Political Accountability and the Returns to Peace*

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Abstract

Why do some societies recover from armed conflict much better than others? We provide evidence that political accountability is a key determinant of whether post-conflict economies realize the peace dividend. We study Cambodia, where a nationwide landmine clearance campaign created large local surpluses by reducing victimization and expanding arable land. Whether this surplus translated into development or conflict depended on accountability. Using a staggered difference-in-differences strategy, we show that in areas with strong pre-existing checks and balances on political elites, clearance raised economic output. Where accountability was weak, clearance produced no economic gains but triggered land disputes. Elite capture explains the divergence. In low-accountability areas, clearance increased land concessions and deforestation. Where accountability was strong, households instead benefited through higher consumption. Post-conflict recovery requires not just the creation of economic potential but accountability over its distribution.

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1 Introduction

How well societies 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, some countries such as Vietnam (Miguel and Roland, 2011) or Rwanda (Hodler, 2019) have recovered rapidly following conflict, consistent with standard models of convergence (Solow, 1956; Davis and Weinstein, 2002). What determines whether an economy recovers from conflict or stagnates?

We study political accountability as a determinant of post-conflict recovery. Economic theory implies that checks and balances on political elites can promote development by ensuring a more equitable distribution of the "peace dividend" — the economic opportunities arising from post-conflict stabilization (Rohner and Thoenig, 2021). While the end of conflict typically generates significant returns, their concentration among a narrow elite could stifle long-run growth (North and Weingast, 1989; Djankov et al., 2003) and reignite conflict by impeding peaceful bargaining over surplus (Garfinkel and Skaperdas, 2007). Conversely, an equitable distribution of the peace dividend could raise the opportunity cost of fighting and foster development (Dube and Vargas, 2013). Figure 1 illustrates this logic. However, empirical evidence on the institutional determinants of post-conflict recovery remains scarce (Rohner et al., 2025).

Testing this prediction is challenging. The peace dividend is typically observed only when it translates into development. If elite capture diverts it, no surplus appears to have existed. 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 by exploiting shocks to the peace dividend that

are both observable and plausibly orthogonal to political accountability. In post-conflict Cambodia, a nationwide landmine clearance campaign led by international organizations creates plausibly exogenous shocks to local surplus over space and time. We interact these shocks with cross-sectional variation in pre-existing political accountability to test whether the peace dividend translates into development only where political elites face checks and balances.

The shocks to surplus come from the staggered roll-out of Cambodia's landmine clearance campaign, the country's largest development program since the end of the last conflict in 1991. Following decades of conflict, landmines made vast areas of agricultural land unusable. Their removal expanded the supply of arable land, generating large potential gains for the largely agrarian population.[1] But the sudden availability of high-value land also created opportunities for elite capture. Following the genocide by the Khmer Rouge in 1975–1979 and the subsequent civil conflict until 1991, the country today remains ruled by a consolidated elite in a weak institutional environment (Bühler and Madestam, 2026).

Our identification strategy exploits the independence of the two sources of variation in this setting. While clearance timing was set top-down by international organizations, independently of local political conditions, significant historical differences exist within Cambodia in the degree of local checks and balances placed on political elites. These differences emerged bottom-up from communities' experiences under the Khmer Rouge. 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. We carefully validate three key assumptions: that clearance constitutes an exogenous shock to surplus, that clearance timing is orthogonal to pre-existing accountability, and that the returns

[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). The country's severe landmine contamination has been a major obstacle to development in this highly agrarian economy both during and after the conflict.

to clearance are not driven by correlates of accountability other than accountability itself.

To implement our empirical strategy, we assemble a yearly panel covering all 1,621 Cambodian communes from 1992 to 2010. We measure pre-existing political accountability in two ways. Our first measure is the share of farmers with letters of possession, informal documents issued by village chiefs recognizing land occupancy after the Khmer Rouge destroyed all property records during the genocide in 1975–1979. They carry no collateral value and thus no direct economic significance, making their prevalence unlikely to reflect differences in land values or economic potential. Instead, these letters signal a strong bottom-up demand for political accountability (Hem, 2019). Crucially, they establish a recognized claim to land, making it harder for elites to reclassify occupied territory as state property and transfer it to private interests. As an alternative proxy, we use transient rainfall shocks during the Khmer Rouge period (1975–1979), which intensified repression, dismantled social trust, and generated higher demand for accountability without independently affecting long-run productivity (Bühler and Madestam, 2026). We complement these measures with data on clearance activities, outcomes, and mechanisms.

We first establish that clearance creates a local surplus. Using a staggered difference-in-differences strategy (following Borusyak et al., 2024; Chiovelli et al., 2025), we show that clearance immediately reduces civilian casualties by 26%, consistent with an expansion of agricultural potential. This effect is driven by farmers and schoolchildren, with no pre-trends or anticipation effects.

But does this surplus translate into economic development? Whether it does is ex ante unclear. If clearance simply removes a physical barrier to production, standard models predict convergence regardless of local institutions. But if newly available land is vulnerable to capture, development may depend on whether political elites face checks and balances. Our results support the latter. In communes with high political accountability, clearance

raises the probability of any nightlights by 4.1 percentage points. In communes with low accountability, clearance produces no detectable economic gains but triggers a significant increase in land disputes.

These results hold when we replace our accountability measure with the alternative proxy based on transient Khmer Rouge-era rainfall shocks, providing independent confirmation that the divergence reflects accountability rather than latent economic potential. They are also robust across alternative specifications, accountability cutoffs, and a rich set of economic and geographic controls.

We trace this divergence to elite capture. Cambodia's Economic Land Concessions (ELCs), large-scale, long-term leases granted through opaque processes to politically connected actors, provide a visible measure of rent extraction (Diepart and Schoenberger, 2016; Wang et al., 2023). In low-accountability communes, clearance increases ELCs, reduces forest cover, and reduces hours worked. In high-accountability communes, clearance raises household consumption without increasing conflict or concessions. Accountability constrains elite capture and channels the peace dividend toward households.

These findings contribute to several literatures. First, we contribute to the literature on the economic causes and consequences of conflict (e.g., Rodrik, 1999; 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 begun to estimate the economic impacts of specific post-conflict policies (Rohner et al., 2025), including landmine clearance programs in Mozambique (Chiovelli et al., 2025) and Colombia (Prem et al., 2025), and security transitions in Afghanistan (Fetzer et al., 2021). Chiovelli et al. (2025) show that clearance in Mozambique raised economic activity through direct productivity gains and improved market access, but do not examine the role of institutions in shaping these returns. Rohner et al. (2025) argue that the peace dividend from development

policies remains "elusive" precisely because economic interventions interact with political institutions in ways that are poorly understood empirically. We provide evidence for this interaction: the same policy generates development where political elites face accountability and elite capture where they do not. A key feature of our setting is that the creation of surplus is observable independently of its distribution, allowing us to verify that a peace dividend exists even where it fails to produce development.

Second, we contribute to literature on the political economy of autocracies and weak democracies (e.g., Shleifer and Vishny, 1993; Shleifer and Treisman, 2005; Olken, 2007; Acemoglu and Robinson, 2008; North et al., 2009; Burgess et al., 2015; Bühler and Madestam, 2026; Egorov and Sonin, 2024). Existing scholarship has characterized how weak institutions allow elites to persist in power and distort economic outcomes for private gain (e.g., Andersen et al., 2022; Martinez-Bravo et al., 2022). We contribute a complementary mechanism: an objectively beneficial development policy, landmine clearance, serves as the very instrument that *enables* elite capture when accountability is absent. By identifying the specific role of local checks and balances in curbing this capture, we provide micro-level evidence on how accountability shapes the distribution of developmental rents in autocratic settings.

Finally, we relate 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). 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 in a post-conflict setting triggers *new* extractive concessions. Accountability determines whether this newly available 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.

The remainder of the paper proceeds as follows. Section 2 presents the conceptual

framework. Section 3 provides context on Cambodia's history of conflict, the resulting institutions, and the landmine clearance campaign. Section 4 introduces our data. Section 5 describes the empirical strategy. Section 6 presents the main results. Section 7 examines mechanisms. Section 8 concludes.

2 Conceptual Framework

The end of armed conflict creates economic potential. Capital that was destroyed or inaccessible can in principle be restored, constituting a latent "peace dividend" (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 relapse into violence despite unrealized potential (Collier et al., 2003). Whether the dividend materializes, and for whom, is not guaranteed.

We argue that a key reason is the accountability of political elites. The end of conflict generates a peace dividend, but its consequences depend on who controls the newly available resources. Where elites face checks and balances, surplus tends to flow toward broad-based economic opportunities. Where accountability is absent, the same surplus is vulnerable to capture, extraction, and ultimately stagnation. This logic yields three predictions. First, the removal of a physical barrier to production creates surplus regardless of accountability. Second, this surplus translates into development only where political elites face checks and balances. Third, where accountability is absent, the same surplus enables capture and conflict over newly valuable resources.

Figure 1 illustrates this logic. The framework also highlights why studying average effects of post-conflict policies can provide an incomplete picture. A null average effect may mask

a dividend that was created but diverted. Testing whether accountability matters 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 accountability specifically? Cambodia's post-conflict environment is one in which 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, a de facto constraint on political elites even where de jure checks and balances are weak (Acemoglu and Robinson, 2008). The next section describes how this logic plays out in our empirical setting.

3 Background

3.1 Decades of Conflict

Cambodia has lived in the shadow of conflict for decades. Civil war culminated in the rise of the Khmer Rouge, who between 1975 and 1979 committed one of history's most egregious genocides (Lenhart et al., 2025; Chandler, 2018; Bühler and Madestam, 2026). The regime abolished private property, destroyed all land titles and cadastral records, and dismantled social trust through a system of surveillance and repression (Chandler, 2018; Yimsut, 2011; Bennett, 2015).

In 1979, 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, rather than to prevent economic development (Roberts, 2011), making Cambodia one of the most mined countries in the

world. By 1991, the insurgency had largely subsided and Cambodia became a UN protectorate (Chandler, 2018).

The end of decades of armed conflict created significant latent economic potential. Vast areas of agricultural land, previously inaccessible due to mines and insecurity, could in principle be restored to productive use.[2] Yet Cambodia today remains one of the poorest and most corrupt countries in Southeast Asia, suggesting that institutional failures prevented the peace dividend from translating into broad-based development. The remainder of this section describes the institutional setting that shaped this process.

3.2 Landmine Clearance and Accountability

Two distinct forces shaped the transformation of post-conflict Cambodia. Landmine clearance, driven top-down by international organizations, removed physical barriers to land use and created local economic potential. Letters of possession, issued bottom-up by village chiefs, established a measure of local accountability over that potential.

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.[3] 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).

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

[2] Because landmines are ubiquitous and cannot be detected without special equipment, the mere suspicion of their presence can make entire swathes of land unusable until they are cleared by professional staff.

[3] See Appendix A for details on the organizations involved and the institutional evolution of clearance prioritization.

economic potential or political affiliation.[4] The timing and scale of operations were further shaped by international donor funding cycles and, in border regions, by diplomatic tensions with Thailand that restricted access to heavily mined areas (Lekfuangfu, 2022). 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.

Letters of possession. A parallel process of institutional development emerged from below. The Khmer Rouge had destroyed all land titles and cadastral records. An estimated quarter of the population perished during the genocide, and virtually all of the remainder were forcibly relocated (Chandler, 2018), making it impossible to establish historical ownership. By the time stability returned in the 1990s, virtually no one in Cambodia could produce formal documentation of land ownership.

