMSP series is accessible through https://doi.org/10.6084/m9.figshare.9828827.v2. The blooming correction follows Cao et al. (2019) and removes false light caused by sensor bleed from bright neighboring pixels. The top-coding correction follows Bluhm and Krause (2022) and imputes true brightness for saturated pixels using radiance-calibrated reference data. We use the corrected rasters provided by Chiovelli et al., who apply both corrections to the Li et al. (2020) harmonized series.

[18] We calculate the average corrected luminosity for each commune and year. A commune has nightlights (or is 'lit') if the mean luminosity exceeds 1, as faint transient light below this threshold adds noise without reflecting durable electrification.

[19] The data are available through the ODC website: https://data.opendevelopmentcambodia.net/en/dataset/economiclandconcessions.

Deforestation. To measure resource extraction, we use the normalized difference vegetation index (NDVI), a satellite-based measure of vegetation density. In our setting, a decrease in NDVI primarily reflects deforestation, widely documented as a consequence of land concessions in Cambodia (Diepart, 2015; Wang et al., 2023). Data are from NASA's MODIS satellite sensors.[20] The data are aggregated at the commune level and are available from 2000 to 2010. We focus on minimum NDVI within each commune and year, which captures whether any area has experienced near-complete vegetation loss, the pattern most consistent with large-scale land clearing and resource extraction.

Land disputes. We collect data on land disputes from The NGO Forum on Cambodia.[21] The data include the location, year, type, and reason for each dispute. We aggregate at the commune-year level. The data cover 1992 to 2010, with 270 disputes recorded. Figure A.5 shows their locations across Cambodia.

Household welfare. To assess whether the peace dividend translates into household-level gains, we use data from the Cambodia Socio-Economic Survey (CSES), a nationally representative repeated cross-section covering seven waves between 1997 and 2010. We focus on hours worked in the last seven days and household consumption expenditure, aggregated at the commune level. Our regression samples comprise 2,141 commune-wave observations across 854 communes for hours worked, and 1,783 across 789 communes for consumption. Observations are unweighted commune-wave means of household-level responses.

[20] Available at https://modis.gsfc.nasa.gov/data/dataprod/mod13.php.

[21] See their website: https://www.ngoforum.org.kh/. We thank The NGO Forum on Cambodia for providing us with the disaggregated data.

4.4 Control Variables

We collect a rich set of variables on pre-existing commune characteristics, including latitude, longitude, their interaction, historical US bombing loads, distance to the nearest road, distance to the provincial capital, pre-Khmer Rouge population, and soil fertility. Details, including data sources, are provided in Table A.1.

5 Empirical Strategy

5.1 Identification

Our main question is whether checks and balances on political elites shape post-conflict recovery by determining whether the peace dividend translates into broad-based development or is captured by elites. Testing this hypothesis is challenging. The peace dividend is a latent variable, typically observed only through realized development. Accountability and development may be jointly determined. And unobserved factors could drive both accountability and the returns to post-conflict policies.

We address these challenges by exploiting shocks to the peace dividend that are both observable and plausibly orthogonal to political accountability. The staggered rollout of Cambodia's landmine clearance campaign provides shocks to potential surplus at the commune and year level. We disaggregate the effects of these shocks by the strength of pre-existing local accountability to test if surplus translates into development depending on whether political elites face local checks and balances.

We implement this strategy using the imputation estimator of Borusyak et al. (2024) (hereafter DDI), following Chiovelli et al. (2025). Standard two-way fixed effects estimators can be biased when treatment effects are heterogeneous, because they implicitly use early-

treated units as controls for late-treated units (Goodman-Bacon, 2021). The imputation estimator avoids this by using only not-yet-treated and never-treated observations to construct the counterfactual.

Chiovelli et al. (2025) use this estimator to identify average effects of landmine clearance on economic activity in Mozambique. Our question is different. We ask whether political accountability determines whether the potential surplus from clearance is realized and how it is distributed. This motivates disaggregating the effects of clearance shocks by the strength of pre-existing local accountability:

$$Y_{ct} = \delta_1 \left(C_{ct} \times \mathbb{1}\{A_c = 1\}\right) + \delta_2 \left(C_{ct} \times \mathbb{1}\{A_c = 0\}\right) + X_c'\theta_t + \mu_c + \gamma_p \times \tau_t + \epsilon_{ct}, \quad (1)$$

where Y_{ct} is an outcome in commune c in year t (e.g., economic activity), C_{ct} indicates that commune c has been cleared of landmines by year t, A_c indicates high pre-existing accountability as defined in Section 4, $X_c'\theta_t$ are pre-existing commune characteristics interacted with year fixed effects, μ_c are commune fixed effects, and $\gamma_p \times \tau_t$ are province-by-year fixed effects that absorb province-specific time trends. Standard errors are clustered at the commune level. The coefficients δ_1 and δ_2 capture the effect of clearance in high- and low-accountability communes, respectively. If accountability shapes whether the peace dividend is realized and how it is distributed, we expect clearance to increase economic development where political elites face checks and balances ($\delta_1 > 0$) and to have a null, or smaller effect, where accountability is weak ($\delta_1 - \delta_2 > 0$).

Equation (1) is our main specification throughout the paper. Commune fixed effects absorb all time-invariant differences between high- and low-accountability communes. We therefore do not need to assume that communes with different levels of accountability are comparable in levels. Correlates of accountability, such as level differences in economic potential or geographic characteristics, are accounted for as long as they are time-invariant

within communes. In addition, province-year fixed effects allow for differential trends at the administrative level at which clearance priorities were set. As described in Section 3, clearance timing was determined at the province level based on casualty rates and accessibility, and was not systematically coordinated within provinces. Province-year fixed effects therefore absorb the potentially non-random variation in treatment timing. Our preferred specification also includes a rich set of pre-existing commune characteristics interacted with year fixed effects ($X_c'\theta_t$) as controls: commune coordinates, US bombing loads, distance to the nearest road, distance to the provincial capital, pre-Khmer Rouge population, and soil fertility.

Identification of Equation (1) rests on three assumptions. First, landmine clearance must constitute a shock to local surplus. Second, the timing of clearance in a commune must be orthogonal to pre-existing accountability in that commune, conditional on fixed effects and other controls, so that clearance does not systematically occur earlier or later in communes where political elites face stronger checks and balances. Third, the returns to clearance must be conditionally orthogonal to potential correlates of pre-existing accountability, meaning that high- and low-accountability communes do not experience differential returns to clearance for reasons unrelated to accountability (such as latent economic potential not perfectly captured by our rich set of fixed effects and interacted control variables). The design also requires the standard difference-in-differences conditions that outcomes follow parallel trends and show no anticipation effects, which we test directly.

5.2 Validating Assumptions

We validate each of the identifying assumptions, drawing on qualitative, visual, and empirical evidence.

Assumption (i): Clearance is a shock to local surplus. If landmine clearance constitutes a shock to local potential surplus, we should observe a reduction in casualties upon clearance, with no differential trends before treatment and no anticipation effects. We cannot directly verify an increase in surplus using realized economic outcomes, precisely because our hypothesis is that the translation of potential into realized development depends on accountability. Instead, we rely on victimization as an observable indicator of surplus creation that is upstream of the distribution channel. Fewer casualties mean lower physical risk and greater productive potential of land.

We test this first assumption by examining the average effect of clearance on victimization:

$$Y_{ct} = \delta C_{ct} + X_c'\theta_t + \mu_c + \gamma_p \times \tau_t + \epsilon_{ct}, \tag{2}$$

where Y_{ct} measures victimization in commune c in year t, C_{ct} indicates completed clearance, $X_c'\theta_t$ reflects our baseline controls interacted with year fixed effects, and μ_c and $\gamma_p \times \tau_t$ are commune and province-by-year fixed effects, respectively. Standard errors are clustered at the commune level.

Clearance reduces civilian casualties by 48% on average (Table 1). The number of civilian victims falls by 0.830 per commune-year ($p < 0.01$), a decline of 48% relative to the pre-treatment mean in communes with minefields (Column 4). The probability of any civilian casualty falls by 8.3 percentage points ($p < 0.01$), or 27% of the pre-treatment mean (Column 2), and the log number of civilian victims declines by 0.151 ($p < 0.01$, Column 6). These effects are robust to the inclusion of our rich set of interacted controls. The majority of landmine victims are farmers and schoolchildren (Figure A.3), suggesting that clearance expands agricultural capacity and human capital accumulation by greatly reducing the risk of land use.

Two further tests confirm that the drop in victimization reflects clearance rather than

confounding dynamics. Anticipation placebos, shifting treatment six years before actual clearance, rule out anticipation effects (Figure 3). Pre-trends split by accountability are flat in both high- and low-accountability communes (Figure A.6).

Clearance timing is also unrelated to pre-existing economic conditions. 1992 economic outcomes do not predict when a commune was cleared (Figure 4), supporting the assumption that clearance timing is not driven by economic or political factors.

Assumption (ii): Clearance is orthogonal to pre-existing accountability. We provide three pieces of evidence that the timing of clearance in a given commune does not depend on local accountability. First, clearance was planned top-down by international organizations on the basis of casualty rates and contamination density at the provincial level, with no criteria related to local political conditions, while letters of possession emerged bottom-up from communities' historical experiences under the Khmer Rouge. These two sources of variation were determined at different administrative levels by different actors.

Second, Figure A.2 maps the locations of minefields alongside communes with high accountability. The spatial distributions show no systematic correlation.

Third, Table 2 regresses minefield characteristics and clearance timing on local accountability. The estimates confirm no significant association between the presence, density, or timing of clearance of minefields and the prevalence of letters of possession.[22]

Assumption (iii): Potential returns to clearance are orthogonal to potential correlates of pre-existing accountability. The remaining concern is that accountability may theoretically correlate with other commune characteristics, such as population density or latent

[22] Note that while the *location* of minefields near strategically important areas is non-random, our identification exploits only the *timing* of clearance. Time-invariant differences in minefield placement are absorbed by commune fixed effects, and differential trends associated with commune characteristics are addressed by our controls ($X_c'\theta_t$).

economic potential due to geographic features, that could independently shape the returns to clearance. If denser or more accessible communes both have higher accountability and benefit more from clearance for reasons unrelated to accountability, our estimates would be biased. Commune fixed effects absorb time-invariant differences between high- and low-accountability communes, but differential time trends correlated with accountability could still bias our estimates.

We address this concern in three ways. First, we test whether clearance generates potential surplus in both high- and low-accountability communes. Our conceptual framework predicts that accountability shapes the distribution of surplus, not its creation, so clearance should reduce victimization regardless of local checks and balances. Table A.6 confirms this. Clearance reduces the number of civilian victims in both high- and low-accountability communes (Column 4, $\hat{\delta}_1 = -0.319$, $p < 0.05$; $\hat{\delta}_2 = -0.878$, $p < 0.01$).[23] Among ever-treated communes, where identification relies solely on variation in clearance timing, the reductions are significant on all three margins in both groups (Table A.12), ruling out that surplus creation itself differs by accountability.

Pre-trends in victimization are also flat in high- and low-accountability communes separately (Figure A.6), ruling out that accountability-specific trends in victimization could confound the surplus creation results. We examine pre-trends for the main outcomes in Section 6.2.

Second, we verify our results using the alternative accountability proxy based on Khmer Rouge productivity shocks described in Section 4. If our results were driven by letters of possession proxying for economic potential rather than accountability, or if clearance itself caused communities to obtain more letters, the results should not replicate with this alternative

[23] Point estimates on the extensive margin and log outcomes are negative in both groups but reach conventional significance only in low-accountability communes (Columns 2 and 6), likely reflecting lower statistical power in the smaller high-accountability subsample.

measure, which is clearly pre-determined.[24] We present this test after our main results.

Third, we show in robustness tests that clearance has no significantly differential effects on our main outcomes when we replace accountability with placebo splits on pre-existing commune characteristics that could be correlated with accountability, such as population, road access, or soil fertility. These results appear in Section 6.2.

6 Results

Having established that clearance generates potential surplus regardless of accountability, we now turn to the central question: does accountability determine whether this surplus is realized and by whom?

6.1 Development

Landmine clearance significantly increases economic activity in high-accountability communes, with substantially smaller effects where accountability is weak (Table 3). In our preferred specification with controls (Column 2), clearance raises the probability that a commune has any nightlights by 7.3 percentage points ($\hat{\delta}_1 = 0.073$, $p < 0.01$). The effect on log nightlights is similarly large and significant ($\hat{\delta}_1 = 0.394$, $p < 0.01$, Column 4), as is the winsorized variant that reduces low luminosity reading noise ($\hat{\delta}_1 = 0.481$, $p < 0.01$, Column 6). The corresponding estimates for low-accountability communes are much smaller. The effect on the probability of any nightlights is not statistically significant ($\hat{\delta}_2 = 0.015$, Column 2), and the log-outcome estimates, while positive, are less than half the magnitude of the high-accountability effects. The difference between high- and low-accountability communes

[24] In principle, one could instrument the letters-of-possession measure with the KR productivity shocks. We use this as an alternative proxy instead of instrumenting, because statistical power is insufficient for a two-stage approach.

is statistically significant ($p = 0.001$ for any nightlights; $p = 0.016$ for winsorized log nightlights). For comparison, Chiovelli et al. (2025) estimate that clearance in Mozambique raises the probability of any luminosity by 5.0 to 5.6 percentage points from a similarly low base.

These results support a key prediction of the conceptual framework. When political elites face checks and balances, the potential surplus created by clearance translates into broad-based economic development. When accountability is weak, a similar surplus yields substantially smaller improvements in local economic activity. Differential surplus creation cannot explain this divergence. If anything, clearance reduces victimization by more in low-accountability communes (Table A.6), ruling out that less surplus was generated where development failed to materialize.[25]

This finding replicates when we replace letters of possession with the alternative accountability proxy based on transient Khmer Rouge productivity shocks (Table A.7). Because this variation is driven by historical weather shocks unrelated to contemporary economic conditions (Bühler and Madestam, 2026), this replication addresses heterogeneous returns to land quality as a potential driver of our results. We report these results in detail in Appendix C. Further robustness checks are reported at the end of this section, followed by evidence on underlying mechanisms.