In this vacuum, a system of informal land documentation emerged as early as 1989 (Hem, 2019). Village chiefs began issuing "letters of possession" to recognize a household's occupancy of a specific plot. These documents held no formal collateral value and offered no legal enforceability in courts. Under Cambodian law, only land registered with the national cadastral office ("hard titles") can support a mortgage, so letters of possession carried no direct economic significance (Rudi et al., 2014). They were a local governance mechanism rather than a state-sanctioned property right.

The spatial variation in letters of possession was shaped by communities' historical experience under the Khmer Rouge. Where the genocide was most intense, the destruction of social networks and trust created a stronger demand for formal documentation of rights and checks on local authorities (Bühler and Madestam, 2026; Dahis and Mueller, 2019). Because

[4] The National Mine Action Strategy 2010–2019 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, and required operators to deploy 75% of assets to CMAA-designated priority communes.

letters of possession held no collateral value, this demand was unlikely to reflect differences in land values or economic potential. Even formal land titles in Cambodia had weak effects on agricultural productivity and credit access (Markussen, 2008; Biddulph, 2014), and areas with high land values were in some cases excluded from titling rather than prioritized.[5] Letters of possession thus reflect a pre-determined demand for political accountability, rooted in historical experience rather than contemporary economic conditions.

Beyond documenting occupancy, letters of possession represented a concrete form of local accountability. By establishing a record of land use signed by local officials, these documents made it harder to seize occupied territory without consequence. They provided a paper trail visible to international monitors, raising the cost of expropriation in communes where they were prevalent.[6]

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).[7] The 2001 Land Law exemplifies how this concentration of power shaped post-conflict land governance (Diepart and Schoenberger, 2016).

The law nullified all property claims predating 1979, granted the state authority over land identified as unused, and established the legal framework for Economic Land Concessions (ELCs), through which the government contracted state land to private companies for agricultural exploitation (National Assembly of Cambodia, 2001). ELCs are large-scale, long-term

[5] See Open Development Cambodia, "Land Tenure and Titling," available at https://opendevelopmentcambodia.net/topics/land-tenure-and-titling/.

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

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

leases allocated through opaque processes to politically connected actors, widely associated with deforestation and displacement (Diepart, 2015; Pauly et al., 2022; Wang et al., 2023). Appendix A provides additional details on Cambodian land law and concessions.

These provisions link directly to landmine clearance. Landmines prevented continuous cultivation, and the law classified land not in continuous use as state property. Clearance therefore made newly accessible land legally vulnerable to reclassification as "unused" and subsequent transfer to concessionaires.

3.4 Accountability and Elite Capture

Whether newly cleared land was captured depended on a legal prerequisite. An economic land concession may only be granted on land registered and classified as state private land.[8] Such classification requires that no recognized private claim exists (National Assembly of Cambodia, 2001). Letters of possession, though informal, establish legal possession under the 2001 Land Law, a recognized claim that blocks reclassification as state property (Hem, 2019).[9]

Documentation does not make capture impossible, but it raises the cost. The Boeung Kak Lake case illustrates this well. 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: the World Bank suspended all new lending to Cambodia until the dispute was resolved, and the government ultimately issued titles to 800 affected families.[10] Where no

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

[9] Article 30 of the 2001 Land Law recognizes legal possession as a right *in rem*, granting possessors rights similar to those of an owner. See also Appendix A for details.

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

documentation exists, no such friction arises. Land moves from "unused" to "concession" without obstacle.

This legal framework generates a testable prediction: clearance should increase economic land concessions and resource extraction where letters of possession are absent, and have no such effect where they are prevalent. We test this prediction in Section 7, after establishing the main results on development and conflict.

4 Data

We assemble a unique yearly panel dataset covering all 1,621 communes in Cambodia from 1992 to 2010.[11] Table A.3 provides an overview on variable definitions and data sources. Table A.4 shows summary statistics. All data are aggregated to the commune-year level for our analysis, unless indicated otherwise.

4.1 Main Treatment Variables

Our identification strategy exploits the interaction between two sources of variation: top-down landmine clearance, which generates local 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).[12] The

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

[12] The data were obtained from the Open Development Cambodia website but are no longer available there.

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.[13] Around 44% of communes experience neither casualties nor clearances. Of the remainder, 57% are fully cleared by 2010, leaving 26% of all communes yet to be cleared.[14]

Accountability. Our main proxy for local accountability is the share of farming households in each commune with letters of possession issued before 2002. As described in Section 3.2, these documents were issued bottom-up by village chiefs and reflect a pre-determined demand for checks and balances on political elites rather than economic conditions. Although clearance began in the early 1990s, the system of letters of possession emerged independently, as early as 1989, driven by communities' historical experience under the Khmer Rouge rather than by clearance activity (Section 3.2). We calculate this share using the National Census of Agriculture 2013 and classify a commune as having high accountability if the share exceeds 33%, roughly the top decile of the distribution.[15] In robustness checks, we consider alternative cutoffs. Figure 3 illustrates the variation in local accountability across space in our sample.

Alternative accountability proxy. We complement this measure with an alternative proxy for local accountability derived from Bühler and Madestam (2026). This proxy has two properties that make it valuable for our analysis: it correlates strongly with the prevalence of letters of possession, and its variation is unrelated to contemporary economic conditions.

[13] 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.

[14] 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).

[15] 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, most pre-2002 letters were likely issued before or around the time clearance operations began.

The measure is based on transient local productivity shocks during the Khmer Rouge period (1975–1979) that led the regime to target certain communes with more coercive policies, generating higher demand for accountability after the regime's fall. Favorable rainfall raised local rice productivity, which under the Khmer Rouge's forced labor system led to larger concentrations of workers and more deaths. The resulting collective memory of repression sustains demand for political accountability in affected communes today. Because this variation is driven by transient rainfall shocks, which Bühler and Madestam (2026) show are unrelated to contemporary economic conditions, it provides a plausible source of exogenous variation in local accountability. As shown in Table A.5, this measure is a strong predictor of the prevalence of letters of possession, consistent with both measures capturing similar underlying variation in local checks and balances on political elites.

4.2 Main Outcomes

Victimization. Victimization data serve a specific role in our analysis: a reduction in casualties upon clearance provides evidence that clearance generates surplus, independently of whether that surplus translates into development. We obtain data on landmine casualties from the Office for the Coordination of Humanitarian Affairs (OCHA), covering all incidents between 1979 and 2013.[16] The data allow disaggregation by occupation, device type, and casualty type.[17] Communes absent from the data in a given year are assumed to have experienced no casualties. During the sample period, 27,222 casualties were recorded, with the average commune experiencing 6.1 casualties per year. Figure 4 summarizes victims by occupation: the majority are farmers and school children, illustrating the severe disruption

[16] 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/.

[17] UXOs are referred to as explosive remnants of war, or ERWs, in the original data. The data only collect information on casualty type (occupation) until 2005.

to agricultural activity and human capital accumulation.

Local economic development. We use nighttime light intensity as our main proxy for local economic activity, following Chiovelli et al. (2025).[18][19] Time-varying data on economic activity are not available at the commune level from administrative sources. We obtain satellite imagery from the temporally consistent version of the Defense Meteorological Satellite Program (DMSP) created by Li et al. (2020), which adjusts for known issues such as sensor calibration and blooming (Gibson et al., 2021).[20] Our main outcome is an indicator for whether a commune has any nightlights in a given year.[21] Following Chiovelli et al. (2025), this binary measure captures extensive margin effects, which are more relevant in our context: only 5.7% of communes have any nightlights in 1992 and 23.4% in 2010. As intensive margin measures we use log nightlight intensity and a winsorized version that removes extreme values to account for blooming.

Land disputes. We collect data on land disputes from The NGO Forum on Cambodia.[22] 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.1 shows their locations across Cambodia.

[18] 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.

[19] Luminosity is a standard measure of economic activity in the development economics literature. See Gibson et al. (2020) or Gibson et al. (2021) for an overview.

[20] The DMSP series is accessible through https://doi.org/10.6084/m9.figshare.9828827.v2.

[21] The DMSP data report nighttime light intensity on a scale from 0 to 63. We calculate the average luminosity for each commune and year. A commune has nightlights (or is 'lit') if the mean luminosity is above 1, as backlight reflections can lead to non-zero luminosity values in low-light rural areas (Chiovelli et al., 2025)

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

4.3 Mechanisms

We collect several additional variables to examine the channels through which accountability may shape post-clearance outcomes, as suggested by the conceptual framework in Figure 1.

Economic Land Concessions. 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).[23] The data list all ELCs granted between 1994 and 2010, with information on date, location, product type, and ownership. We construct an indicator for whether an ELC was established in a given commune-year. 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.2 maps their locations.

Resource extraction. 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.[24] The data are aggregated at the commune level and are available from 2000 to 2010.

Household economic outcomes. 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.

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

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

4.4 Control Variables

We collect a rich set of variables on pre-existing commune characteristics, including latitude, longitude, their interaction, US bombing loads, distance to the nearest road, distance to the provincial capital, pre-Khmer Rouge population, and soil fertility. These variables are described in Table A.3, with corresponding summary statistics in Table A.4.

5 Empirical Strategy

5.1 Identification

Our main question is whether checks and balances on political elites promote post-conflict recovery. Testing this is challenging because the peace dividend is latent, 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 roll-out of Cambodia's landmine clearance campaign provides commune-level shocks to surplus over space and time. We disaggregate these shocks by the strength of pre-existing local accountability to test whether surplus translates into development only where political elites face checks and balances.

We implement this strategy using the imputation estimator of Borusyak et al. (2024), following Chiovelli et al. (2025). Standard two-way fixed effects estimators can produce biased estimates 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. Our question is different: we ask whether political accountability determines how the surplus from clearance is allocated. This motivates disaggregating the clearance shock by the strength of pre-existing local accountability:

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

where Y_{ct} is an outcome in commune c in year t, 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, μ_c are commune fixed effects, and $\gamma_p \times \tau_t$ are province-by-year fixed effects that absorb region-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 how the peace dividend is distributed, we expect clearance to increase economic development where political elites face checks and balances ($\delta_1 > 0$) and to have no positive effect, or even negative consequences through elite capture and renewed conflict, where accountability is weak ($\delta_2 \leq 0$).

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 differences in economic potential or geographic characteristics, are accounted for as long as they are time-invariant within communes. All specifications include a rich set of pre-existing commune characteristics interacted with year fixed effects 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 surplus, with no pre-trends or anticipation effects. Second, the timing of clearance must be orthogonal to pre-existing accountability, 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 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. The next subsection validates each of these assumptions before we turn to the main results in Section 6.

5.2 Validating Assumptions

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

Assumption (i): Clearance is a shock to surplus. If landmine clearance constitutes a shock to local surplus, we should observe an immediate reduction in casualties upon clearance, with no differential trends before treatment and no anticipation effects. We cannot directly verify this increase in surplus using realized economic outcomes, precisely because our hypothesis is that the translation of potential into 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.

We test this using the average effect of clearance on victimization:

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

where Y_{ct} measures victimization in commune c in year t, C_{ct} indicates completed clearance,

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. Table 1 reports the results. Clearance reduces the number of civilian victims by 0.273 per commune-year ($p < 0.01$), a decline of 26% relative to the pre-treatment mean in communes with minefields (Column 4). The probability of any civilian casualty falls by 2.3 percentage points ($p < 0.01$), or 13% of the pre-treatment mean (Column 2). These effects are robust to the inclusion of controls. Clearance also significantly reduces the probability of farmer casualties (Columns 5–6), consistent with an increase in agricultural potential. As shown in Figure 4, the majority of landmine victims are farmers and school children, suggesting that clearance expands both agricultural capacity and human capital accumulation.

Figure 5 traces out the dynamic treatment effects and anticipation placebos. The event-study coefficients are flat before clearance, ruling out differential pre-trends and anticipation effects, and decline sharply upon treatment. We further verify that clearance timing is unrelated to pre-existing economic conditions. Figure 6 regresses indicators for clearance timing on economic outcomes measured in 1992 and shows no systematic association, supporting the assumption that clearance timing is not driven by economic or political factors. Additional robustness checks, including controlling for market access, aggregating outcomes to the district level, and replacing province-by-year with district-by-year fixed effects, are presented in Table A.6 and Table A.7.

Assumption (ii): Clearance is orthogonal to pre-existing accountability. We provide three pieces of evidence that the timing of clearance does not depend on local accountability. First, as described in Section 3.2, clearance was planned top-down by international organizations on the basis of casualty rates and contamination density, with no criteria related to local political conditions, while letters of possession emerged bottom-up from communities' his-

torical experiences under the Khmer Rouge. These two sources of variation were determined at different administrative levels by different actors, implying that they should be independent of one another.

Second, Figure 3 maps the locations of minefields alongside communes with high accountability. The spatial distributions show no systematic overlap.

Third, Table 2 tests this directly by regressing 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. 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.

Assumption (iii): Returns to clearance are orthogonal to potential correlates of pre-existing accountability. The remaining concern is that accountability may correlate with other commune characteristics, such as population density or geographic features, that 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 the surplus generated by clearance differs across high- and low-accountability communes. If accountability determines the *distribution* of surplus rather than its *creation*, as our conceptual framework predicts, clearance should reduce victimization regardless of accountability. Table 3 confirms this. Clearance significantly reduces civilian casualties in both high-accountability communes

(-0.040, $p < 0.01$) and low-accountability communes (-0.021, $p < 0.01$), with the difference between the two not statistically significant at conventional levels (Column 2). The same pattern holds for farmer casualties (Columns 6 and 8). Surplus creation does not depend on accountability. We predict that accountability determines only whether this surplus translates into realized economic development or elite capture, consistent with the conceptual framework in Figure 1. Figure A.3 further confirms that there are no differential pre-trends in victimization for high- and low-accountability communes separately, ruling out that accountability-specific trends could confound the heterogeneous results.

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, they should not replicate with this alternative measure.[25] We present the corresponding reduced-form results alongside our main findings in the next section.

Third, we show in robustness tests that clearance has no differential effects on our main outcomes when we replace accountability with placebo splits on pre-existing commune characteristics, such as population, road access, or soil fertility. We present these results, along with further robustness checks, after the main results in the next section.

6 Results

Having established that clearance generates surplus regardless of accountability, we now turn to the central question: does accountability determine how this surplus is allocated?

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

6.1 Development

Table 4 reports estimates of equation (1) with nightlights as the outcome. Clearance significantly increases economic activity in high-accountability communes but has no effect where accountability is weak. In the preferred specification with controls (Column 2), clearance raises the probability that a commune has any nightlights by 4.1 percentage points ($\hat{\delta}_1 = 0.041$, $p < 0.01$). The effect on winsorized log nightlights is similarly large and significant ($\hat{\delta}_1 = 0.466$, $p < 0.01$, Column 6). In contrast, the corresponding estimates for low-accountability communes are small and statistically indistinguishable from zero across all specifications ($\hat{\delta}_2 = 0.007$ for any nightlights, Column 2). The difference between high- and low-accountability communes is statistically significant ($p = 0.025$ for any nightlights; $p = 0.007$ for winsorized log nightlights). Relative to the pre-treatment mean of 0.061, the 4.1 percentage point effect implies a 67% increase in the probability of any nightlights. This large relative magnitude reflects the low base rate. Most communes with minefields had no detectable nightlights before clearance, so even modest absolute changes translate into large relative effects on the extensive margin. 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 of approximately 6%.

These results confirm a key prediction of the conceptual framework: when political elites face checks and balances, the surplus unlocked by clearance translates into broad-based economic development. When accountability is absent, the same surplus yields no detectable improvement in local economic activity.[26]

Importantly, this finding replicates when we replace letters of possession with the alterna-

[26] Consistent with this, the average effect of clearance on nightlights across all communes is small and statistically insignificant (Table A.8), as are the corresponding event-study estimates (Figure A.4). The absence of an average development effect is unsurprising given Cambodia's overall weak institutional environment, in which the majority of communes have low accountability.

tive accountability proxy based on transient Khmer Rouge productivity shocks (Table A.1). Because this variation is driven by historical weather shocks unrelated to contemporary economic conditions, the replication is inconsistent with the possibility that our findings reflect heterogeneous returns to land quality rather than the role of accountability. We report these results in detail in Appendix C.

6.2 Renewed Conflict

Table 5 reports estimates of equation (1) with land disputes as the outcome. Clearance significantly increases land disputes in low-accountability communes but has no effect where accountability is strong. In the preferred specification with controls (Column 2), clearance raises the probability of any ongoing land dispute by 2.2 percentage points in low-accountability communes ($\hat{\delta}_2 = 0.022$, $p < 0.05$). The effect on the number of disputes is similarly significant ($\hat{\delta}_2 = 0.024$, $p < 0.05$, Column 4). Relative to the pre-treatment mean of 0.018, the 2.2 percentage point effect implies a large relative increase. As with nightlights, this reflects the low base rate of disputes rather than an implausibly large absolute effect. In contrast, clearance has no effect on disputes in high-accountability communes ($\hat{\delta}_1 = -0.003$ for any dispute, Column 2). The difference between high- and low-accountability communes is significant at the 10% level for the number of disputes ($p = 0.078$, Column 4).

These results are consistent with the nightlights results. Where political elites face checks and balances, clearance generates economic development without conflict. Where accountability is absent, the surplus triggers disputes over land rather than productive investment.

The same pattern holds with the alternative accountability proxy based on Khmer Rouge productivity shocks (Table A.2), further ruling out the possibility that the divergence reflects pre-existing economic differences rather than accountability (see Appendix C).

6.3 Robustness

We subject our main findings to a battery of additional robustness checks. Section 5.2 established the core identification assumptions. Here we address remaining concerns about pre-trends, the definition of accountability, potential confounders, and specification choices.

Pre-trends by accountability. Our identification requires that high- and low-accountability communes do not follow differential trends in outcomes prior to clearance. In Section 5.2, we showed that the average effect of clearance on victimization exhibits no pre-trends, and that this holds separately for high- and low-accountability communes (Figure A.3). Figure A.5 extends this test to nightlights. The event-study coefficients are flat before clearance in both high- and low-accountability communes, ruling out that the divergence in post-clearance nightlights is driven by pre-existing differential trends.

Correlates of accountability. A remaining concern is that accountability correlates with commune characteristics whose time trends independently shape the returns to clearance. 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, and soil fertility. As shown in Table A.9, none of these placebo splits produce a statistically significant difference in the effect of clearance on nightlights or land disputes, confirming that the heterogeneity we document is specific to accountability rather than a generic feature of commune characteristics.

Alternative accountability cutoffs. Our main specification defines high accountability as a commune having a share of farmers with letters of possession that exceeds 33%. Figure A.6 shows that the results are not sensitive to this threshold. We re-estimate equation (1) using the 25th, 50th, 75th, and 90th percentile of the distribution as alternative cutoffs. The

coefficients on nightlights and land disputes maintain the same sign and pattern across cutoffs, confirming that the divergence between high- and low-accountability communes is not an artifact of a particular definition. Moreover, our results are robust to using a continuous measure of accountability, the share of farmers with letters of possession, instead of a binary one (Table A.10 and Table A.11). Finally, we replace our main accountability measure with an alternative based on the share of agricultural *landholdings* covered by letters of possession, rather than the share of farmers. The results on nightlights and land disputes replicate with this alternative measure (Table A.15 and Table A.16).

Specification checks. Table A.12 and Table A.13 report results from five alternative specifications: (i) controlling for log market access, constructed following Chiovelli et al. (2025) as detailed in Appendix B, to rule out that clearance improves development through trade linkages rather than local production; (ii) aggregating outcomes to the district level to account for potential spillovers, including local market access effects; (iii) replacing province-by-year with district-by-year fixed effects to allow for more granular differential trends; (iv) including accountability-by-year fixed effects to absorb time-varying shocks common to communes with similar accountability levels; and (v) dropping communes in the top 10% of clearance duration.

Across all five specifications, the core findings hold. For nightlights, the effect of clearance in high-accountability communes remains positive and statistically significant at the 10% level or better in all five specifications ($\hat{\delta}_1$ ranges from 0.015 to 0.045), while the effect in low-accountability communes remains small and generally statistically insignificant (Table A.12). For land disputes, the effect of clearance in low-accountability communes remains positive and significant at the 10% level or better across all specifications ($\hat{\delta}_2$ ranges from 0.010 to 0.024), while the effect in high-accountability communes is consistently null

(Table A.13).[27]

7 Mechanisms

The results in Section 6 establish that clearance generates surplus regardless of accountability but raises economic activity only in high-accountability communes and land disputes only in low-accountability communes. These findings are consistent with the conceptual framework in Figure 1, but they do not identify the channel through which the divergence operates. In this section, we trace the divergence to a specific 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 of local households. We test each link in this chain using data on ELCs, forest cover, and household economic outcomes from the Cambodia Socio-Economic Survey (CSES).

7.1 Elite Capture and Resource Extraction

The institutional setting described in Section 3.3 generates a direct prediction. Cambodian land law reclassifies land not in continuous use as state property and establishes the legal framework for ELCs. Because landmines prevented cultivation, clearance made newly accessible land legally vulnerable to reclassification as "unused" and subsequent transfer to politically connected concessionaires. In communes where letters of possession documented prior land use, this reclassification was more costly. We therefore expect clearance to increase ELCs where accountability is weak and to have little effect where it is strong. Descriptive evidence supports this prediction: Figure A.7 shows that ELCs are the leading reason for land seizure in disputes, motivating our focus on concessions as the primary channel.

[27] The average effect of clearance on nightlights noted in Section 6.1 remains small across all five specifications and is statistically insignificant in four of the five (Table A.14).

Table 6 reports estimates of equation (1) with ELCs as the outcome. In low-accountability communes, clearance increases 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. In high-accountability communes, the corresponding estimate is small and statistically insignificant ($\hat{\delta}_1 = 0.018$, Column 2). 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 6 test this. 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 no gains in nightlights suggests that concessions extract resources rather than develop them.

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.

Table 7 reports estimates of equation (1) with hours worked and household consumption as outcomes. In low-accountability communes, clearance reduces hours worked by 2.8 hours 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). In high-accountability communes, clearance has no significant effect on hours worked ($\hat{\delta}_1 = -0.715$, Column 2). The decline in hours is

consistent with displacement from captured land. 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 consequences of capture.

The pattern reverses for consumption. 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 6% level ($p = 0.054$). Where accountability constrains elite behavior, households benefit directly from the surplus unlocked by clearance. Where it does not, the same surplus generates no welfare gains for the local population.

Taken together, the mechanism evidence traces a consistent chain from clearance to outcomes. In low-accountability communes, clearance triggers ELCs, ELCs extract resources through deforestation, and households are displaced. 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. We note that the mechanism evidence is correlational within the research design. Our identification strategy isolates the moderating role of accountability, not the ELC channel per se. ELCs are the most visible margin of capture, but other channels may also contribute.

8 Conclusion

Does political accountability determine whether post-conflict economies recover or stagnate? We study this question in the context of Cambodia's landmine clearance campaign, exploiting the interaction between the timing of clearance and pre-existing variation in local 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. But the translation of this surplus into development depends on accountability. In communes where political elites face checks and balances, clearance raises nightlights and household consumption. In communes where accountability is weak, the same surplus triggers land disputes and delivers no economic gains for the local population. We trace this divergence to elite capture: clearance in low-accountability communes leads to a large increase in Economic Land Concessions, deforestation, and reduced hours worked, while none of these effects appear where accountability is strong.