6.2 Robustness

We subject our main findings to additional robustness checks, addressing remaining concerns about pre-trends, the definition of accountability, potential confounders, and specification choices.

[25] The average effect of clearance on nightlights across all communes is positive but modest ($\hat{\delta} = 0.020$, $p < 0.05$; Table A.5). This small average decomposes into a strong positive effect in high-accountability communes and a much smaller effect in the majority of communes where accountability is weak, consistent with Cambodia's overall weak institutional environment. Pre-trends and anticipation placebos at the pooled level (Figure A.7) confirm the absence of differential trends or anticipation in the average effect.

Pre-trends by accountability. Our identification strategy requires that high- and low-accountability communes do not follow differential trends in outcomes prior to clearance. We test this by estimating pre-treatment coefficients separately for each subgroup, reporting the joint test of whether all pre-treatment coefficients are zero (Roth et al., 2023). The pre-treatment coefficients are jointly insignificant at conventional levels across victimization (Figure A.6) and nightlights (Figure 5).[26]

Correlates of accountability. Accountability could correlate with commune characteristics whose time trends independently shape the returns to clearance. To address this, we perform placebo heterogeneity tests, replacing the accountability indicator in equation (1) with median splits on pre-existing commune characteristics (population, distance to the nearest road, distance to the provincial capital, US bomb load, and soil fertility). None of these placebo splits produce a statistically significant difference in the effect of clearance on nightlights at the 5% or 10% level (Figure A.8), confirming that the heterogeneity we document is specific to accountability rather than a generic feature of commune characteristics. Reassuringly, the accountability split is more than twice the largest placebo difference and the only one significant at conventional levels.

Alternative accountability cutoffs. The main result is qualitatively robust across a range of accountability cutoffs. We define high-accountability communes as those where at least 10%, 25%, 33%, or 50% of farmers hold pre-2002 letters of possession. The effect of clearance on nightlights is positive and significant in high-accountability communes at every cutoff, and it grows as we require a larger share of farmers to hold letters, while the effect in low-accountability communes remains small throughout (Figure A.9). This monotone pattern, with stronger development gains where letters of possession cover a larger share of

[26] The corresponding pooled-sample test for nightlights is reported in Figure A.7.

farmers, is exactly what we would expect if letters capture accountability rather than unrelated commune characteristics. The results also hold under a continuous measure of accountability, though the log-outcome coefficients are less precisely estimated (Table A.8).

Accountability based on landholdings. Our main measure weights every farmer equally, regardless of land holding size. Land holding inequality can interact with local political dynamics, so the share of farmers and the share of land covered by letters need not move together. We therefore replace the main measure with the share of agricultural landholdings covered by letters of possession. The results on nightlights replicate, though differences between high- and low-accountability communes are less precisely estimated for the log specifications (Table A.9).

Market access. Trade linkages could in theory drive the results. Chiovelli et al. (2025) document that clearance in Mozambique improved development partly through this channel. We address this in two ways. First, we control for standardized market access, constructed following Chiovelli et al. (2025) as detailed in Appendix B. Clearance does not have large effects on market access in our setting (Table A.10), and the main results are unchanged when controlling for it (Table A.11, Column 1). Second, we aggregate outcomes to the district level to account for potential spillovers, including local market access effects (Column 2). The results again hold, implying that market access plays a limited role in our context.

Specification checks. We also test three alternative specifications. First, we replace province-by-year with district-by-year fixed effects to allow for more granular differential trends. Second, we include accountability-by-year fixed effects to absorb time-varying shocks common to communes with similar accountability levels. Third, we drop communes in the top 10% of clearance duration.

Across all specifications, the high-accountability effect remains positive and statistically significant at the 5% level or better ($\hat{\delta}_1$ ranges from 0.032 to 0.078), while the low-accountability effect remains small and at most marginally significant (Table A.11). The formal difference between the two groups is significant at the 10% level or better in four of the five specifications, losing precision only under accountability-by-year fixed effects ($p = 0.160$, Column 4), the most demanding check.

Sample robustness. Our main specification compares cleared communes to both not-yet-cleared minefield communes and never-contaminated communes. If the latter comparison drives the results, identification would rest on cross-sectional variation rather than on clearance timing. To isolate the timing variation, we restrict the sample to ever-treated communes. The results are robust to this restriction and if anything sharper. The divergence between high- and low-accountability communes is highly significant for nightlights (Table A.13).

7 Mechanisms

What explains the divergence between high- and low-accountability communes? We document one mechanism: elite capture through Economic Land Concessions (ELCs). If accountability constrains capture, the surplus from clearance can reach households. If it does not, cleared land is vulnerable to extraction and displacement. We test each link in this chain using data on ELCs, forest cover, land disputes, and household economic outcomes from the Cambodia Socio-Economic Survey (CSES).

7.1 Elite Capture and Resource Extraction

The institutional setting generates a direct prediction. Cambodian land law allows for the reclassification of land not in continuous use as state property and establishes the legal framework for ELCs. Because landmines prevented cultivation, clearance removes the physical barrier to accessing land already classifiable as "unused" and increases its value, activating attempts to transfer it to politically connected concessionaires. However, in communes where demand for political accountability is strong, the political cost of reclassifying occupied land as state property is higher. We therefore expect landmine clearance to be associated with ELCs where accountability is weak but not where it is strong.

Clearance increases ELCs where accountability is weak (Table 4). In low-accountability communes, clearance raises the probability of any ELC by 7.0 percentage points ($\hat{\delta}_2 = 0.070$, $p < 0.01$, Column 2). Relative to the pre-treatment mean of 0.044, this is a large effect. The point estimate in high-accountability communes is small and statistically insignificant ($\hat{\delta}_1 = 0.018$, Column 2). The same pattern holds for log ELC area ($\hat{\delta}_2 = 0.615$, $p < 0.01$, Column 4), with no significant effect where accountability is strong. The formal difference between the two groups is significant at the 10% level for the log specification ($p = 0.074$, Column 4). The evidence indicates that accountability attenuates capture.

If ELCs in low-accountability communes are extractive rather than productive, we should observe resource depletion in the same communes where concessions expand. Columns 5–6 of Table 4 test this. Indeed, clearance significantly reduces forest cover in low-accountability communes ($\hat{\delta}_2 = -0.011$, $p < 0.05$, Column 6), while forest cover is unaffected in high-accountability communes ($\hat{\delta}_1 = 0.014$, insignificant). The difference is statistically significant ($p = 0.020$). The combination of ELC expansion, forest loss, and limited gains in nightlights suggests that concessions primarily extract resources rather than develop them. The household-level evidence in the next subsection confirms that these concessions do not

generate local welfare gains.

Clearance is also associated with land disputes only in low-accountability communes (Table 5). In the preferred specification, clearance raises the probability of any ongoing land dispute by 2.2 percentage points in low-accountability communes ($\hat{\delta}_2 = 0.022$, $p < 0.05$, Column 2), while the point estimate in high-accountability communes is near zero ($\hat{\delta}_1 = -0.003$, Column 2). The difference between high- and low-accountability communes reaches 10% significance for the number of disputes ($p = 0.078$, Column 4). Because ELCs are the leading reason for land disputes (Figure A.10), this pattern links concessions directly to local conflict over resources.

7.2 Household Welfare

The final link in the chain concerns households. If cleared land is captured through ELCs, local households lose access to productive land, reducing their labor input. If accountability prevents capture, households can use newly cleared land, raising productivity and consumption.

Clearance reduces household labor in low-accountability communes (Table 6). Hours worked fall by 2.8 per week ($\hat{\delta}_2 = -2.790$, significant at the 10% level, Column 2), a decline of about 6% relative to the pre-treatment mean of 43.8 hours. The log specification is significant at the 5% level ($\hat{\delta}_2 = -0.079$, Column 4). The point estimate in high-accountability communes is near zero ($\hat{\delta}_1 = -0.715$, Column 2), though the formal difference between the two groups is not statistically significant at conventional levels ($p = 0.388$ for hours, Column 2; $p = 0.494$ for log hours, Column 4). The decline in hours is consistent with displacement from captured land. ELCs frequently extend beyond their contractual boundaries into adjacent smallholdings (Diepart, 2015), displacing existing agricultural labor. An alternative interpretation is that ELC operations employ fewer workers than the smallholder farming

they replace. The data cannot distinguish between these channels, but both are consistent with a reduction of economic opportunities for local households.

Consumption follows the same pattern. In high-accountability communes, clearance raises household consumption by 22% ($\hat{\delta}_1 = 0.201$, $p < 0.05$, Column 6). In low-accountability communes, the effect on consumption is small and insignificant ($\hat{\delta}_2 = -0.002$, Column 6). The difference between high- and low-accountability communes is significant at the 10% level ($p = 0.054$). Where accountability constrains elite behavior, households benefit directly from the surplus created by clearance. Where it does not, the same surplus generates no welfare gains for the local population. Anti (2021) provides independent evidence that large-scale land acquisitions in Cambodia reduce household spending in affected areas.

Taken together, the mechanism evidence traces a consistent chain from clearance to outcomes. In low-accountability communes, elites claim cleared land through ELCs that extract resources via deforestation, generate land disputes, and displace households. In high-accountability communes, none of these intermediate effects appear, and households consume more. The pattern is consistent across all mechanism outcomes, reinforcing the interpretation that accountability determines whether the peace dividend reaches households or is captured by political elites.

8 Conclusion

Political accountability determines whether post-conflict economies recover or stagnate. In Cambodia, we show this by exploiting the staggered timing of landmine clearance interacted with pre-existing checks and balances on political elites.

We find that clearance generates a peace dividend everywhere. Civilian casualties fall in

both high- and low-accountability communes, consistent with an expansion of agricultural potential and human capital. But the translation of this potential surplus into realized development depends on accountability. In communes where political elites face checks and balances that constrain capture, clearance raises nightlights and household consumption. In communes where accountability is weak, elites capture the same surplus through land concessions and deforestation, with an increase in land disputes and far smaller economic gains for the local population.

Post-conflict recovery is not guaranteed by the removal of physical barriers to production. Standard convergence models predict that restoring access to productive land should generate growth. Our results suggest that this prediction holds only where institutions constrain elite behavior. Without accountability, the peace dividend may be diverted and result in economic stagnation and renewed conflict.

Development policies broadly viewed as beneficial can enable elite capture. Landmine clearance made previously inaccessible land valuable and available, but this very availability created opportunities for expropriation. Post-conflict reconstruction programs that ignore the political economy of resource allocation risk enabling elite capture rather than recovery.

These findings are directly relevant to contemporary reconstruction efforts, most notably in Ukraine, now the most heavily mined country and one of the most corrupt countries in the world (Landmine and Cluster Munition Monitor, 2024; Transparency International, 2024). Our evidence warns that successful landmine clearance alone will not guarantee inclusive recovery where conditions for elite capture are present.[27] Coupling reconstruction with institutional reforms that strengthen political accountability will be essential for the peace dividend to reach the population once the conflict ends.

[27] See *The Economist*, https://www.economist.com/europe/2025/11/17/a-huge-corruption-scandal-threatens-ukraines-government.