These findings carry three implications. First, they demonstrate that 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 show that this prediction holds only where institutions constrain elite behavior. Without accountability, the peace dividend is created but diverted.

Second, objectively beneficial development policies can enable elite capture. Landmine clearance made previously inaccessible land available, but this very availability created opportunities for expropriation. This suggests that post-conflict reconstruction programs should be designed with attention to the political economy of resource allocation, not just economic considerations.

Third, these findings are directly relevant to contemporary reconstruction efforts, most notably in Ukraine, now the most heavily mined country in the world. Our evidence warns that successful clearance alone will not guarantee inclusive recovery where conditions for elite capture are present. Coupling reconstruction with institutional reforms that strengthen local accountability may be essential for the peace dividend to reach the population.

Several questions remain open. We show that accountability shapes whether one spe-

cific peace dividend, the expansion of usable land, translates into development. Whether accountability plays a similar role for other forms of post-conflict surplus, such as aid flows, infrastructure investment, or natural resource revenues, is an important question for future work. So is whether the elite capture we document is reversible: if institutions improve after concessions are granted, can the consequences be undone? Finally, our setting identifies the role of accountability but not its optimal design. Which specific institutional features, whether formal property rights, electoral competition, or civil society oversight, are most effective at constraining capture in post-conflict environments remains to be studied.

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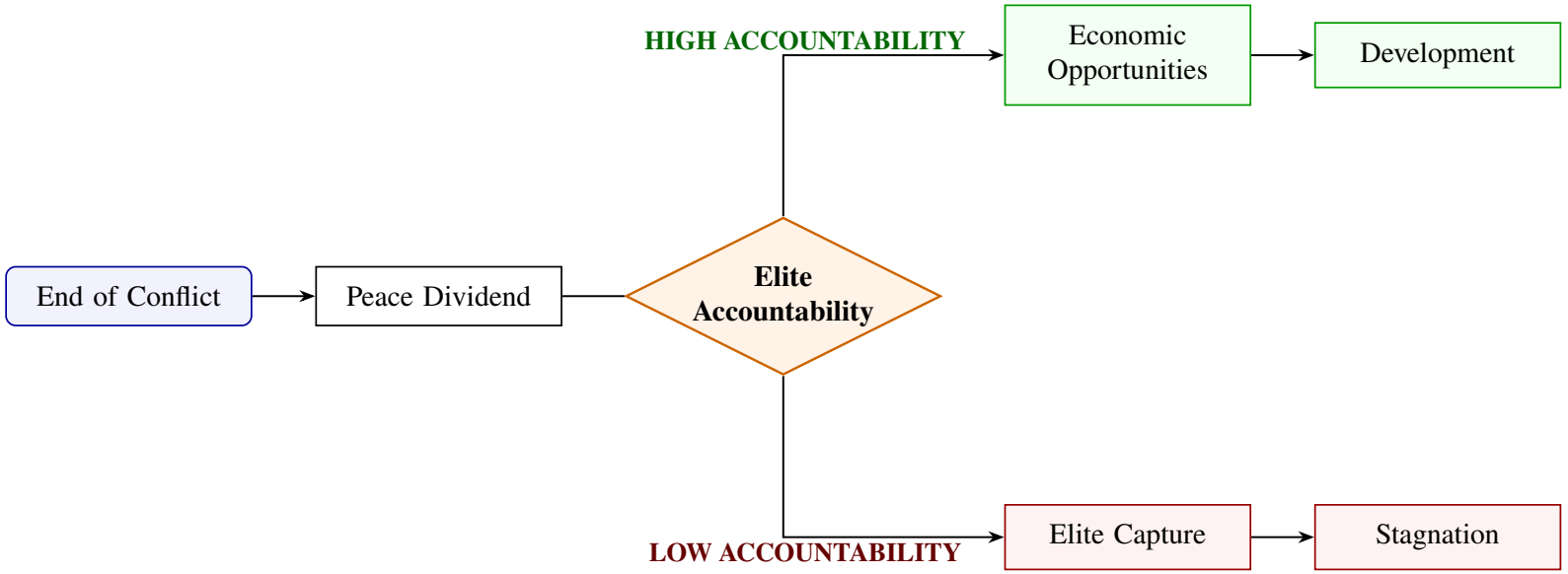
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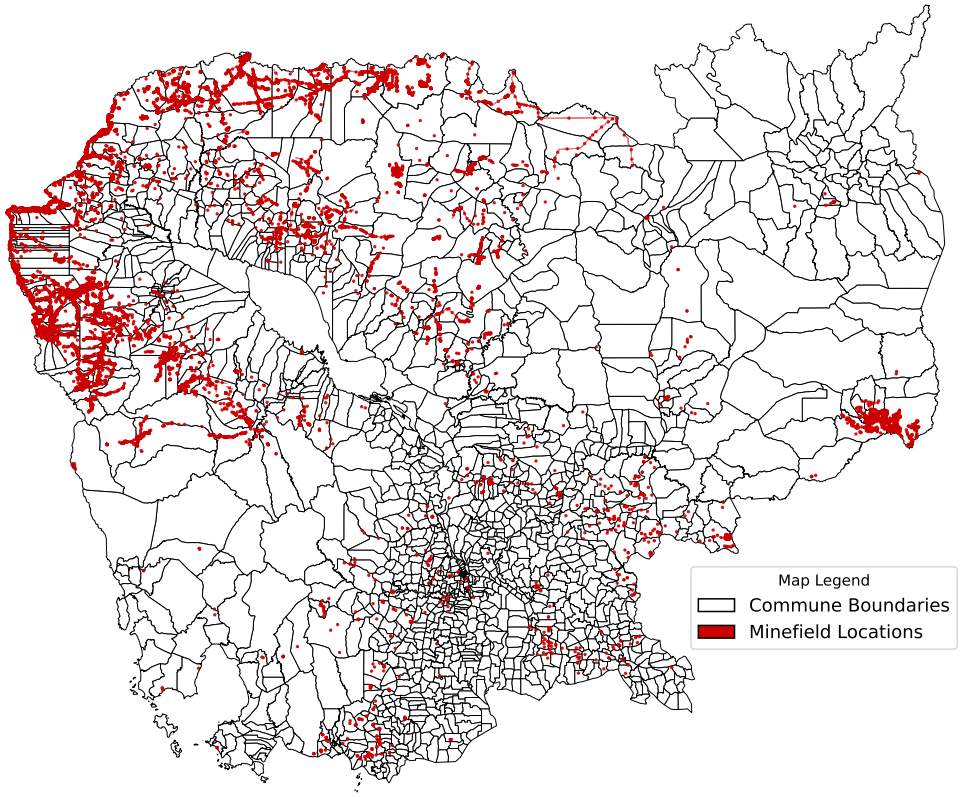
Figures

Figure 1: Theory of Change: Post-Conflict Recovery



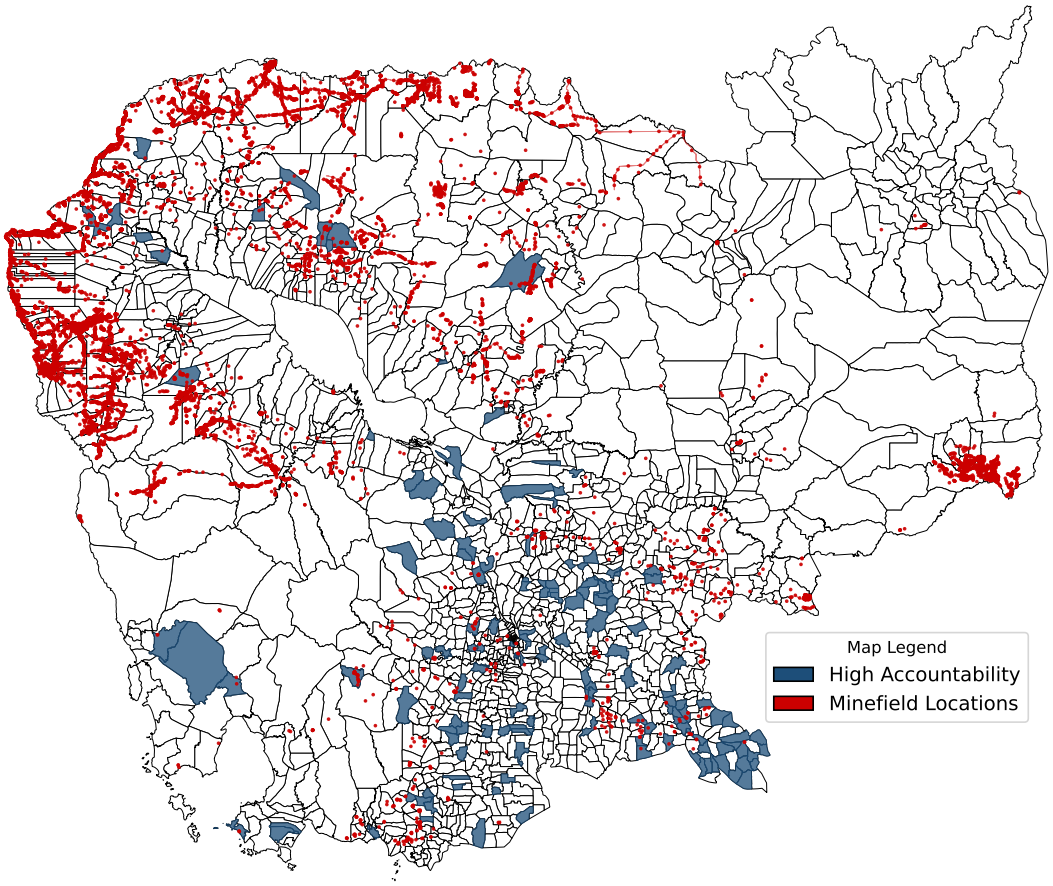
Notes: This figure summarizes the conceptual framework. Landmine clearance generates a peace dividend. In high-accountability communes, where political elites face checks and balances, the surplus translates into economic development. In low-accountability communes, elites capture the surplus through mechanisms such as Economic Land Concessions, leading to land disputes rather than development.

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



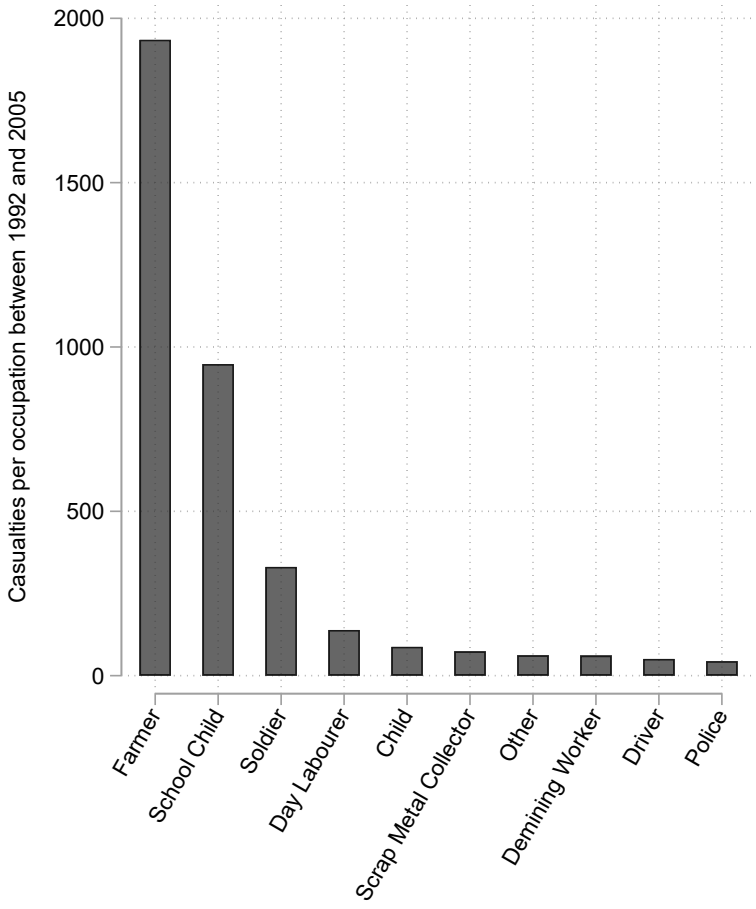
Notes: The map shows the locations of cleared minefields (in red) in our sample, including all clearances completed by 2010. Data on clearance locations are from NGOs coordinating mine clearance efforts in Cambodia (CMAC and The Halo Trust). The thinner black lines indicate commune borders while the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

Figure 3: Minefields and Communes with Existing Letters of Possession



Notes: This map shows minefield centroids and commune borders. Data on minefields are from NGOs 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 in the highest decile based on data from the 2013 National Agricultural Census, in blue. The vast majority of communes thus classified as 'low accountability' have no farmers with pre-2002 letters of possession.

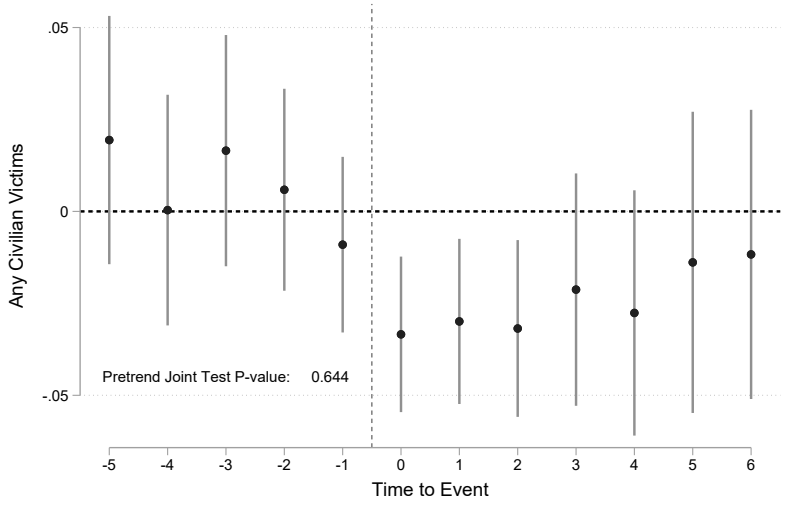
Figure 4: Landmine Casualties



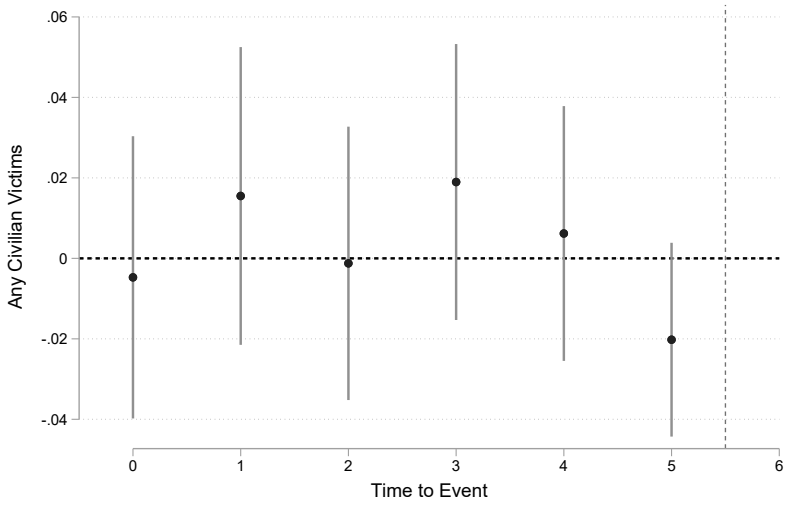
Notes: The figure plots the total number of recorded landmine casualties between 1992 and 2005 disaggregated by the victim's occupation. Data on landmine victims and occupation type are from the Office for the Coordination of Humanitarian Affairs (OCHA). Data by occupation type is only available until 2005 and not for our entire sample period. 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 school children. This highlights the severe risk landmine contamination poses to agricultural labor and human capital accumulation.

Figure 5: Victimization: Dynamic Treatment Effects and Anticipation Placebos

(a) Dynamic Treatment Effects

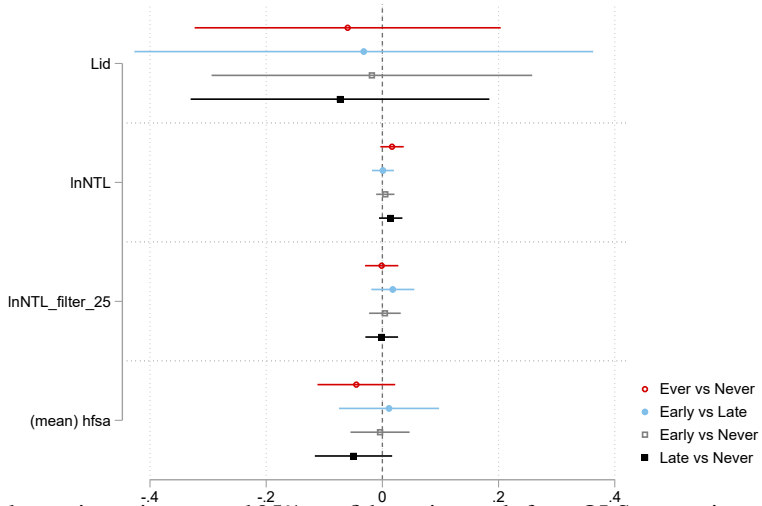


(b) Anticipation Placebos



Notes: The outcome variable is an indicator for any civilian victims in a commune and year. In panel (a), we report the coefficients from an event study estimation of Equation 2, following the DDI approach from Borusyak et al. (2024). In panel (b), we report the coefficients from placebos based on Equation 2, following the anticipation test approach from Borusyak et al. (2024). In this placebo test, we shift the treatment to 6 periods before any mine clearance in a commune. In both specifications, 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 6: Balance Test - 1992 Economic Outcomes and Landmine Clearances



Notes: The 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 outcomes measured in 1992. Confidence intervals spanning zero indicate no significant association at the 5% level.

Tables

Table 1: Average Effects - Victimization

	Any Civilian Victims		Number of Victims: All Civilians		Any Farmer Victims		Number of Victims: Farmers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cleared	-0.032***	-0.023***	-0.303***	-0.273***	-0.010**	-0.009**	-0.020	-0.019
	(0.008)	(0.007)	(0.058)	(0.055)	(0.004)	(0.004)	(0.013)	(0.013)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓		✓
Observations	28,167	28,167	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	1,614	1,614
Pre-Treatment Mean	0.171	0.171	1.031	1.031	0.063	0.063	0.193	0.193

Notes: This table reports the δ estimates from Equation 2 for the effect of completed minefield clearances on victimization. The measures here are an indicator for any civilian victim within a commune and year, the number of civilian victims, an indicator for any victims that are farmers, and the number of farmers who are victims. 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. 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 Accountability and Landmine Clearance

	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	-0.012	-1.720	-0.266	-0.201	-0.684	-0.678	-0.066
	(0.036)	(1.333)	(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 in the top decile. An observation is a commune, and we group the outcomes into three groups: 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: Victimization and Accountability

	Any Civilian Victims		Number of Victims: All Civilians		Any Farmer Victims		Number of Victims: Farmers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cleared × High Accountability	-0.038***	-0.040***	-0.117***	-0.151***	-0.016***	-0.017***	-0.023**	-0.027***
	(0.011)	(0.011)	(0.035)	(0.043)	(0.006)	(0.006)	(0.010)	(0.010)
Cleared × Low Accountability	-0.031***	-0.021***	-0.321***	-0.284***	-0.009**	-0.008*	-0.020	-0.018
	(0.008)	(0.008)	(0.063)	(0.059)	(0.005)	(0.005)	(0.014)	(0.014)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓		✓
Observations	28,167	28,167	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	1,614	1,614
Pre-Treatment Mean	0.114	0.114	0.622	0.622	0.032	0.032	0.074	0.074
Difference High and Low Acc	-0.007	-0.018	0.204	0.133	-0.006	-0.009	-0.004	-0.009
p-value	0.571	0.169	0.004	0.049	0.362	0.185	0.828	0.555

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. Accountability is proxied by a commune having a share of farmers with pre-2002 letters of possession in the top decile. 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 4: Economic Development and Accountability

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.044***	0.041***	0.348**	0.311**	0.521***	0.466***
	(0.012)	(0.012)	(0.152)	(0.155)	(0.132)	(0.129)
Cleared × Low Accountability	0.012	0.007	0.068	0.014	0.110	0.064
	(0.010)	(0.010)	(0.089)	(0.092)	(0.092)	(0.091)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.061	0.061	-8.247	-8.247	-8.462	-8.462
Difference High and Low Acc	0.032	0.033	0.280	0.298	0.411	0.402
p-value	0.033	0.025	0.090	0.077	0.007	0.007

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 in the top decile. We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights (a log + 0.0001 transformation is applied to account for zeros), and the log of the winsorized nightlights, which removes extreme values to prevent well-lit areas from affecting nearby areas due to blooming. 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 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 FE		✓		✓		✓
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
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	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 in the top decile. Any Disputes is an indicator for having any on-going dispute in the commune. Disputes captures the cumulative number of on-going land disputes in a commune and year. LN Disputes is ln(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: 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: Elite Capture and Accountability

	ELCs		ELCs - Plantations		Forest Cover	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.014	0.018	0.002	0.008	0.015	0.014
	(0.028)	(0.030)	(0.007)	(0.008)	(0.010)	(0.010)
Cleared × Low Accountability	0.070***	0.070***	0.016*	0.019**	-0.009**	-0.011**
	(0.018)	(0.017)	(0.009)	(0.009)	(0.004)	(0.005)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.044	0.044	0.014	0.014	0.015	0.015
Difference High and Low Acc	-0.057	-0.052	-0.013	-0.011	0.025	0.025
p-value	0.088	0.132	0.229	0.336	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 in the top decile. 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. ELC Plantation Crops is an indicator equal to 1 if an ELC is identified as focused on rubber trees, sugar, palm oil, or pulp and 0 otherwise. 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: 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 7: Employment, Consumption, and Accountability

	Hours worked		LN Hours worked		LN 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 FE		✓		✓		✓
Observations	2,141	2,141	2,141	2,141	1,783	1,783
Clusters	854	854	854	854	789	789
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	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 in the top decile. 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. 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. 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: the landmine clearance process, the role of 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 by "blood data" — the immediate risk of casualties — and the technical accessibility of contaminated sites (Bottomley, 2003). Operators used historical casualty maps to identify hotspots where the threat to life was most acute. Economic potential was rarely a formal criterion. Because these organizations operated largely independently of the Cambodian state and were funded directly by external donors, clearance operations were effectively uncorrelated with local commune-level accountability or lobbying (Horwood, 2000; Maxwell, 2001). There was no formal mechanism for local leaders to petition for clearance, making clearance timing a function of technical survey results rather than community-led demand (Horwood, 2000).

The establishment of the CMAA in 2000 introduced a more structured planning process.