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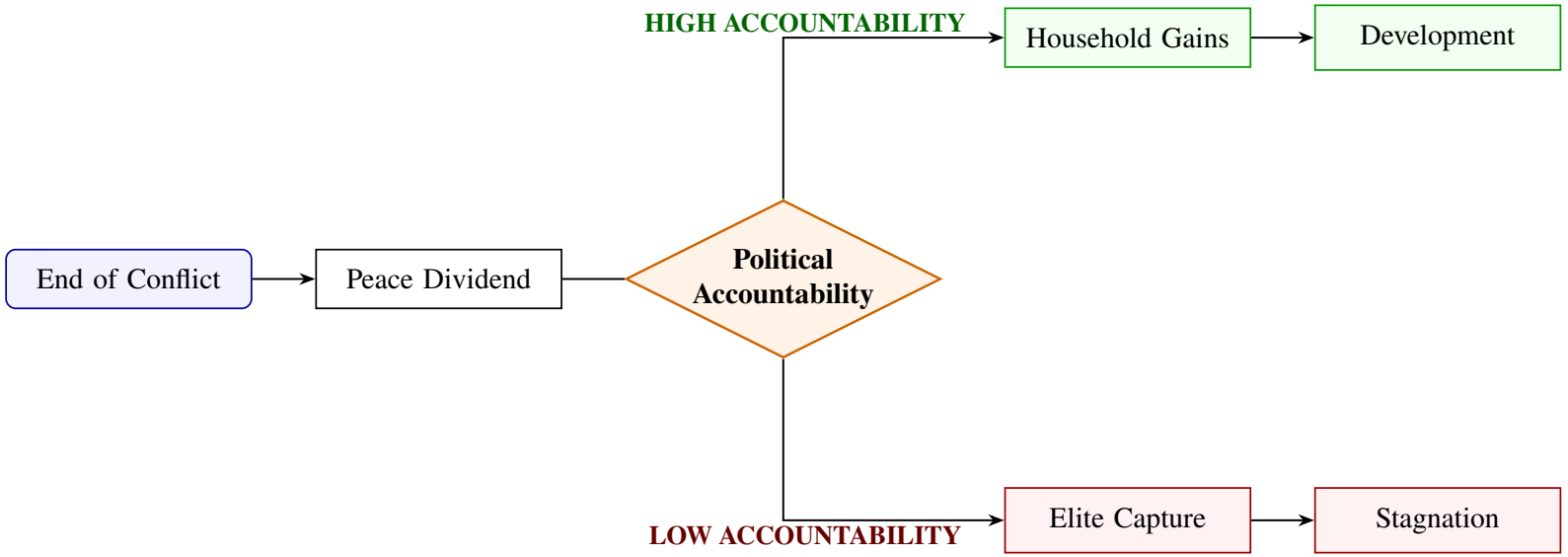
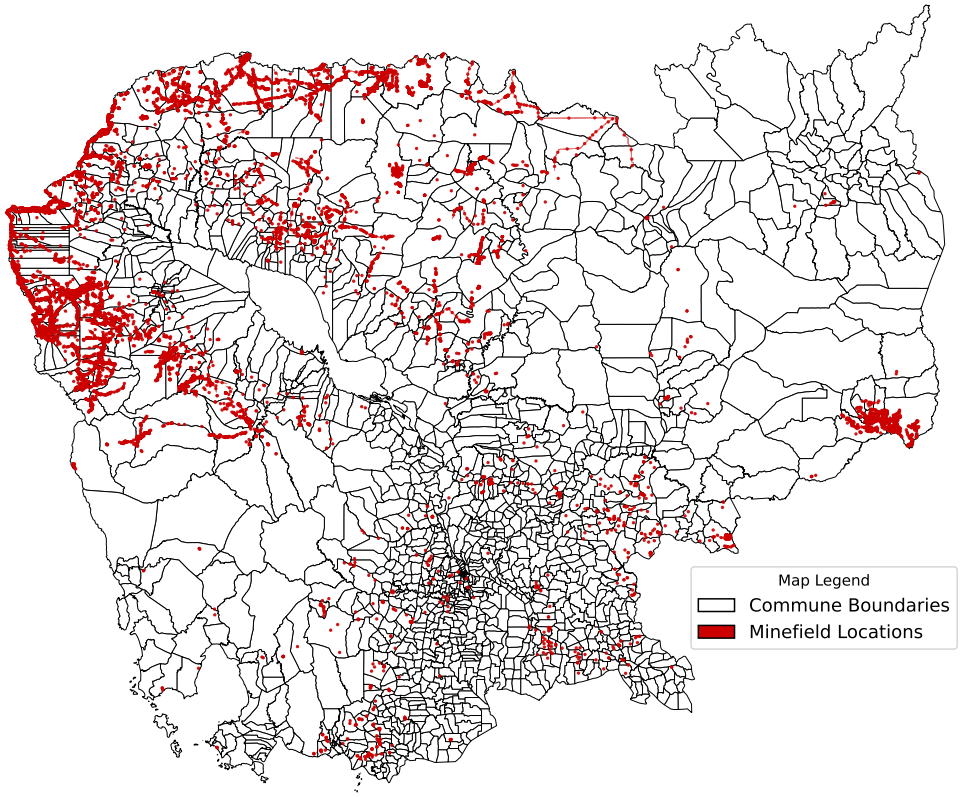
Figures

Figure 1: Conceptual Framework



Notes: This figure summarizes the conceptual framework outlined in Section 2. Landmine clearance after the end of conflict generates a latent peace dividend. In high-accountability areas, where political elites face checks and balances, the surplus translates into realized economic development. In low-accountability areas, elites capture the surplus, resulting in stagnation and potentially renewed conflict.

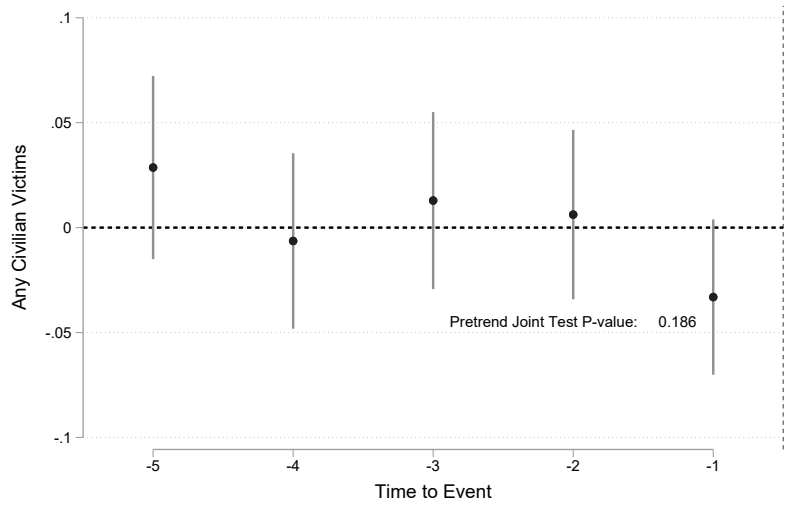
Figure 2: Map – Cleared Minefields in Cambodia (2010)



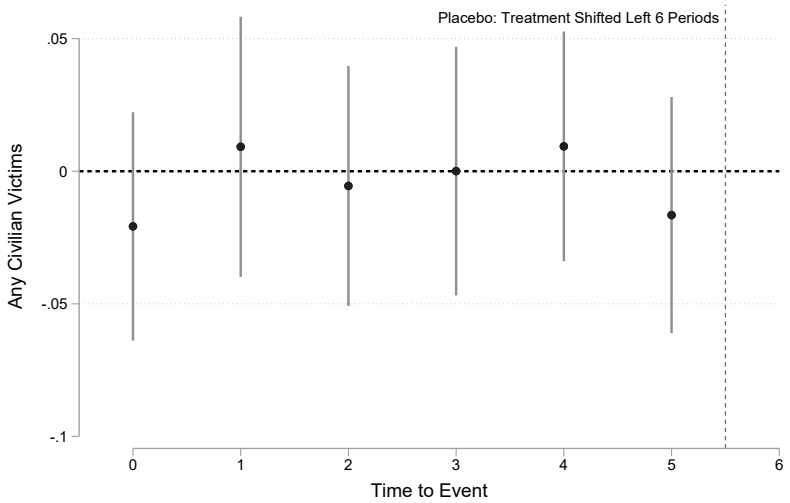
Notes: The map shows the locations of cleared minefields (in red) in our sample, including all clearances completed by 2010. Data on clearance locations are from organizations coordinating mine clearance efforts in Cambodia (CMAC and The Halo Trust). The black lines indicate commune borders based on 2014 administrative boundaries. Data on earlier boundaries are unavailable in Cambodia.

Figure 3: Victimization: Pre-trends and Anticipation Placebos

(a) Pre-trends

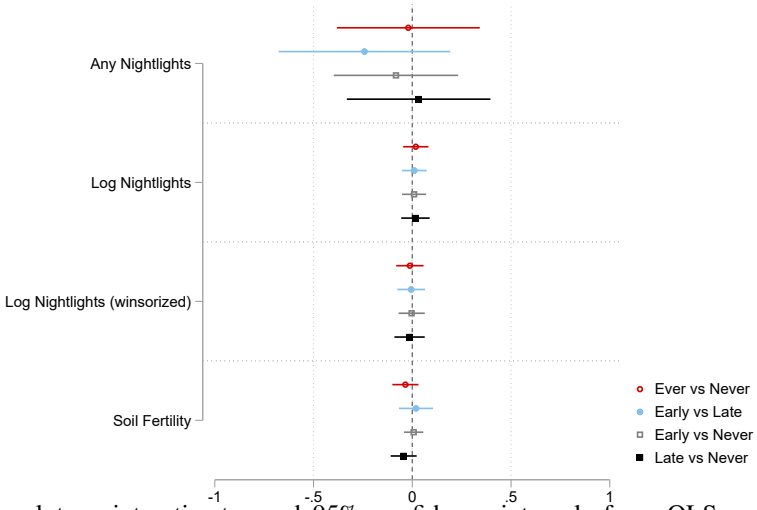


(b) Anticipation Placebos



Notes: The outcome variable is an indicator for any civilian victims in a commune and year. Victimization regressions are restricted to 1997–2010, the period over which our civilian classification is consistently available. In Panel (a), we report the pre-trend coefficients for the effects of mine clearance based on an event study generalization of Equation 2, following the DDI approach from Borusyak et al. (2024). In Panel (b), we report coefficients from an anticipation placebo that shifts the treatment to six years before any mine clearance in the commune, based on Equation 2, following Borusyak et al. (2024). We include commune and province-year fixed effects as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Confidence intervals spanning zero indicate no significant association at the 5% level. Panel (a) reports the p-value from a joint test of the null that all pre-treatment coefficients are zero.

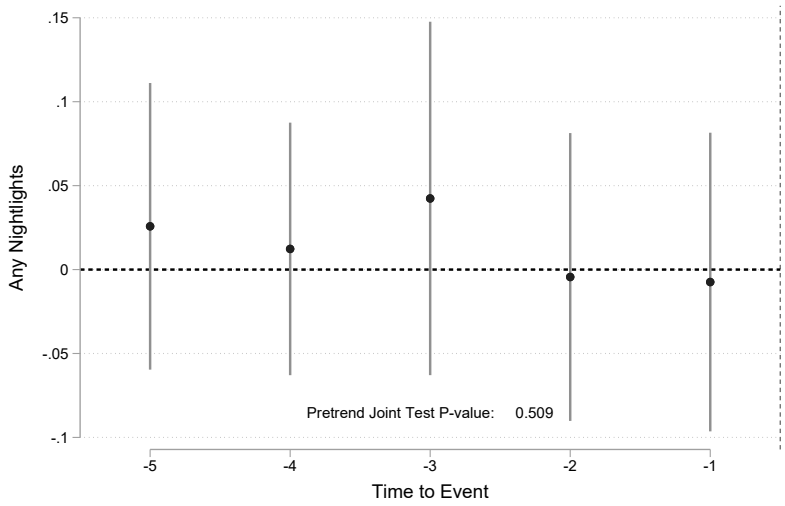
Figure 4: Balance Test – 1992 Economic Outcomes and Landmine Clearances



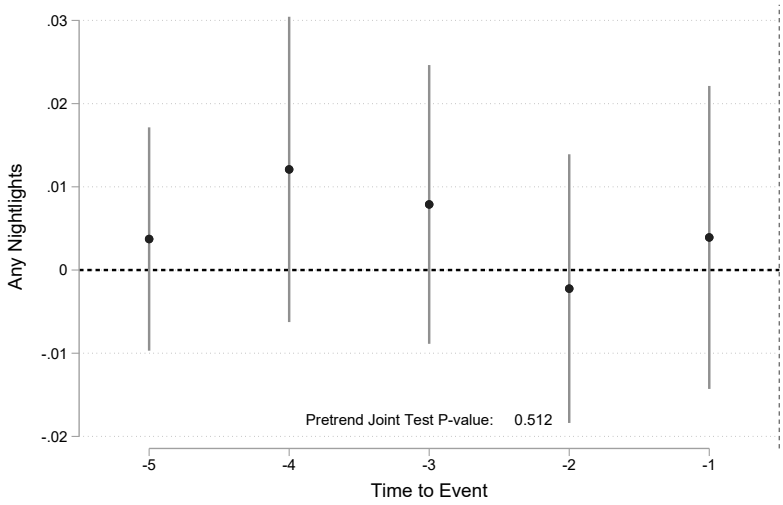
Notes: This figure plots point estimates and 95% confidence intervals from OLS regressions where the dependent variables are indicators for communes belonging to specific treatment timing groups (ever cleared, never cleared, early cleared, or late cleared) and the independent variables are economic measures from 1992 (pre-clearance). Confidence intervals spanning zero indicate no significant association at the 5% level.

Figure 5: Any Nightlights: Pre-trends by Accountability

(a) Pre-trends in High Accountability Communes



(b) Pre-trends in Low Accountability Communes



Notes: The outcome variable is an indicator for whether any nightlights are visible in a commune and year. In Panel (a), we report the pre-trend coefficients for the effects of mine clearance among high accountability communes based on an event study generalization of Equation 2, following the DDI approach from Borusyak et al. (2024). In Panel (b), we report the pre-trend coefficients for the effects of mine clearance among low accountability communes based on an event study generalization of Equation 2, following the DDI approach from Borusyak et al. (2024). We include commune and province-year fixed effects as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Confidence intervals spanning zero indicate no significant association at the 5% level. Each panel reports the p-value from a joint test of the null that all pre-treatment coefficients are zero.