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

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). Under this framework, communities can formally request clearance through Commune Investment Plans (CIP); MAPU technical teams verify the requests and inspect sites; and PMACs, chaired by the Provincial Governor, produce the final annual work plan. While this process introduced a formal bottom-up component, the final decision-making power remained concentrated at the provincial level, with prioritization continuing to be guided primarily by casualty data and contamination density (Geneva International Centre for Humanitarian Demining, 2011). Research indicates that provincial bodies sometimes overrode the priorities set by local communes (Biddulph, 2011; Un, 2006; Diepart, 2015).

A.2 Letters of Possession

As described in Section 3.2, letters of possession provided a paper trail that raised the cost of expropriating land from local populations. A prominent example illustrates this mechanism. After a dispute at Boeung Kak Lake in 2011, the World Bank suspended all new lending to Cambodia. The case involved residents who held valid claims to the land through letters of possession but were denied formal adjudication during a World Bank-funded titling project (LMAP).[29] This case demonstrates that where letters of possession were prevalent, international monitors could use documented land claims as a basis for sanctioning government projects, making expropriation more costly.

[29] See https://www.theguardian.com/global-development/2011/aug/10/world-bank-suspends-cambodia-lending and https://www.worldbank.org/en/news/press-release/2011/03/08/world-bank-board-executive-directors-considers-inspection-panel-report-cambodia-land-management-administration-project.

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). However, it was the 2001 Land Law that introduced sweeping 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 use unused land (Diepart and Schoenberger, 2016). Nevertheless, 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 key issues provide further insight into the link between the 2001 Land Law and land appropriation. First, Cambodia's original land titling system, established in 1989, 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, with bribes often necessary to advance applications. As a result, many low-income farming families were discouraged from participating (Diepart, 2015).[30] Following the 2001 reforms, the World Bank supported a project to improve land titling and property rights, but progress was slow. Critics argued that the reform disproportionately benefited officials and 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

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

companies under ELCs.[31] In practice, these legal instruments have been used to justify the transfer of land to ELCs in areas where formal land entitlements are limited. However, several studies have raised concerns regarding 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.[32]

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 as a means of consolidating political power. Within this framework, land concessions function as instruments of elite control, while land titling for the general population has progressed slowly (Un and So, 2011).

[31] 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.

[32] Examples include logging activities by ELC companies that extended beyond permitted areas (Diepart, 2015), contributing to deforestation (Pauly et al., 2022). This deforestation has been linked to the expansion of rubber plantations (Wang et al., 2023), which are prevalent among Cambodian ELCs (Diepart, 2015).

B Market Access

Approach and settings. 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 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.[33] We build the transport map once and then update it in each year by searching for hazards that have yet to be cleared.

Market Access. 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.

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

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 CMP, we adopt a trade elasticity of 3.8.[34]

Use in our analysis. Chiovelli et al. (2025) show that landmine clearance in Mozambique improved economic development partly through increased market access. Instead, our interest is in the heterogeneous effects of clearance by accountability. Thus, we include log market access as a control in our main specification (equation 1) to ensure that market access improvements do not confound the differential effects we document. The results of this robustness check are reported in Column 1 of Table A.12 (nightlights), Table A.13 (land disputes), and Table A.7 (victimization). Controlling for market access does not change our main findings.

[34] CMP use a value of 3.88, close to the midpoint of estimates in the literature for agricultural economies in developing countries.

C Alternative Accountability Proxy: Khmer Rouge Productivity Shocks

As described in Section 4 and Section 5.2, we verify all main results using an alternative proxy for accountability based on transient productivity shocks during the Khmer Rouge period (Bühler and Madestam, 2026). This section reports the detailed results.[35]

Nightlights. Table A.1 reports the results. The same divergence as in the main specification emerges: in communes with high demand for accountability, clearance raises the probability of any nightlights by 2.3 percentage points in the specification with covariates ($\hat{\delta}_1 = 0.023$, Column 2). Without covariates, the estimate is 2.9 percentage points and significant at the 10% level ($\hat{\delta}_1 = 0.029$, $p < 0.10$, Column 1). The effect on winsorized log nightlights is significant at the 10% level ($\hat{\delta}_1 = 0.228$, $p < 0.10$, Column 6). In contrast, communes with low demand for accountability show no effect ($\hat{\delta}_2 = -0.004$ for any nightlights, Column 2).

Land disputes. Table A.2 reports the results. The pattern is qualitatively consistent: clearance raises the probability of any dispute by 2.4 percentage points in communes with low demand for accountability ($\hat{\delta}_2 = 0.024$, $p < 0.10$, Column 2) and increases the number of disputes significantly ($\hat{\delta}_2 = 0.029$, $p < 0.05$, Column 4). In high-accountability communes, the effect on the number of disputes is smaller and not statistically significant ($\hat{\delta}_1 = 0.015$, Column 4).

Because this variation is based on transient historical weather shocks rather than contemporary economic conditions, the replication of the main results with this alternative proxy is inconsistent with the possibility that our findings reflect heterogeneous returns to land quality

[35] The rows in Table A.1 and Table A.2 are labeled by productivity shocks during the Khmer Rouge. As discussed in Section 5.2, high productivity shocks predict greater repression and thus higher demand for accountability today.

rather than the role of accountability.

Table A.1: Robustness Check: Alternative Proxy for Accountability – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
High Productivity Shocks During KR	0.029*	0.023	0.192*	0.136	0.295**	0.228*
	(0.016)	(0.015)	(0.114)	(0.117)	(0.136)	(0.133)
Low Productivity Shocks During KR	-0.001	-0.004	-0.024	-0.072	-0.027	-0.050
	(0.007)	(0.007)	(0.090)	(0.100)	(0.082)	(0.083)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.061	0.061	-8.257	-8.257	-8.459	-8.459
Difference High and Low Acc	0.030	0.027	0.216	0.208	0.322	0.279
p-value	0.068	0.090	0.087	0.110	0.027	0.049

Notes: This table reports reduced-form estimates from a specification analogous to Equation 1, replacing the letters-of-possession accountability proxy with the Khmer Rouge productivity shock instrument from Bühler and Madestam (2026). The δ_1 row reports the effect of clearance in communes that experienced high productivity shocks during the Khmer Rouge (indicating higher demand for accountability), while δ_2 reports the effect in communes with low productivity shocks. The outcome is nightlights in a commune. 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.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

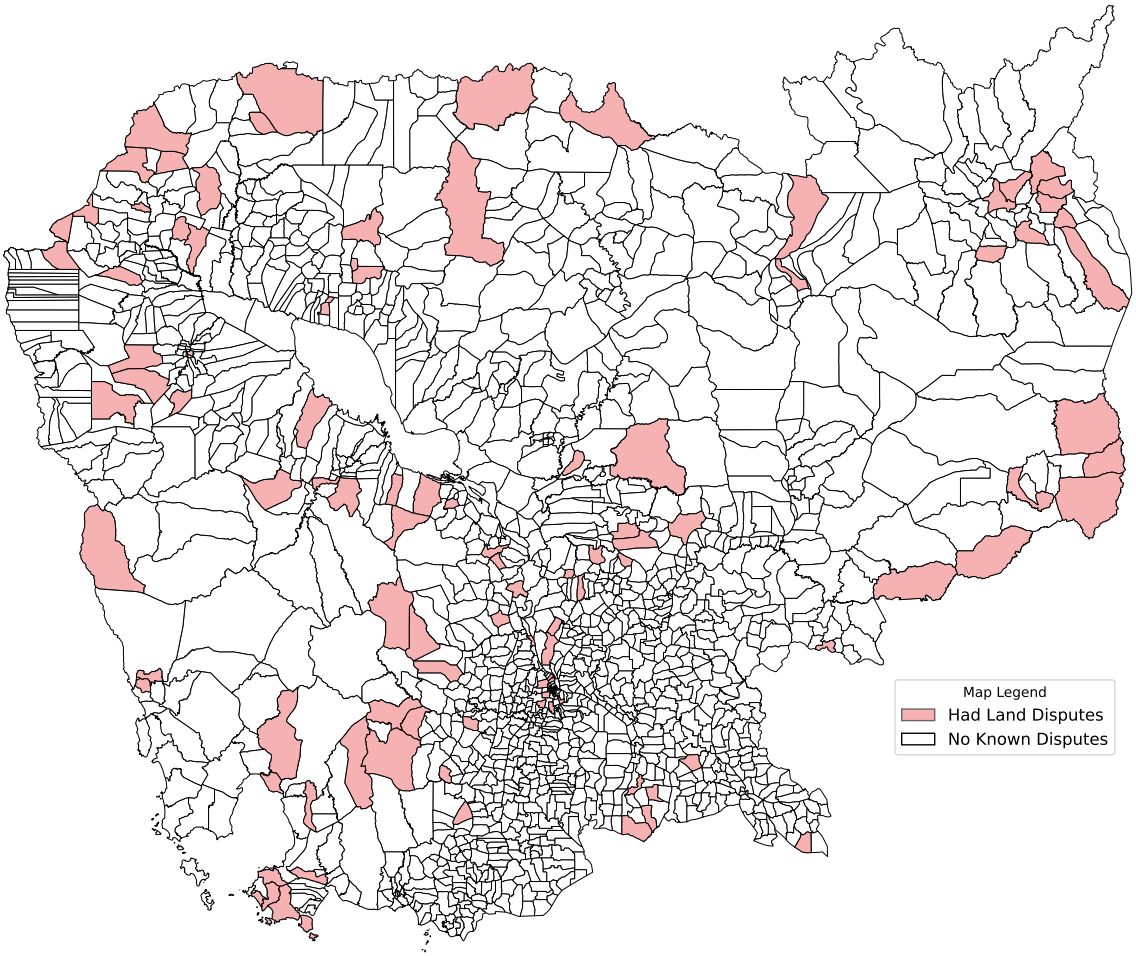
Table A.2: Robustness Check: Alternative Proxy for Accountability – Land Disputes

	Any Dispute		Disputes		LN Disputes	
	(1)	(2)	(3)	(4)	(5)	(6)
High Productivity Shocks During KR	0.016*	0.016*	0.016	0.015	0.011*	0.011
	(0.009)	(0.010)	(0.010)	(0.010)	(0.007)	(0.007)
Low Productivity Shocks During KR	0.023*	0.024*	0.027*	0.029**	0.018*	0.018**
	(0.013)	(0.013)	(0.014)	(0.014)	(0.009)	(0.009)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.011	0.011	0.011	0.011	0.008	0.008
Difference High and Low Acc	-0.007	-0.007	-0.011	-0.014	-0.006	-0.007
p-value	0.645	0.621	0.485	0.405	0.549	0.489

Notes: This table reports reduced-form estimates from a specification analogous to Equation 1, replacing the letters-of-possession accountability proxy with the Khmer Rouge productivity shock instrument from Bühler and Madestam (2026). The δ_1 row reports the effect of clearance in communes that experienced high productivity shocks during the Khmer Rouge (indicating higher demand for accountability), while δ_2 reports the effect in communes with low productivity shocks. The outcome is ongoing land disputes in a commune. 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.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