Tables

Table 1: Average Effects of Clearance – Victimization

	Any Civilian Victims		Civilian Victims		log Civilian Victims	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared	-0.090***	-0.083***	-0.886***	-0.830***	-0.165***	-0.151***
	(0.022)	(0.022)	(0.172)	(0.167)	(0.032)	(0.030)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	19,188	19,188	19,188	19,188	19,188	19,188
Clusters	1,464	1,464	1,464	1,464	1,464	1,464
Dep. Var. Pre-Treatment Mean	0.305	0.305	1.722	1.722	0.463	0.463

Notes: This table reports the δ estimates from Equation 2 for the effect of completed minefield clearances on victimization. The outcomes are an indicator for any civilian victim within a commune and year, the number of civilian victims, and the log civilian victims, defined as log(Number of Civilian Victims + 1). Victimization regressions are restricted to 1997–2010, the period over which our civilian classification is consistently available. We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. All specifications are estimated using the DDI approach by Borusyak et al. (2024). Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Orthogonality of Landmine Clearance and Accountability

	Presence		Characteristics		Timing of Demining		
	Minefield	# Mines	log Mine Area	log Mine Perimeter	Start Year	End Year	Duration (Years)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High Accountability	-0.016	-1.541	-0.266	-0.201	-0.684	-0.678	-0.066
	(0.036)	(1.299)	(0.331)	(0.240)	(0.840)	(0.794)	(0.779)
Province Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Commune-Level Controls	✓	✓	✓	✓	✓	✓	✓
Number of Communes	1,621	1,621	551	551	551	551	546
Outcome Mean	0.340	11.012	11.448	8.270	2001.544	2006.152	4.645

Notes: This table presents cross-sectional regressions of demining activities and minefield characteristics on our measure of political accountability, which is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. An observation is a commune, and we organize the outcomes into three categories: the presence of minefields, characteristics of minefields, and the timing of demining. In Columns (1)-(2), we use all communes and look at an indicator for any minefields in a commune and the number of mines. In Columns (3)-(4), the sample is restricted to communes with minefields, as we regress the size of minefields in a commune on accountability in that commune. In Columns (5)-(7), we again restrict to communes with minefields and assess whether the start year of clearance, the end year of clearance, or the duration of clearance in a commune varies with accountability in that commune. Standard errors are robust to heteroskedasticity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Economic Development and Accountability

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.078***	0.073***	0.472***	0.394***	0.542***	0.481***
	(0.017)	(0.016)	(0.117)	(0.091)	(0.118)	(0.094)
Cleared × Low Accountability	0.022**	0.015	0.229**	0.172*	0.225**	0.174*
	(0.010)	(0.009)	(0.102)	(0.093)	(0.107)	(0.096)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	28,148	28,148	28,148	28,148	28,148	28,148
Clusters	1,613	1,613	1,613	1,613	1,613	1,613
Dep. Var. Pre-Treatment Mean	0.029	0.029	-8.565	-8.565	-8.688	-8.688
Difference High and Low Acc	0.055	0.058	0.243	0.222	0.317	0.307
P-value on difference	0.004	0.001	0.103	0.069	0.038	0.016

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on local economic development measured by satellite-based nightlights (NTL) as a function of local accountability. Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights, defined as log(Nightlights + 0.0001), and the log of winsorized nightlights, which removes very small luminosity values to reduce low-end measurement noise before applying the same transformation. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Elite Capture and Accountability

	ELCs		log ELC Area		Forest Cover	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.014	0.018	0.042	0.088	0.015	0.014
	(0.028)	(0.030)	(0.229)	(0.250)	(0.010)	(0.010)
Cleared × Low Accountability	0.070***	0.070***	0.625***	0.615***	-0.009**	-0.011**
	(0.018)	(0.017)	(0.169)	(0.165)	(0.004)	(0.005)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	28,167	28,167	28,167	28,167	14,523	14,523
Clusters	1,614	1,614	1,614	1,614	1,377	1,377
Dep. Var. Pre-Treatment Mean	0.044	0.044	0.467	0.467	0.015	0.015
Difference High and Low Acc	-0.057	-0.052	-0.583	-0.527	0.025	0.025
P-value on difference	0.088	0.132	0.038	0.074	0.019	0.020

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on outcomes related to elite capture as a function of local accountability. Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. ELCs stands for Economic Land Concessions and is an indicator equal to 1 if an ELC exists in a commune and year and 0 otherwise. Log ELC Area is defined as log(ELC Area + 1). Forest Cover is determined by the minimum NDVI in a commune and year, our satellite-based measure of vegetation and forest cover. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Land Disputes and Accountability

	Any Dispute		Disputes		log Disputes	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	-0.002	-0.003	-0.008	-0.008	-0.003	-0.004
	(0.018)	(0.018)	(0.016)	(0.016)	(0.012)	(0.012)
Cleared × Low Accountability	0.021**	0.022**	0.024**	0.024**	0.016**	0.016**
	(0.009)	(0.009)	(0.009)	(0.010)	(0.006)	(0.006)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	28,167	28,167	28,167	28,167	28,167	28,167
Clusters	1,614	1,614	1,614	1,614	1,614	1,614
Dep. Var. Pre-Treatment Mean	0.018	0.018	0.018	0.018	0.012	0.012
Difference High and Low Acc	-0.023	-0.025	-0.031	-0.032	-0.019	-0.020
P-value on difference	0.220	0.203	0.082	0.078	0.131	0.122

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on land disputes as a function of local accountability. Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. Any Disputes is an indicator for having any ongoing dispute in the commune. Disputes captures the cumulative number of ongoing land disputes in a commune and year. Log Disputes is defined as $\log(\text{Disputes} + 1)$. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Household Welfare and Accountability

	Hours Worked		log Hours Worked		log Consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.051	-0.715	-0.018	-0.039	0.149***	0.201**
	(1.925)	(2.025)	(0.044)	(0.047)	(0.056)	(0.083)
Cleared × Low Accountability	-2.899**	-2.790*	-0.077**	-0.079**	-0.003	-0.002
	(1.409)	(1.466)	(0.036)	(0.038)	(0.065)	(0.068)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	2,141	2,141	2,141	2,141	1,783	1,783
Clusters	854	854	854	854	789	789
Dep. Var. Pre-Treatment Mean	43.776	43.776	3.743	3.743	11.692	11.692
Difference High and Low Acc	2.950	2.075	0.059	0.040	0.153	0.203
P-value on difference	0.196	0.388	0.282	0.494	0.068	0.054

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of landmine clearance on outcomes from the Cambodian Socio-Economic Survey (CSES) household-level data aggregated at the commune level as a function of local accountability. Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. Hours worked is the total hours worked in the past seven days, averaged at the commune level. Log hours worked is the log transformation of this variable. Log consumption is the log of household consumption expenditure, averaged at the commune level, defined as log(Consumption + 1). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. All specifications are estimated using the DDI approach by Borusyak et al. (2024). Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

A Additional Background

This appendix provides additional details on the three institutional elements described in Section 3: landmine clearance, letters of possession, and economic land concessions.

A.1 Landmine Clearance

Several international humanitarian organizations supported or contributed to the first clearance operations alongside UNTAC, including Handicap International (HI), Norwegian People's Aid (NPA), World Vision, CARE, and the Coalition for Peace and Reconciliation. In 2000, the Cambodian Mine Action and Victim Assistance Authority (CMAA) was established by royal decree to coordinate mine clearance activity nationwide.[28]

The evolution of clearance prioritization can be divided into two phases. In the early post-conflict years, demining was an ad-hoc, emergency humanitarian response led by international NGOs. Prioritization was driven primarily by casualty data and the technical accessibility of contaminated sites. Operators used historical casualty maps to identify hotspots where the threat to life was most acute. Economic potential was not a criterion. Because these organizations operated largely independently of the Cambodian state and were funded directly by external donors, clearance operations were unrelated to local commune-level political conditions (Maxwell, 2001).

The establishment of the CMAA in 2000 introduced a more structured planning process. *Sub-Decree No. 70 (2004)* transferred the mandate for prioritization from international operators to Provincial Mine Action Committees (PMACs) and technical Mine Action Planning Units (MAPUs) (Royal Government of Cambodia, 2004). MAPU technical teams verify and inspect sites, and PMACs, chaired by the Provincial Governor, produce the final an-

[28] See the CMAA website for more detail: https://www.cmaa.gov.kh/background.

nual work plan. Decision-making power remained concentrated at the provincial level, with prioritization continuing to be guided primarily by casualty data (Mine Action Review, 2016).

A.2 Letters of Possession

As described in Section 3.2, letters of possession reflect a bottom-up demand for political accountability that raises the cost of elite capture. Letters are not formal property rights: they are not registered cadastral titles and carry no collateral value. Where formal property rights eventually emerged, they did so as a downstream consequence of the political engagement that letters reflect.

Letters required political engagement. Letters of possession were issued through a process centered on the commune chief (*me khum*), whose certifying role dates to the French protectorate era (Diepart, 2015). Under Cambodia's sporadic land registration system, the commune chief verified the applicant's identity and occupancy, endorsed the claim, and forwarded it to the district cadastral office (Hem, 2019). Because the formal registration system was slow and riddled with petty corruption that excluded ordinary peasants (Diepart, 2015), most rural households never advanced beyond the commune-level letter. The prevalence of letters thus reflects the degree to which residents engaged with and demanded accountability from local political leaders.

Letters reflect demand for political accountability. Bühler and Madestam (2026) show that the same historical variation in genocide intensity that predicts letters of possession also predicts opposition voting, stronger democratic attitudes, greater political knowledge, and higher voter turnout. These outcomes extend well beyond land documentation, indicating that letters capture a broader demand for checks on authority in communes where trust in

institutions had been most thoroughly destroyed. If letters merely recorded property claims, their distribution should instead correlate with land values or agricultural potential. In our sample, letter prevalence is not systematically associated with pre-existing commune characteristics that proxy for land value or agricultural potential.

The Boeung Kak Lake case. The Boeung Kak Lake eviction illustrates how documented possession claims activated external political sanctions. In 2007, the Cambodian government granted Shukaku Inc., a company controlled by a senator from the ruling Cambodian People's Party with close ties to Prime Minister Hun Sen, a 99-year lease over 133 hectares of central Phnom Penh for $79 million (Un and So, 2011). More than 4,000 families living in the area held letters of possession and other occupancy documents. Beginning in 2008, the developer pumped sand into the lake to create buildable land, flooding homes and forcing residents out. Families who refused to leave were reclassified as illegal squatters, and many were offered compensation packages far below market value.

The evictions coincided with the World Bank-funded Land Management and Administration Project (LMAP) operating in the area. In 2009, the World Bank's Inspection Panel found that the project had "denied access to due process" and caused "grave harm" to affected residents whose documented land claims were overridden without formal adjudication.[29] In August 2011, the World Bank suspended all new lending to Cambodia. Annette Dixon, the Bank's country director, stated that "it has become clear that residents in the Boeung Kak area are not being fairly treated."[30] The freeze remained in place until 2012, when the government issued titles to approximately 800 families on 12.44 hectares of the site.

This case demonstrates how documentation activates political pressure, as described in

[29] World Bank, "World Bank Board of Executive Directors Considers Inspection Panel Report on Cambodia Land Management and Administration Project," Press Release, March 8, 2011. Last accessed April 7, 2026.

[30] See "World Bank suspends new lending to Cambodia over evictions," *The Guardian*, August 10, 2011. Last accessed April 7, 2026.

Section 3.4. Where documented possession claims existed, local residents were politically engaged, and international monitors could verify violations and impose political costs on the government. The paper trail that letters created was legible not only to local communities but to the World Bank, donor governments, and international civil society organizations. Where no such documentation existed, expropriation proceeded without generating political friction.

A.3 Economic Land Concessions

Land concessions began to appear in the 1990s, primarily for forestry and economic use (Diepart and Schoenberger, 2016; Diepart, 2015). The 2001 Land Law formalized further reforms to land rights and distribution. This law established the legal framework for ELCs, granting companies development rights over areas up to 10,000 hectares. Officially, the purpose of these concessions was to stimulate agricultural and industrial activity in rural regions, generate employment, and develop idle land (Diepart and Schoenberger, 2016). However, widespread allegations of land grabbing have cast doubt on these justifications. Local communities have frequently contested official claims that only degraded land was appropriated (Diepart and Schoenberger, 2016; Neef et al., 2013).

Two features of Cambodian land law enabled appropriation. First, Cambodia's official land titling system, established in 1989,[31] required a multi-step process involving village, commune, and district officials, along with a site survey. This complexity created bottlenecks and opened the door to petty corruption. As a result, many low-income farming families were discouraged from participating (Diepart, 2015).[32] Following the 2001 reforms, the World

[31] This formal system is distinct from the informal letters of possession described in Section 3.2: hard titles carry legal ownership rights and collateral value, whereas letters of possession merely document occupancy and reflect a demand for accountability rather than a state-sanctioned property right.

[32] Evidence from the 1990s suggests that only around 10% of applications were successfully processed (Van Acker, 1999).

Bank supported a project to improve land titling and property rights, but progress was slow. Critics argued that the reform disproportionately benefited wealthy investors, sidelining the needs of rural communities (Milne, 2013). Thus, while the 2001 Land Law clarified rights for large-scale land concessions, it did little to secure property rights for Cambodia's rural poor (Diepart, 2015).

Second, the legal provisions within the 2001 Land Law established mechanisms through which land deemed unused could be reclassified as "state private land" and allocated to companies under ELCs.[33] These instruments have been used to transfer land to ELCs where political resistance is limited. However, several studies have documented problems with their implementation. Scheidel (2016) suggests that projected benefits to local communities were frequently overstated. United Nations reports have documented instances of forced displacement and inadequate compensation for families removed from land designated for ELC development (Leuprecht, 2007; Subedi, 2014). Diepart (2015) highlights a lack of transparency in ELC contracts, noting that many concessions exceeded their contractual boundaries. Logging activity by ELCs has extended beyond contractual boundaries (Diepart, 2015), contributing to deforestation (Pauly et al., 2022).

The broader context of land governance in Cambodia is shaped by historical patterns of political patronage. According to Un and So (2011), relationships between government actors and private interests have often blurred, with resource allocation used to consolidate political power. Within this framework, land concessions function as instruments of elite control (Un and So, 2011).

[33] Article 7 of the 2001 Land Law nullifies property claims prior to 1979, while Article 12 grants the State the authority to take control of land identified as unused (National Assembly of Cambodia, 2001). These provisions are reflected in official justifications documented in meetings with local villagers (Neef et al., 2013). In areas affected by landmines, the designation of land as unused may be more likely, particularly where historical claims predate 1979. Article 49 further stipulates that land allocated to ELCs may be cleared and used for agricultural or industrial purposes.

B Market Access

Use in our analysis. Chiovelli et al. (2025) show that landmine clearance in Mozambique improved economic development partly through increased market access. We examine the heterogeneous effects of clearance by accountability. Thus, in a robustness check, we add standardized market access as a control to our specification (equation (1)) to ensure that market access improvements do not confound the differential effects we document. The results are reported in Column 1 of Table A.11. Controlling for market access does not change our main findings. Moreover, clearance itself does not significantly affect market access in our setting (Table A.10).

Approach. We construct market access year-on-year (1992–2010) for locations following Chiovelli et al. (2025), hereafter CMP. We remove transport links in each year that remain barred by landmines. To build the transport map, we use information from 2002 on major and minor roads and the existing railways and rivers. In Cambodia, this is a reasonable picture of the transport network over our sample period. The main transport links did not change much during this time, with only major roads rehabilitated (JICA et al., 2006). Based on this map, we connect every origin (commune) to each of its reachable destinations. We start at each commune's centroid, find the nearest transport link that is unblocked, and consider the distance from the centroid to the nearest link as walking distance.

We snap edges on the transport map that connect if those edges are within 50 meters of each other.[34] We build the transport map once and then update it in each year by searching for hazards that have yet to be cleared.

[34] This smooths issues where a road connects to another, but something in the shapefile geometries does not quite connect them.

Market access measure. Following CMP, we measure market access based on the income of destinations weighted by a travel cost and a trade elasticity parameter (θ), capturing comparative advantage. We use the same approximation for market access $MA_{o,t}$ at origin o and time t as in CMP given by:

$$MA_{o,t} \equiv \sum_{d \neq o} \tau_{o,d,t}^{-\theta} N_{d,t}. \tag{3}$$

Market access is weighted by transportation costs ($\tau_{o,d,t}$) to each destination (d) in each period, scaled by trade elasticity. We use our commune luminosity measure ($N_{d,t}$) at each destination (d) and year (t) to construct market access year-on-year for each origin.

Travel cost. To estimate year-on-year travel cost for each origin-destination pair, we use the base transport map, removing in each year the edges (transport links) at points where minefields exist but have yet to be cleared. We adapt CMP's travel cost parameters to the Cambodian context. CMP normalize railway costs to 1 (cheapest) and set paved roads to 2, unpaved roads to 4, trails to 10, rivers to 15, and walking to 20. In Cambodia, we retain the same costs for paved roads (2), unpaved roads (4), rivers (15), and walking (20), but set the cost of railways to 15, because existing rail lines had been severely damaged during the decades of conflict, leaving bridges destroyed and tracks in disrepair (ADB, 2006). Major roads were relied on for most long-distance transport (Royal Government of Cambodia, 2002). As in CMP, we impose that a minefield within 100 meters of a transport route blocks that segment in years before clearance. We exclude rivers from this calculation, assuming rivers are mine-free, but mined connections to rivers can still block access.

Trade elasticity. Following Chiovelli et al. (2025), we adopt a trade elasticity of $\theta = 3.8$, a value near the midpoint of estimates in the trade literature for developing economies.

C Alternative Accountability Proxy: Khmer Rouge Productivity Shocks

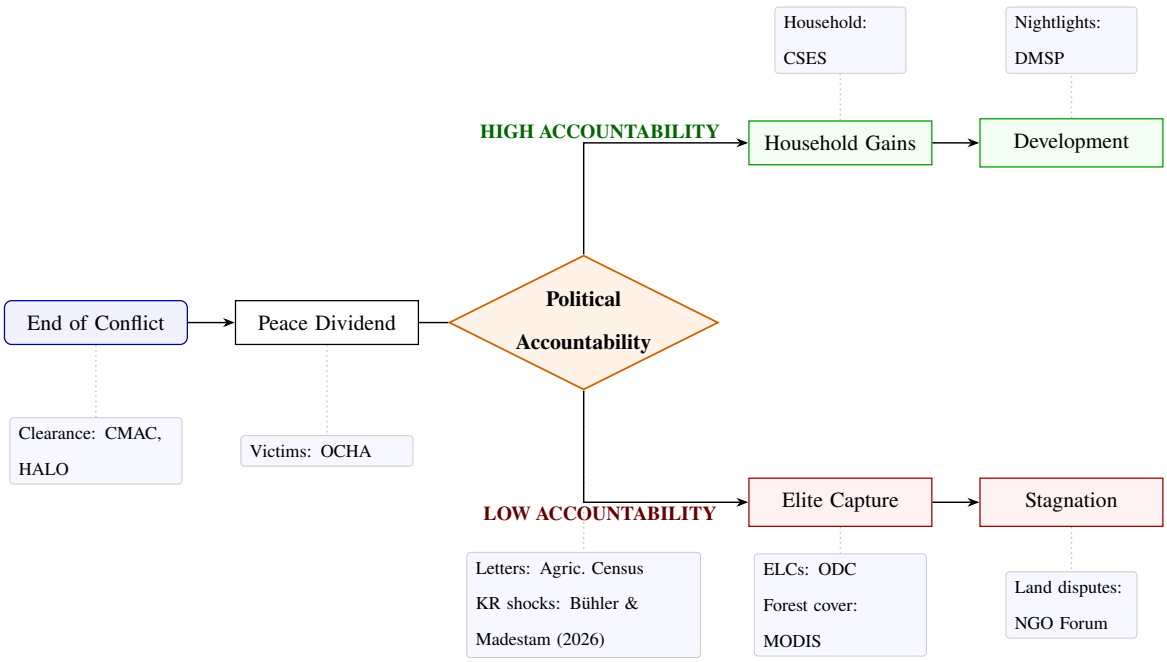
As described in Section 4 and Section 5.2, we verify our main results using an alternative proxy for accountability based on transient productivity shocks during the Khmer Rouge period (Bühler and Madestam, 2026). Under the Khmer Rouge, areas of higher rice productivity, identified through transient rainfall variation, experienced more forced labor, repression, violence, and destruction of social trust. Bühler and Madestam (2026) show that these communes today exhibit stronger democratic attitudes, higher opposition vote shares, and greater scrutiny of local officials, consistent with the collective memory of repression sustaining demand for political accountability.

Table A.7 reports the results. The same divergence emerges. In communes with high demand for accountability, clearance raises the probability of any nightlights by 4.7 percentage points ($\hat{\delta}_1 = 0.047$, $p < 0.01$, Column 2). The effect on log nightlights ($\hat{\delta}_1 = 0.373$, $p < 0.01$, Column 4) and winsorized log nightlights ($\hat{\delta}_1 = 0.439$, $p < 0.01$, Column 6) is similarly strong. The high-accountability point estimate is similar to the main specification, but the divergence between high- and low-accountability communes is if anything sharper: communes with low demand for accountability show a small *negative* effect on the probability of any nightlights ($\hat{\delta}_2 = -0.011$, $p < 0.05$, Column 2), and the difference is statistically significant across all outcomes ($p < 0.01$).[35]

[35] Both estimates of $\hat{\delta}_2$ are small in absolute magnitude (0.015 in the main specification, −0.011 here); the negative sign under the KR proxy is directionally consistent with the displacement channel documented in Section 7.

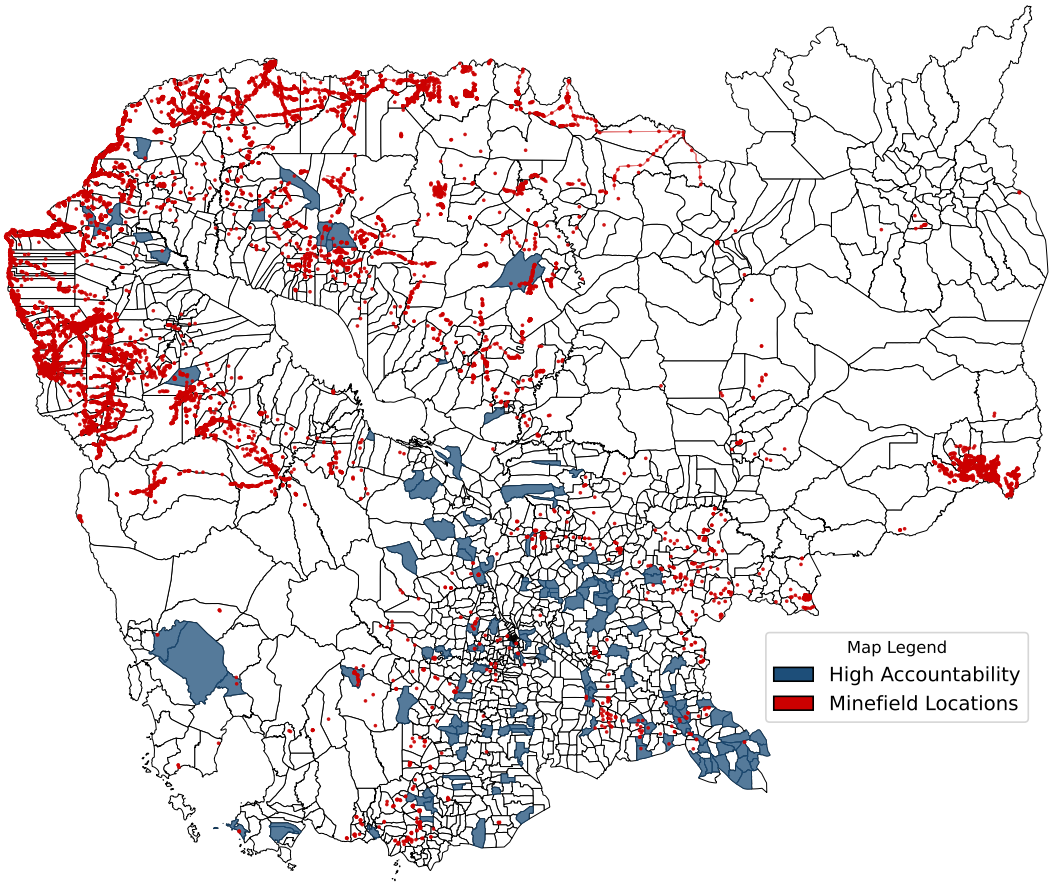
D Appendix Figures

Figure A.1: Data Sources



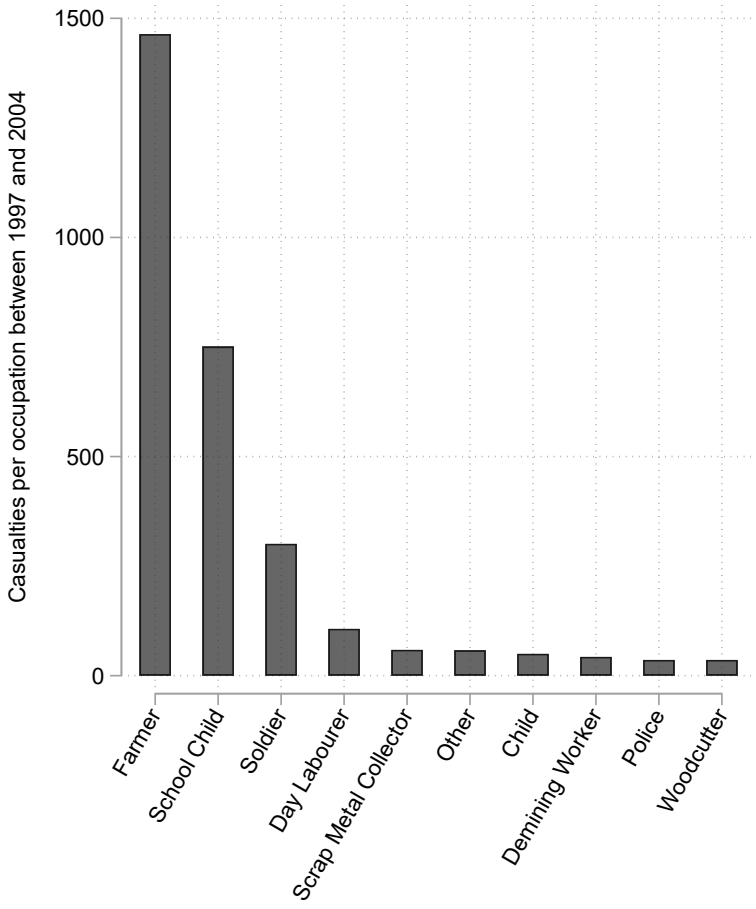
Notes: This figure reproduces the conceptual framework from Figure 1 and maps each data source to the corresponding element. See Table A.1 for variable definitions and data sources, and Table A.2 for summary statistics.

Figure A.2: Map – Minefields and Accountability



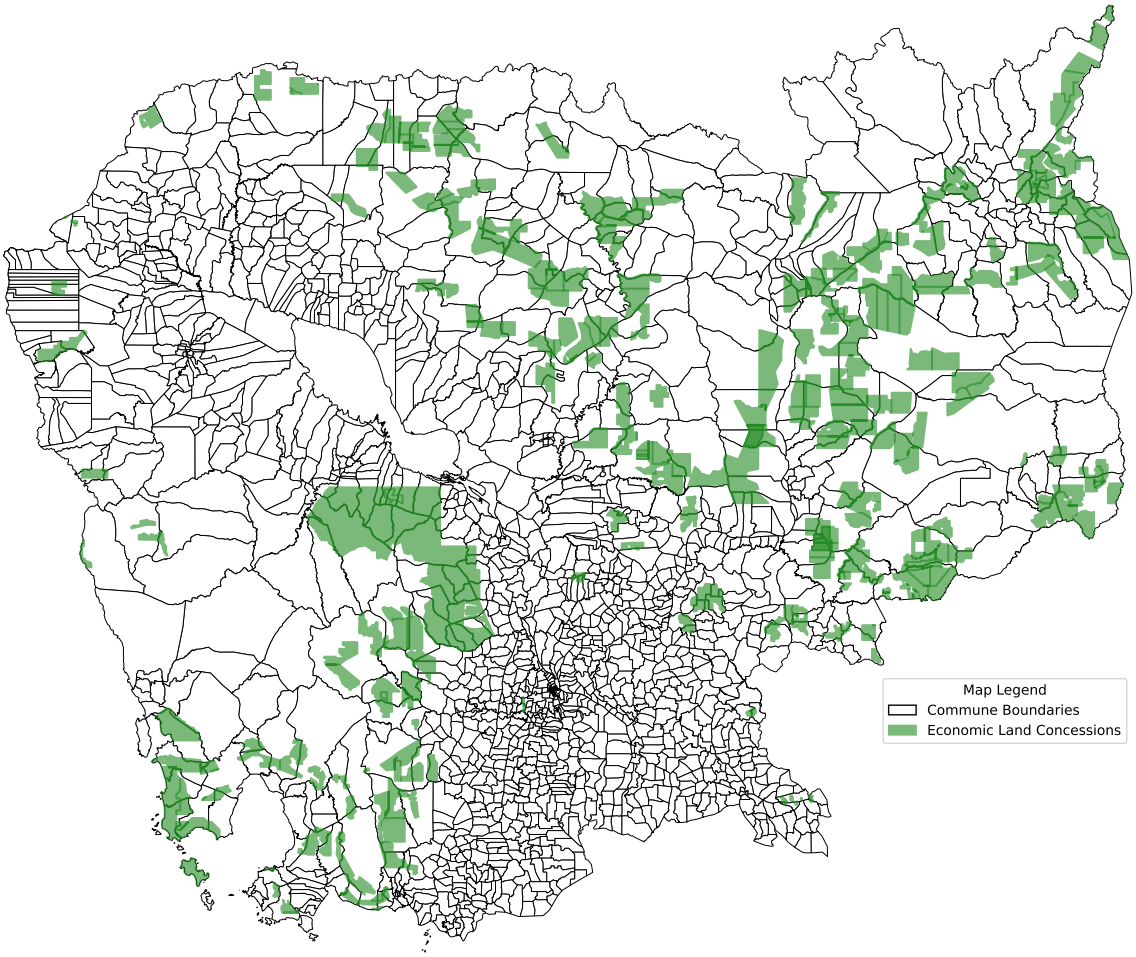
Notes: This map shows minefield centroids and commune borders. Data on minefields are from organizations coordinating mine clearance efforts in Cambodia (CMAC and The Halo Trust). We shade communes identified with 'high accountability', proxied by having a share of farmers with pre-2002 letters of possession above 33% based on data from the 2013 National Agricultural Census, in blue. Other communities are classified as 'low accountability' and are not shaded.