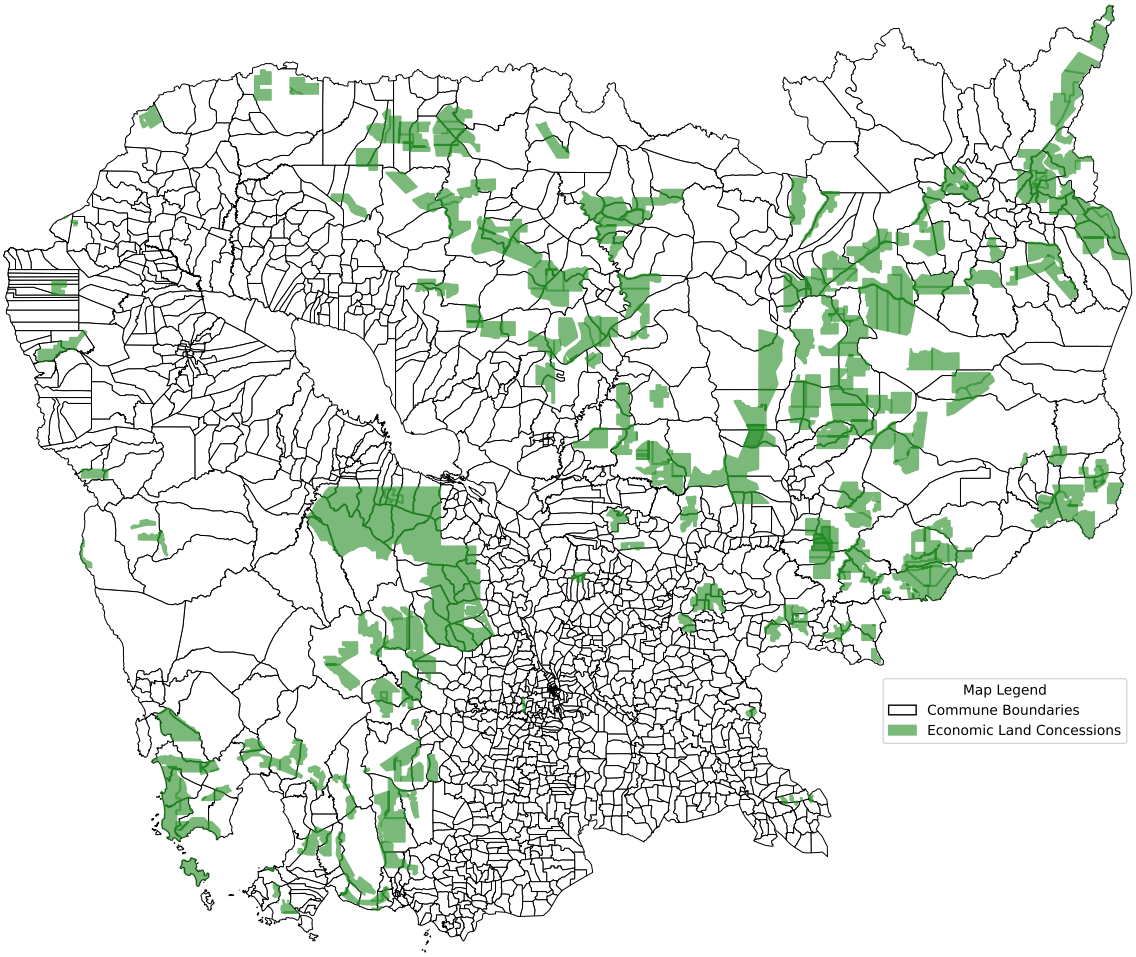
D Appendix Figures

Figure A.1: Communes and Land Disputes



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

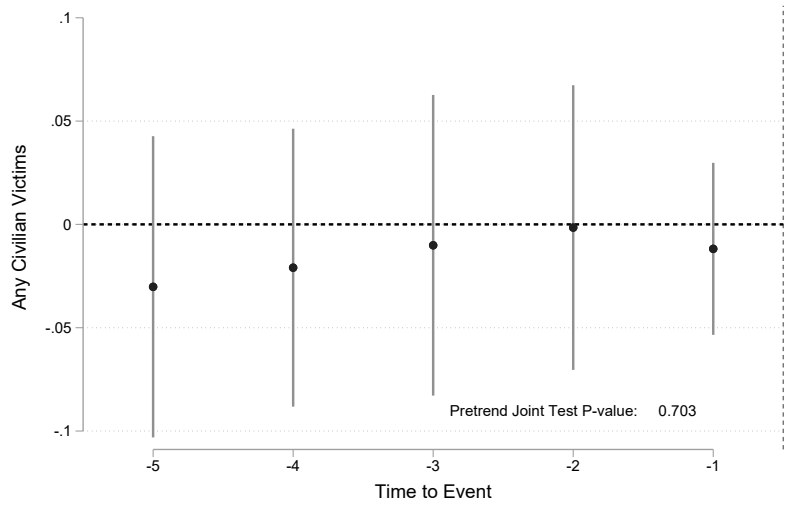
Figure A.2: Communes and ELC Locations



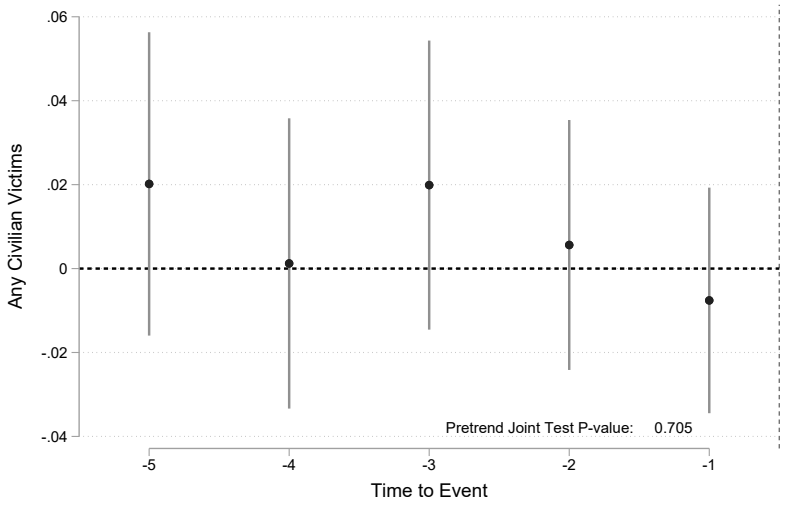
Notes: The map shows commune boundaries and ELC locations. Areas where Economic Land Concessions (ELCs) operate are shaded green. ELC data are from LICADHO and Open Development Cambodia.

Figure A.3: Victimization: Pretrends by Accountability

(a) Pretrends in High Accountability Communes



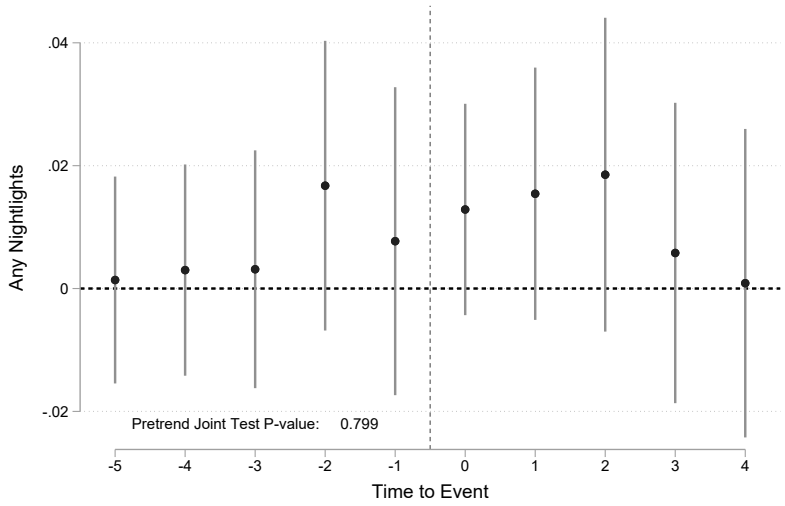
(b) Pretrends in Low Accountability Communes



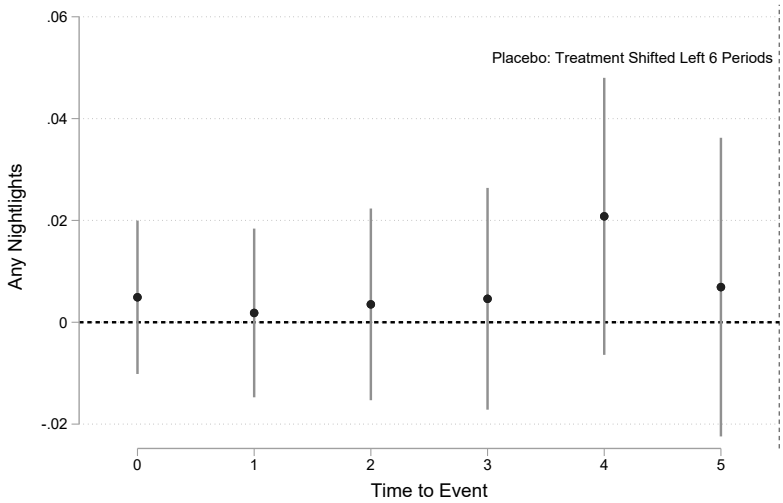
Notes: The outcome variable is an indicator for any civilian victims in a commune and year. In panel (a), we report the pretrend coefficients for the effects of mine clearance among high accountability communes based on specification Equation 2, following the DDI approach from Borusyak et al. (2024). In panel (b), we report the pretrend coefficients for the effects of mine clearance among low accountability communes based on specification 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 not spanning zero indicate significance at the 5% level.

Figure A.4: Any Nightlights: Dynamic Treatment Effects and Anticipation Placebos

(a) Dynamic Treatment Effects



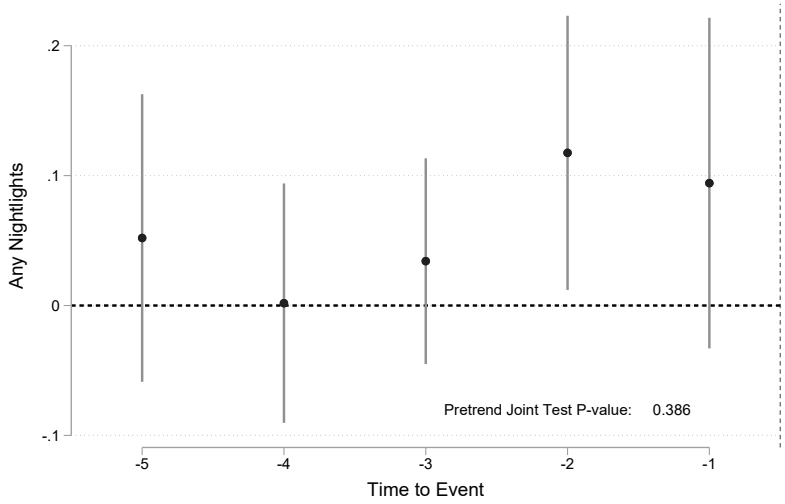
(b) Anticipation Placebos



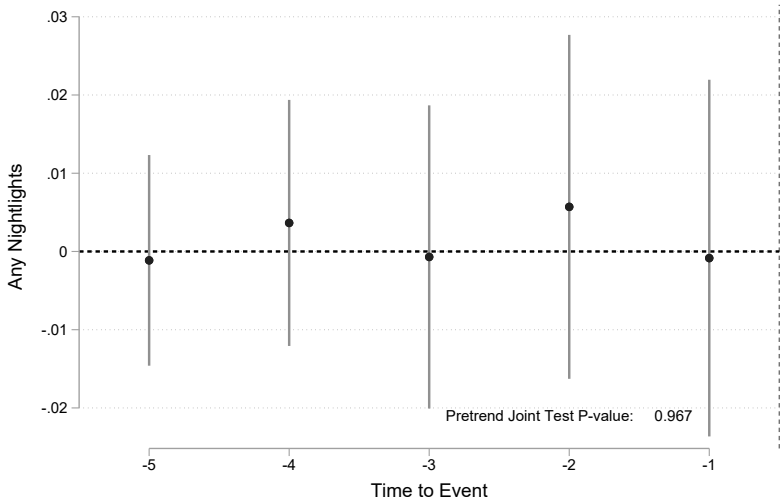
Notes: The outcome variable is an indicator for whether any nightlights are visible in a commune and year. In panel (a), we report the coefficients from an event study estimation of Equation 2, following the DDI approach from Borusyak et al. (2024). In panel (b), we report the coefficients from placebos based on Equation 2, following the anticipation test approach from Borusyak et al. (2024). In this placebo test, we shift the treatment to 6 periods before any mine clearance in a commune. In both specifications, 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.5: Any Nightlights: Pretrends by Accountability