Figure A.3: Victimization by Occupation



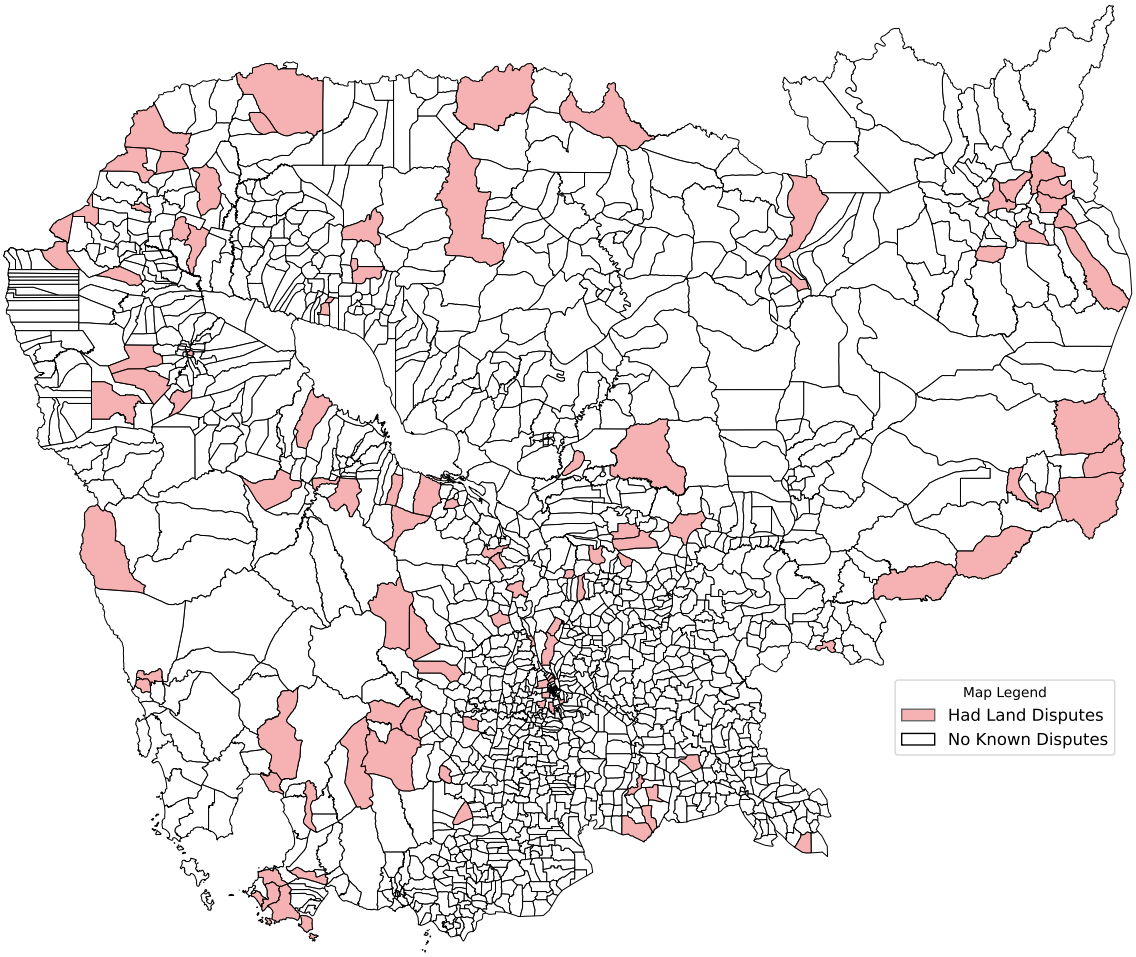
Notes: This figure plots the total number of recorded landmine casualties between 1997 and 2004 disaggregated by the victim's occupation. Data on landmine victims and occupation type are from the Office for the Coordination of Humanitarian Affairs (OCHA). The year range matches the lower bound of the victimization regression sample (Section 4) and the upper bound of occupation coverage in the data. The data reveal that the burden of victimization falls disproportionately on the civilian population, with farmers representing the single largest category of victims, followed by schoolchildren. This highlights the severe risk landmine contamination poses to agricultural labor and human capital accumulation.

Figure A.4: Map – Communes and ELC Locations



Notes: This map shows commune boundaries and Economic Land Concession (ELC) locations. Areas where ELCs operate are shaded green. ELC data are from LICADHO and Open Development Cambodia.

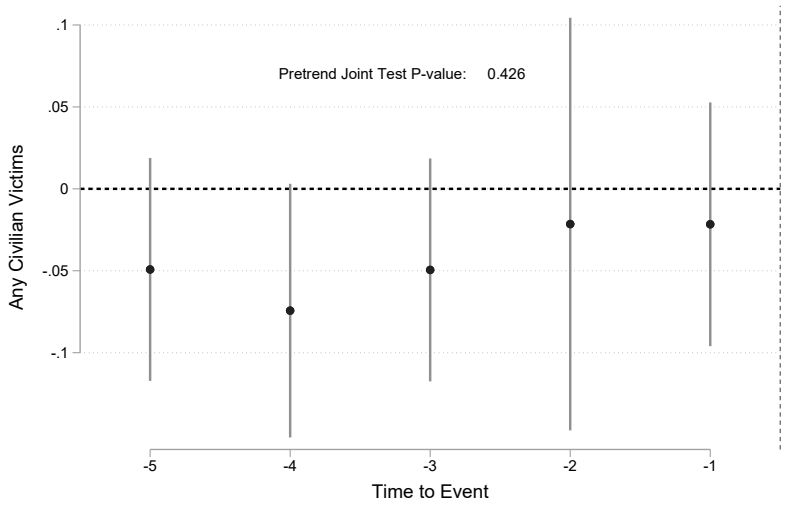
Figure A.5: Map – Communes and Land Disputes



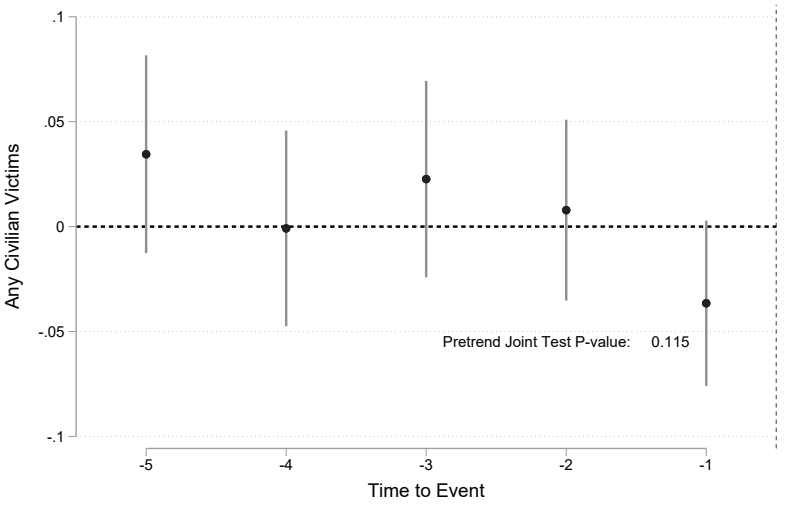
Notes: This map shows commune boundaries and communes with land disputes shaded in pink. Land dispute data are from the NGO Forum on Cambodia.

Figure A.6: Victimization: Pre-trends by Accountability

(a) Pre-trends in High Accountability Communes



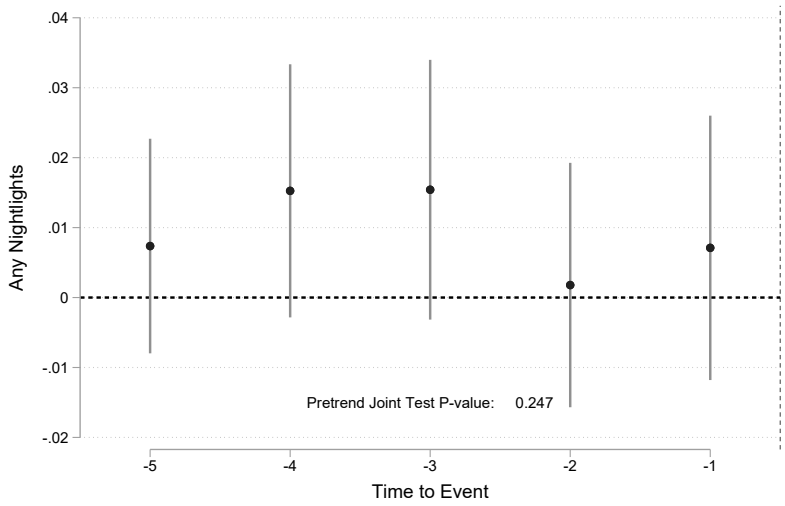
(b) Pre-trends in Low Accountability Communes



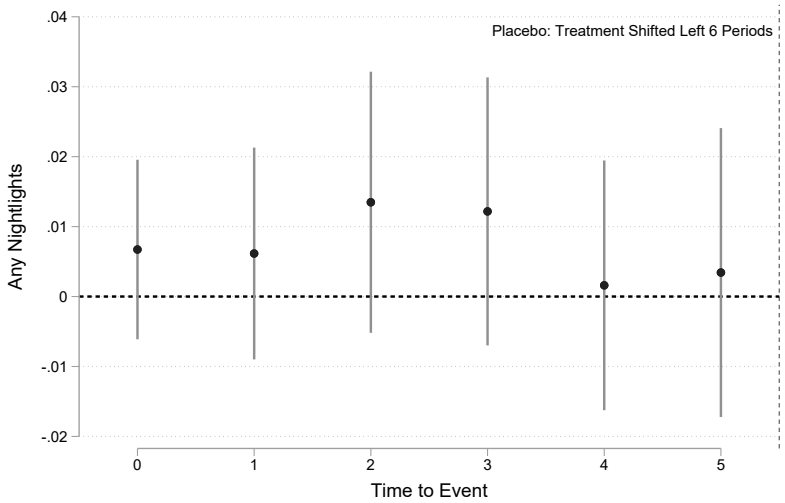
Notes: The outcome variable is an indicator for any civilian victims in a commune and year. Victimization regressions are restricted to 1997–2010, the period over which our civilian classification is consistently available. In Panel (a), we report the pre-trend coefficients for the effects of mine clearance among high accountability communes based on an event study generalization of Equation 2, following the DDI approach from Borusyak et al. (2024). In Panel (b), we report the pre-trend coefficients for the effects of mine clearance among low accountability communes based on an event study generalization of Equation 2, following the DDI approach from Borusyak et al. (2024). We include commune and province-year fixed effects as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Confidence intervals spanning zero indicate no significant association at the 5% level. Each panel reports the p-value from a joint test of the null that all pre-treatment coefficients are zero.

Figure A.7: Any Nightlights: Pre-trends and Anticipation Placebos

(a) Pre-trends

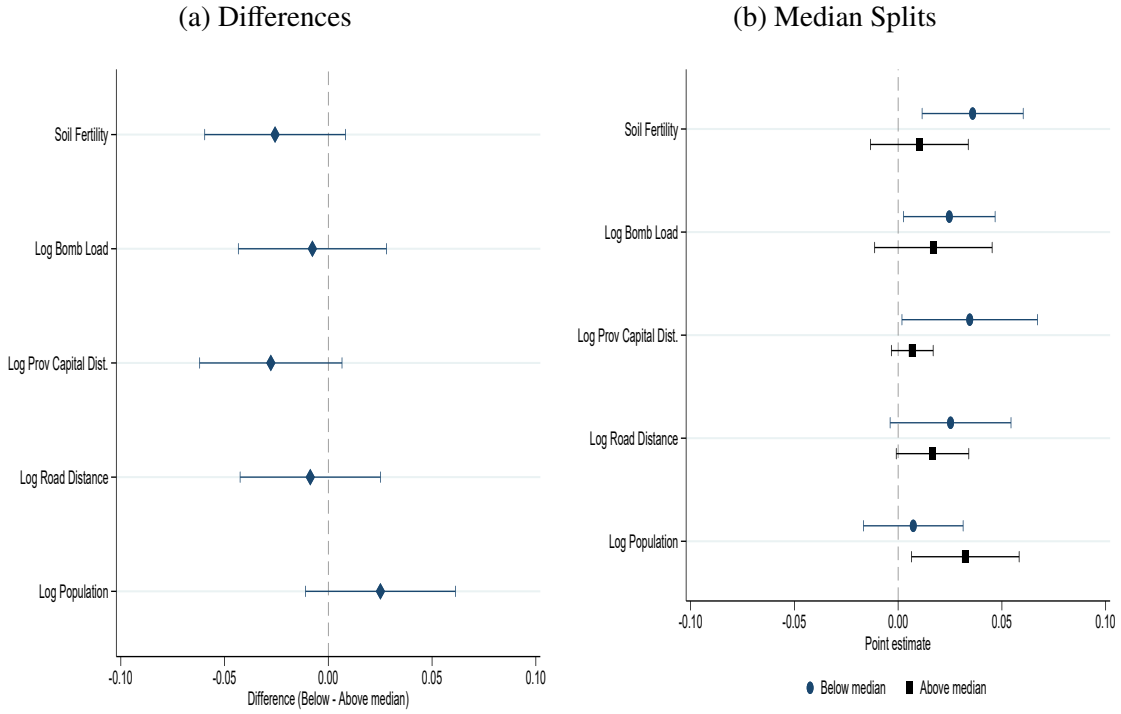


(b) Anticipation Placebos



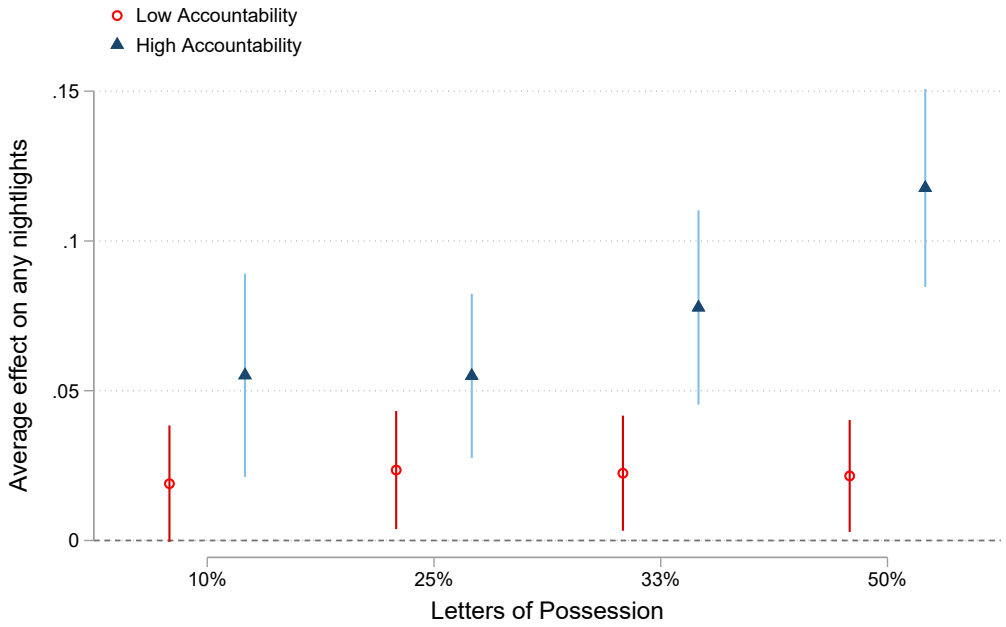
Notes: The outcome variable is an indicator for whether any nightlights are visible in a commune and year. In Panel (a), we report the pre-trend coefficients for the effects of mine clearance based on an event study generalization of Equation 2, following the DDI approach from Borusyak et al. (2024). In Panel (b), we report coefficients from an anticipation placebo that shifts the treatment to six years before any mine clearance in the commune, based on Equation 2, following Borusyak et al. (2024). We include commune and province-year fixed effects as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Confidence intervals spanning zero indicate no significant association at the 5% level. Panel (a) reports the p-value from a joint test of the null that all pre-treatment coefficients are zero.

Figure A.8: Placebo Splits



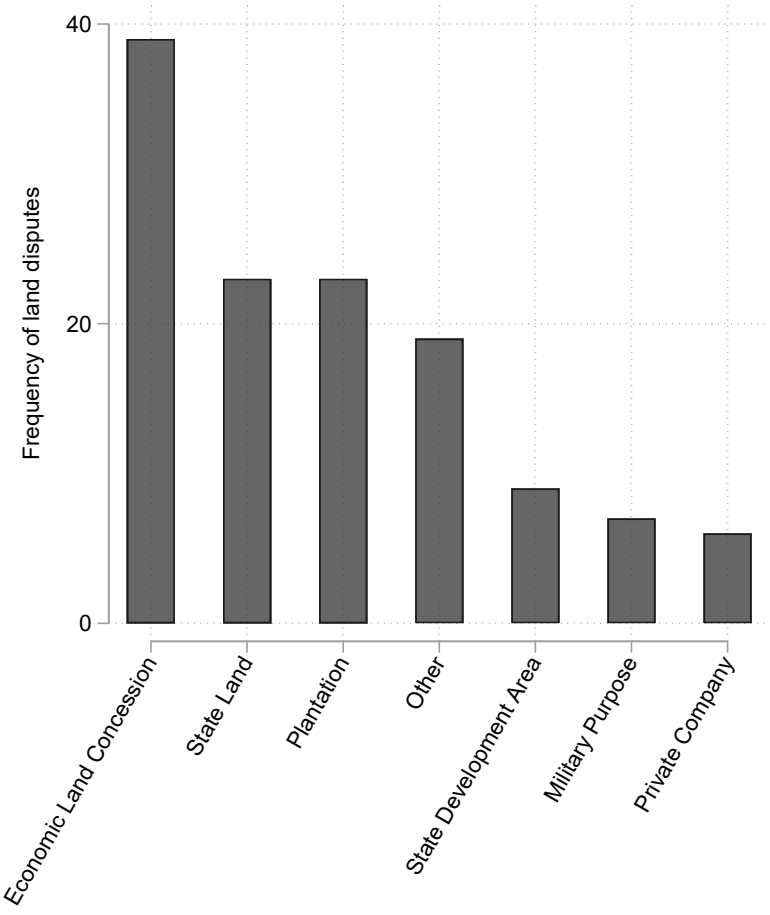
Notes: Panel (a) shows the difference in the estimated treatment effect (mine clearance) between communes above and below the median of the split variable, along with 95% confidence intervals. A positive value indicates a larger effect in above-median communes; a negative value indicates a larger effect in below-median communes. Panel (b) shows the estimated average treatment effect of mine clearance separately for communes below and above the median of the split variable, along with 95% confidence intervals. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects, as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level.

Figure A.9: Robustness Checks: Accountability Cutoffs – Nightlights



Notes: This figure plots the δ_1 (high accountability) and δ_2 (low accountability) point estimates and 95% confidence intervals from Equation 1 for the any-nightlights outcome, using alternative cutoffs for the share of farmers in the commune holding pre-2002 letters of possession. At each cutoff (10%, 25%, 33%, and 50%), high-accountability communes are those at or above the cutoff; low-accountability communes are the rest. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects, as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Confidence intervals not spanning zero indicate significance at the 5% level.

Figure A.10: Land Disputes by Cause



Notes: This bar chart shows the number of land disputes in the sample by cause. The data on land disputes were obtained from The NGO Forum on Cambodia and cover all communes in Cambodia from 1992 to 2010.

E Appendix Tables

Table A.1: Variable Definitions and Sources

Variable	Description	Source
Treatment variables		
End Clearance	Indicator equal to 1 for commune-years after all minefields in the commune have been fully cleared, and 0 otherwise.	Cambodian Mine Action Centre (CMAC) / The Halo Trust (HALO)
High Accountability	Indicator equal to 1 if the share of farming households with pre-2002 letters of possession exceeds 33%, and 0 otherwise. Alternative cutoffs are used in robustness tests.	National Census of Agriculture 2013
Khmer Rouge Productivity Shock	Alternative accountability proxy based on transient local productivity shocks during the Khmer Rouge regime (1975–1979) that predict demand for accountability.	Bühler and Madestam (2026)
Outcome variables: victimization		
Any Civilian Victims	Indicator equal to 1 if there were any civilian victims from mine-related accidents in a commune-year, and 0 otherwise.	OCHA / Open Development Cambodia
Number of Civilian Victims	The number of civilian victims from mine-related accidents in each commune-year.	Office for the Coordination of Humanitarian Affairs (OCHA) / Open Development Cambodia
Log Civilian Victims	Log of the number of civilian victims from mine-related accidents in each commune-year, defined as log(Number of Civilian Victims + 1).	OCHA / Open Development Cambodia
Outcome variables: economic development		
Any Nightlights	Indicator equal to 1 if the mean corrected nighttime luminosity in the commune exceeds 1, and 0 otherwise.	DMSP / Li et al. (2020), bloom and top-code corrections from Chiovelli et al. (2025)
Log Nightlights	Log nighttime luminosity in each commune-year, defined as log(Nightlights + 0.0001).	DMSP / Li et al. (2020), bloom and top-code corrections from Chiovelli et al. (2025)

Table A.1 continued from previous page

Variable	Description	Source
Log Nightlights (winsorized)	Log nighttime luminosity in each commune-year with very small luminosity values removed to reduce low-end measurement noise, defined as log(Nightlights + 0.0001) after winsorization.	DMSP / Li et al. (2020), bloom and top-code corrections from Chiovelli et al. (2025)
Mechanism variables: elite capture		
Any ELC	Indicator equal to 1 if an Economic Land Concession was present in a commune-year, and 0 otherwise.	Cambodian League for the Promotion and Defense of Human Rights (LICADHO) / Open Development Cambodia
Log ELC Area	Log of total Economic Land Concession area in a commune-year, defined as log(ELC Area + 1).	LICADHO / Open Development Cambodia
Forest Cover	The minimum level of the Normalized Difference Vegetation Index (NDVI) in each commune-year. Available 2000–2010.	MODIS/Terra Vegetation Indices 16-Day L3 Global 250m
Mechanism variables: land disputes		
Any Disputes	Indicator equal to 1 if there were any ongoing land disputes in a commune-year, and 0 otherwise.	The NGO Forum on Cambodia
Disputes	The cumulative number of ongoing land disputes in each commune-year.	The NGO Forum on Cambodia
Log Disputes	Log of the number of ongoing land disputes in each commune-year, defined as log(Disputes + 1).	The NGO Forum on Cambodia
Mechanism variables: household outcomes (CSES)		
Hours Worked	Total hours worked in the past seven days, averaged across working-age individuals at the commune level.	Cambodia Socio-Economic Survey (CSES)
Log Hours Worked	Log of total hours worked in the past seven days, averaged at the commune level.	CSES

Table A.1 continued from previous page

Variable	Description	Source
Log Consumption	Log of household consumption expenditure, averaged at the commune level, defined as $\log(\text{Consumption} + 1)$.	CSES
Control variables		
Longitude	Longitude of the commune centroid, in degrees.	QGIS
Latitude	Latitude of the commune centroid, in degrees.	QGIS
XY Interacted	Longitude and Latitude interacted.	QGIS
Log Tons of Bombs	Log tonnage of US bombs dropped on the commune.	Yale CGP
Log Distance to Road (km)	Log average distance to a road in kilometers.	Yale CGP
Log Distance to Province Capital	Log average distance to the province capital in kilometers.	QGIS
Log Pre-KR Population	Log of pre-Khmer Rouge commune population, proxied by the number of huts per area.	Yale CGP
Soil Fertility	Share of the commune where soil fertility is classified as high by Save Cambodia's Wildlife's Atlas Working Group.	Open Development Cambodia
Market Access	Time-varying market access measure constructed following Chiovelli et al. (2025). See Appendix B for details.	Authors' calculations
Standardized Market Access	Z-score standardized version of Market Access, used as a control in robustness specifications.	Authors' calculations

Table A.2: Summary Statistics – Main Sample

	Mean	SD	Count	Min	Max
Treatment variables					
End Clearance	0.09	0.29	28263	0.00	1.00
High Accountability	0.11	0.31	30186	0.00	1.00
Khmer Rouge Productivity Shock	0.50	0.50	28263	0.00	1.00
Outcome variables					
Any Civilian Victims	0.07	0.26	20420	0.00	1.00
Number of Civilian Victims	0.26	1.98	20420	0.00	97.00
Log Civilian Victims	0.09	0.37	20420	0.00	4.58
Any Nightlights	0.05	0.21	28198	0.00	1.00
Log Nightlights	-8.26	2.92	28198	-9.21	4.42
Log Nightlights (winsorized)	-8.41	2.80	28198	-9.21	4.42
Mechanism variables					
Any ELC	0.04	0.20	28263	0.00	1.00
Log ELC Area	0.47	2.16	28263	0.00	12.77
Forest Cover	-0.05	0.15	15883	-0.20	0.39
Any Disputes	0.09	0.28	30411	0.00	1.00
Number of Disputes	0.02	0.17	28263	0.00	5.00
Log Disputes	0.01	0.10	28263	0.00	1.79
Hours Worked	43.27	11.35	2148	8.38	94.23
Log Hours Worked	3.73	0.29	2148	2.13	4.55
Log Consumption	11.92	0.70	1809	10.10	13.98
Control variables					
Longitude	104.87	0.93	30411	102.38	107.51
Latitude	12.01	0.96	30411	10.44	14.41
XY Interacted	1259.54	101.06	30411	1090.46	1535.32
Log Tons of Bombs	4.97	3.20	30411	0.00	12.08
Log Distance to Road (km)	0.43	1.33	30411	-6.91	3.79
Log Distance to Province Capital	2.48	2.70	30411	-6.91	4.83
Log Pre-KR Population	5.23	1.35	30411	-5.63	7.65
Soil Fertility	0.43	0.43	30411	0.00	1.00
Market Access	0.00	0.00	27628	0.00	0.02
Standardized Market Access	0.00	1.04	27628	-0.03	43.73

Notes: This table presents summary statistics for our analytical sample, covering the years 1992 to 2010. Civilian-victim outcomes are defined only for 1997–2010, the period over which our civilian classification is consistently available; accordingly, the victim-variable statistics in this table reflect the 1997–2010 subsample. Covariates are pre-determined, measured before the start of the sample period.

Table A.3: Correlation Between Accountability Proxies

	Accountability: Share of Farmers		High Accountability	
	(1)	(2)	(3)	(4)
More Productive During Khmer Rouge	0.047***	0.047***	0.026***	0.026***
	(0.015)	(0.015)	(0.009)	(0.009)
Province Fixed Effects	✓	✓	✓	✓
Commune-Level Controls		✓		✓
Number of Communes	1621	1621	1621	1621
Dep. Var. Pre-Treatment Mean	0.069	0.069	0.068	0.068

Notes: This table regresses our main measures of local accountability, based on letters of possession, on the Khmer Rouge productivity shock proxy from Bühler and Madestam (2026). In Columns (1)–(2), the outcome is the share of farming households with pre-2002 letters of possession. In Columns (3)–(4), the outcome is an indicator for communes with a share above 33%. All specifications include province fixed effects. Columns (2) and (4) add commune-level controls: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are robust to heteroskedasticity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.4: Orthogonality of Accountability and Landmine Clearance

	Share of Farmers with pre-2002 Letters of Possession						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Has Minefield	-0.0034						
	(0.0111)						
# Mines		-0.0000					
		(0.0000)					
log Mine Area			-0.0018				
			(0.0025)				
log Mine Perimeter				-0.0022			
				(0.0031)			
Start Year					-0.0014		
					(0.0016)		
End Year						-0.0013	
						(0.0017)	
Duration (Years)							-0.0005
							(0.0014)
Province Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Commune-Level Controls	✓	✓	✓	✓	✓	✓	✓
Number of Communes	1,621	1,621	551	551	551	551	546
Outcome Mean	0.0965	0.0965	0.0720	0.0720	0.0720	0.0720	0.0723

Notes: This table presents cross-sectional regressions of the share of farmers in a commune with pre-2002 letters of possession on demining activities and minefield characteristics. The reverse of Table 2, this specification tests whether clearance assignment, intensity, or timing predicts the accountability proxy. An observation is a commune. In Columns (1)–(2), we use all communes and assess whether the presence or number of minefields predicts the letters share. In Columns (3)–(4), the sample is restricted to communes with minefields, where we assess whether minefield size predicts the letters share. In Columns (5)–(7), we again restrict to communes with minefields and assess whether the start year, end year, or duration of clearance predicts the letters share. Province fixed effects and commune-level controls (latitude, longitude, their interaction, log US bombing loads, log distance to the nearest road, log distance to the provincial capital, log pre-Khmer Rouge commune population, and soil fertility) are included. Standard errors are robust to heteroskedasticity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.5: Average Effects of Clearance – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared	0.027***	0.020**	0.250**	0.191**	0.252**	0.201**
	(0.010)	(0.009)	(0.102)	(0.094)	(0.106)	(0.096)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	28,148	28,148	28,148	28,148	28,148	28,148
Clusters	1,613	1,613	1,613	1,613	1,613	1,613
Dep. Var. Pre-Treatment Mean	0.029	0.029	-8.565	-8.565	-8.688	-8.688

Notes: This table reports the δ estimates from Equation 2 for the effect of completed minefield clearances on local economic development measured by satellite-based nightlights (NTL). We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights, defined as log(Nightlights + 0.0001), and the log of winsorized nightlights, which removes very small luminosity values to reduce low-end measurement noise before applying the same transformation. We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. All specifications are estimated using the DDI approach by Borusyak et al. (2024). Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.6: Victimization and Accountability

	Any Civilian Victims		Civilian Victims		log Civilian Victims	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	-0.026	-0.028	-0.208	-0.319**	-0.057	-0.066
	(0.030)	(0.030)	(0.160)	(0.155)	(0.045)	(0.043)
Cleared × Low Accountability	-0.096***	-0.088***	-0.949***	-0.878***	-0.175***	-0.159***
	(0.023)	(0.022)	(0.188)	(0.183)	(0.034)	(0.033)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	19,188	19,188	19,188	19,188	19,188	19,188
Clusters	1,464	1,464	1,464	1,464	1,464	1,464
Dep. Var. Pre-Treatment Mean	0.210	0.210	1.137	1.137	0.305	0.305

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on victimization as a function of local accountability. The outcomes are an indicator for any civilian victim within a commune and year, the number of civilian victims, and the log civilian victims, defined as log(Number of Civilian Victims + 1). Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. Victimization regressions are restricted to 1997–2010, the period over which our civilian classification is consistently available. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7: Robustness Checks: Alternative Proxy for Accountability – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
High Productivity Shocks During KR	0.059***	0.047***	0.487***	0.373***	0.546***	0.439***
	(0.015)	(0.014)	(0.157)	(0.137)	(0.165)	(0.144)
Low Productivity Shocks During KR	-0.009**	-0.011**	-0.025	-0.019	-0.087	-0.074
	(0.004)	(0.005)	(0.070)	(0.083)	(0.068)	(0.072)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	28,148	28,148	28,148	28,148	28,148	28,148
Clusters	1,613	1,613	1,613	1,613	1,613	1,613
Dep. Var. Pre-Treatment Mean	0.026	0.026	-8.650	-8.650	-8.752	-8.752
Difference High and Low Acc	0.068	0.058	0.512	0.392	0.633	0.513
P-value on difference	0.000	0.000	0.002	0.009	0.000	0.001

Notes: This table reports estimates from an alternative-proxy specification analogous to Equation 1, replacing the letters-of-possession accountability proxy with the Khmer Rouge productivity shock measure from Bühler and Madestam (2026). The first row reports the effect of clearance in communes that experienced high productivity shocks during the Khmer Rouge (indicating higher demand for accountability), while the second row reports the effect in communes with low productivity shocks. The outcomes are an indicator for any nightlights in a commune, the log of nightlights, defined as $\log(\text{Nightlights} + 0.0001)$, and the log of winsorized nightlights. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.8: Robustness Checks: Continuous Accountability – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × Accountability	0.111***	0.113***	0.418	0.332	0.637	0.569
	(0.041)	(0.040)	(0.390)	(0.367)	(0.389)	(0.363)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Clearance Treatment	✓	✓	✓	✓	✓	✓
Observations	28,148	28,148	28,148	28,148	28,148	28,148
Clusters	1,613	1,613	1,613	1,613	1,613	1,613
Dep. Var. Pre-Treatment Mean	0.029	0.029	-8.565	-8.565	-8.688	-8.688

Notes: This table reports robustness checks for the effect of completed minefield clearances interacted with a continuous measure of accountability on local economic development measured by satellite-based nightlights (NTL). We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights, defined as log(Nightlights + 0.0001), and the log of winsorized nightlights, which removes very small luminosity values to reduce low-end measurement noise before applying the same transformation. All specifications include our completed clearance indicator from our baseline specifications and are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.9: Robustness Checks: Alternative Accountability Measure – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.070***	0.066***	0.408***	0.348***	0.478***	0.432***
	(0.017)	(0.016)	(0.116)	(0.089)	(0.119)	(0.094)
Cleared × Low Accountability	0.023**	0.015	0.237**	0.178*	0.233**	0.180*
	(0.010)	(0.009)	(0.103)	(0.094)	(0.108)	(0.097)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	28,139	28,139	28,139	28,139	28,139	28,139
Clusters	1,613	1,613	1,613	1,613	1,613	1,613
Dep. Var. Pre-Treatment Mean	0.026	0.026	-8.650	-8.650	-8.752	-8.752
Difference High and Low Acc	0.047	0.051	0.171	0.170	0.245	0.252
P-value on difference	0.015	0.005	0.253	0.160	0.114	0.049

Notes: This table reports the estimates from Equation 1 for the effects of completed minefield clearances on local economic development measured by satellite-based nightlights (NTL), using an alternative accountability measure. Accountability is proxied by the commune-level share of agricultural landholdings with pre-2002 letters of possession (rather than the share of farmers, as in our main measure), with high accountability defined as above 33%. We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights, defined as $\log(\text{Nightlights} + 0.0001)$, and the log of winsorized nightlights. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10: Robustness Checks: Clearance Effects on Market Access

	Market Access		Standardized MA	
	(1)	(2)	(3)	(4)
Cleared × High Accountability	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.001)	(0.001)
Cleared × Low Accountability	0.000	0.000	0.001	0.001
	(0.000)	(0.000)	(0.001)	(0.001)
Commune Fixed Effects	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓
Observations	27,578	27,578	27,578	27,578
Clusters	1,583	1,583	1,583	1,583
Dep. Var. Pre-Treatment Mean	0.000	0.000	-0.033	-0.033
Difference High and Low Acc	-0.000	-0.000	-0.002	-0.002
P-value on difference	0.360	0.314	0.361	0.361

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on market access, disaggregated by accountability. Columns (1) and (2) use the raw market access measure; Columns (3) and (4) use the standardized (z-score) version. Odd columns exclude commune-level controls interacted with year; even columns include them. Market access is constructed following Chiovelli et al. (2025) as described in Appendix B. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.11: Robustness Checks: Alternative Specifications – Nightlights

	Any NTL				
	Control Market Access	Aggregate Outcome to District-Level	Control District-Year FE	Control Accountability-Year FE	Drop Top 10% Clearance Duration
	(1)	(2)	(3)	(4)	(5)
Cleared × High Accountability	0.073***	0.032***	0.049**	0.046**	0.078***
	(0.016)	(0.010)	(0.020)	(0.018)	(0.016)
Cleared × Low Accountability	0.013	0.009	0.014*	0.018*	0.015
	(0.008)	(0.006)	(0.008)	(0.009)	(0.010)
Commune Fixed Effects	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓		✓	✓
Controls × Year Fixed Effects	✓	✓	✓	✓	✓
Observations	27,578	28,167	27,842	28,148	26,986
Clusters	1,583	1,614	1,613	1,613	1,451
Dep. Var. Pre-Treatment Mean	0.023	0.026	0.026	0.026	0.030
Difference High and Low Acc	0.060	0.023	0.036	0.029	0.063
P-value on difference	0.001	0.047	0.087	0.160	0.001

Notes: This table reports robustness checks for the effect of completed minefield clearances disaggregated by accountability on an indicator for any nightlights in a commune. In Column (1), we control for standardized market access in communes developed in Appendix B. In Column (2), we aggregate the outcome to the district level to capture spillovers, while leaving treatment variation at the commune level. We then replace province-year fixed effects with district-year fixed effects in Column (3). In Column (4), we account for year-by-accountability fixed effects, allowing for differential trends by commune accountability type. Finally, in Column (5), we drop communes in the top 10% of clearance duration. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects (replaced by district-year FE in Column 3) in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.12: Robustness Checks: Only Ever Treated Controls – Victimization

	Any Civilian Victims		Civilian Victims		log Civilian Victims	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.007	-0.136*	0.063	-0.800**	0.014	-0.181**
	(0.042)	(0.075)	(0.182)	(0.321)	(0.052)	(0.084)
Cleared × Low Accountability	-0.080**	-0.153***	-0.460**	-0.468**	-0.104**	-0.153***
	(0.035)	(0.041)	(0.211)	(0.206)	(0.050)	(0.050)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	3,711	3,711	3,711	3,711	3,711	3,711
Clusters	394	394	394	394	394	394
Dep. Var. Pre-Treatment Mean	0.210	0.210	1.137	1.137	0.305	0.305

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on victimization as a function of local accountability. In these specifications, the sample is restricted to only include communes that are at some point cleared of landmines. The outcomes are an indicator for any civilian victim within a commune and year, the number of civilian victims, and the log civilian victims, defined as log(Number of Civilian Victims + 1). Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. Victimization regressions are restricted to 1997–2010, the period over which our civilian classification is consistently available. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.13: Robustness Checks: Only Ever Treated Controls – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.081***	0.072***	0.540***	0.219	0.583***	0.395***
	(0.016)	(0.016)	(0.110)	(0.136)	(0.105)	(0.129)
Cleared × Low Accountability	0.012	-0.005	0.100	-0.129	0.228*	0.036
	(0.012)	(0.012)	(0.116)	(0.111)	(0.123)	(0.116)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year Fixed Effects		✓		✓		✓
Observations	7,073	7,073	7,073	7,073	7,073	7,073
Clusters	543	543	543	543	543	543
Dep. Var. Pre-Treatment Mean	0.029	0.029	-8.565	-8.565	-8.688	-8.688
Difference High and Low Acc	0.070	0.077	0.439	0.347	0.355	0.359
P-value on difference	0.001	0.000	0.006	0.021	0.027	0.019

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on local economic development measured by satellite-based nightlights (NTL) as a function of local accountability. In these specifications, the sample is restricted to only include communes that are at some point cleared of landmines. Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession above 33%. We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights, defined as $\log(\text{Nightlights} + 0.0001)$, and the log of winsorized nightlights, which removes very small luminosity values to reduce low-end measurement noise before applying the same transformation. All specifications are estimated using the DDI approach by Borusyak et al. (2024). We include commune and province-year fixed effects in all specifications, as well as pre-existing commune characteristics interacted with year fixed effects where indicated: latitude, longitude, their interaction, the log of US bombing loads, log distance to the nearest road, log distance to the provincial capital, the log of pre-Khmer Rouge commune population, and soil fertility. Standard errors are clustered at the commune level. Pre-Treatment Mean reports the mean of the outcome among minefield communes in the years before clearance was completed.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.