(a) Pretrends in High Accountability Communes



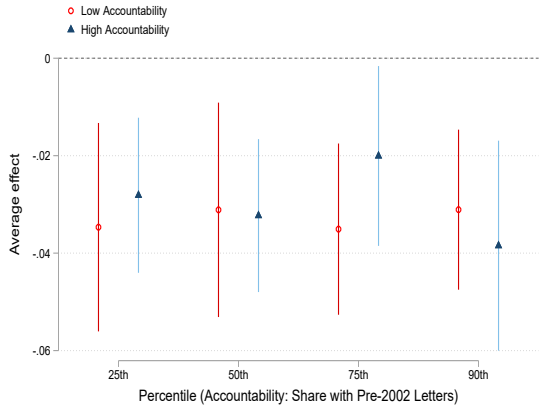
(b) Pretrends in Low Accountability Communes



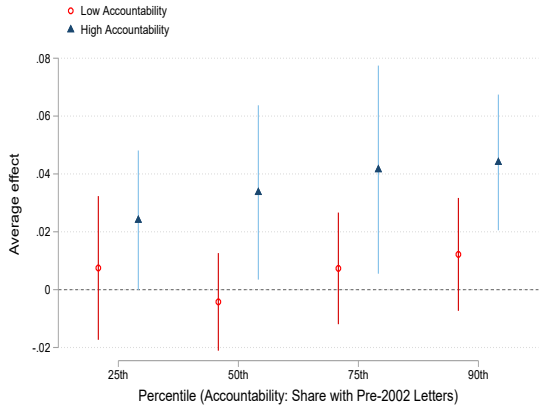
Notes: The outcome variable is an indicator for whether any nightlights are visible in a commune and year. In panel (a), we report the pretrend coefficients for the effects of mine clearance among high accountability communes based on specification Equation 2, following the DDI approach from Borusyak et al. (2024). In panel (b), we report the pretrend coefficients for the effects of mine clearance among low accountability communes based on specification 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 not spanning zero indicate significance at the 5% level.

Figure A.6: Heterogeneity by Accountability - Robustness to Different Cutoffs

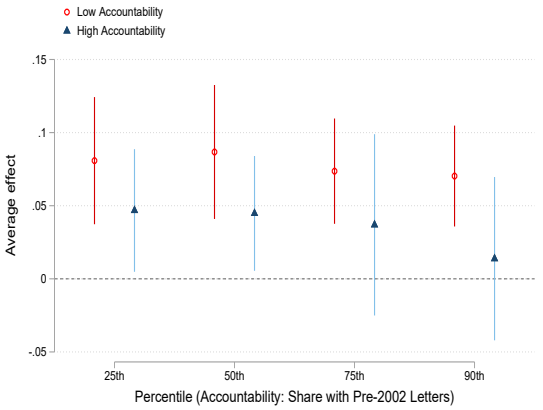
(a) Any Civilian Victims



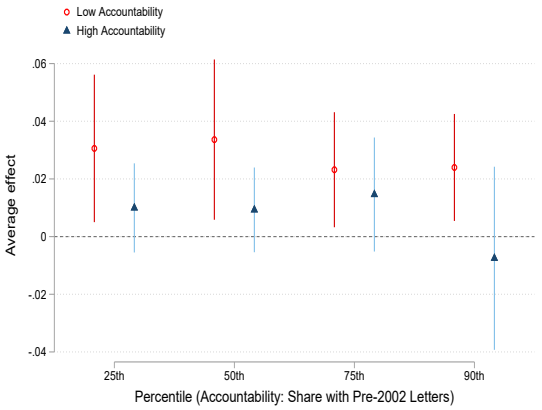
(b) Any Nightlights



(c) ELCs

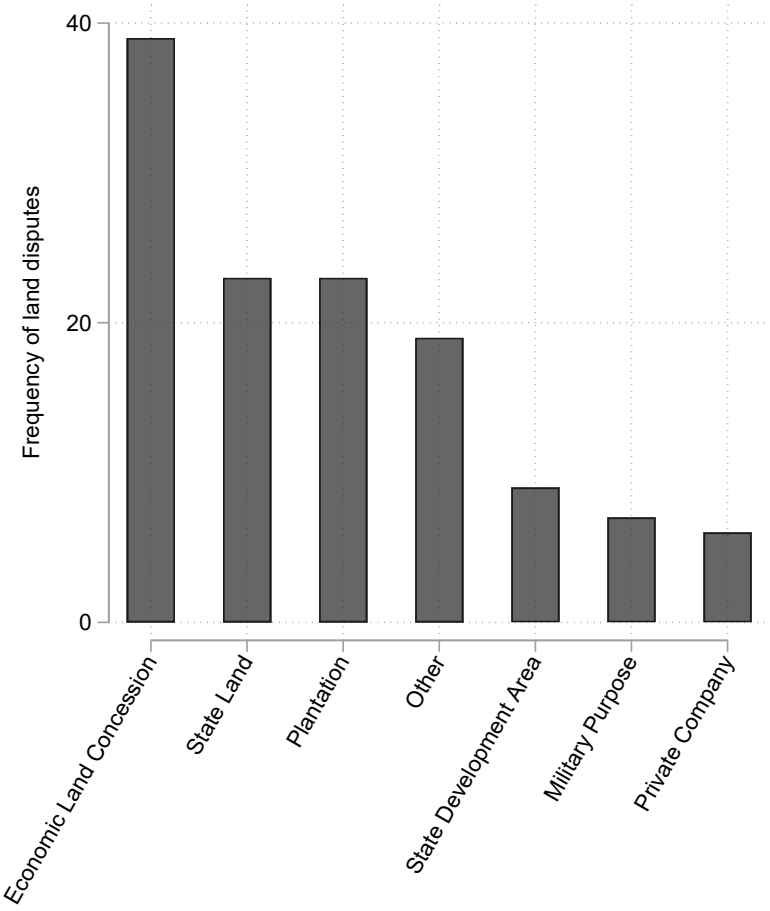


(d) Land Disputes



Notes: These figures plot the δ_1 and δ_2 point estimates and 95% confidence intervals from Equation 1 where we redefine the high and low accountability categories using alternative cutoffs (25th, 50th, 75th, and 90th percentile) for the share of farmers with pre-2002 letters of possession. 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.7: Land Disputes by Reason for Land Seizure



Notes: This bar chart shows the number of land disputes in the sample categorized by the reason for land being taken. 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.3: Variable Definitions and Sources

Variable	Description	Source
Treatment variables		
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% (top decile), and 0 otherwise. Alternative cutoffs are used in robustness tests.	National Census of Agriculture 2013
KR 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		
Number of 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 Number of Victims	Log of the number of civilian victims from mine-related accidents in each commune-year. A log + 1 transformation is applied to commune-years with zero victims.	OCHA / Open Development Cambodia
Any 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
Any Farmer Victims	Indicator equal to 1 if there were any farmer victims from mine-related accidents in a commune-year, and 0 otherwise.	OCHA / Open Development Cambodia

Table A.3 continued from previous page

Variable	Description	Source
Number of Farmer Victims	The number of farmer victims from mine-related accidents in each commune-year.	OCHA / Open Development Cambodia
Outcome variables: economic development		
Any Nightlights	Indicator equal to 1 if the mean nighttime luminosity in the commune is higher than 1, and 0 otherwise.	Defense Meteorological Satellite Program (DMSP) / Li et al. (2020)
Log Nightlights	Log nighttime luminosity in each commune-year. A log + 0.0001 transformation is applied to commune-years with zero nighttime luminosity.	DMSP / Li et al. (2020)
Log Nightlights (winsorized)	Log nighttime luminosity in each commune-year with extreme values adjusted to account for potential blooming, where very bright lights in one area lead to nearby areas appearing lit.	DMSP / Li et al. (2020)
Outcome 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
LN Disputes	Log of the number of ongoing land disputes plus 1 in each commune-year.	The NGO Forum on Cambodia
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
ELC Plantation Crops	Indicator equal to 1 if an ELC producing plantation crops (rubber, sugar, palm oil, or pulp) was present in a commune-year, and 0 otherwise.	LICADHO / Open Development Cambodia

Table A.3 continued from previous page

Variable	Description	Source
Forest Cover	The minimum level of the Normalised Difference Vegetation Index (NDVI) in each commune-year. Available 2000–2010.	MODIS/Terra Vegetation Indices 16-Day L3 Global 250m
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
Log Consumption	Log of household consumption expenditure, averaged at the commune level.	CSES
Control variables		
Longitude	Longitude in Eastings, calculated at the commune centroid.	QGIS
Latitude	Latitude in Northings, calculated at the commune centroid.	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
Share High Fertility Soil	The share of the commune where soil fertility is classified as high by Save Cambodia's Wildlife's Atlas Working Group.	Open Development Cambodia

Table A.3 continued from previous page

Variable	Description	Source
Log Market Access	Log of a time-varying market access measure constructed following Chiovelli et al. (2025). Used as a control in robustness specifications. See Appendix B for details.	Authors' calculations

Table A.4: Summary Statistics - Main Sample

	Mean	SD	Count
Treatment			
End Clearance	0.09	0.28	30799
Outcomes			
Number of Victims	0.82	6.90	30799
Log Number of Victims	0.20	0.58	30799
Any Victims	0.13	0.34	30799
Any Farmer Victims	0.02	0.15	30799
Number of Farmer Victims	0.06	0.62	30799
Any Nightlights	0.10	0.30	30647
Log Nightlights	-7.62	3.80	30647
Log Nightlights (winsorized)	-7.91	3.62	30647
Any ELC	0.05	0.21	30799
ELC Plantation Crops	0.02	0.12	30799
Any Disputes	0.02	0.13	30799
Number of Disputes	0.02	0.17	30799
Log Disputes	0.01	0.10	30799
Log Market Access	0.11	0.34	30799
Forest Cover	-0.04	0.15	17820
Accountability			
High Accountability	0.10	0.30	30799
Khmer Rouge Productivity Shock	0.50	0.50	30799
Covariates			
Longitude	104.79	0.99	30799
Latitude	12.11	1.00	30799
XY Interacted	1269.25	103.61	30799
Log Tons of Bombs	4.78	3.27	30799
Log Distance to Road (km)	0.39	1.44	30799
Log Distance to Province Capital	2.63	2.52	30799
Log Pre-KR Population	5.14	1.55	30799
Share High Fertility Soil	0.43	0.43	30799

Notes: The table presents summary statistics for our analytical sample, covering the years 1992 to 2010. Covariates are pre-determined, measured before the start of the sample period.

Table A.5: Letters of Possession and Productivity Shocks During the Khmer Rouge

	Accountability: Share of Farmers		High Accountability	
	(1)	(2)	(3)	(4)
More Productive During Khmer Rouge	0.046***	0.046***	0.026***	0.026***
	(0.015)	(0.015)	(0.009)	(0.009)
Province Fixed Effects	✓	✓	✓	✓
Commune-Level Controls		✓		✓
F-1st-Stage	9.480	9.282	8.474	8.800
Number of Communes	1621	1621	1621	1621
Pre-Treatment Mean	0.069	0.069	0.068	0.068

Notes: This table regresses our measures of local accountability on the Khmer Rouge productivity shock instrument 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 in the top decile of this share. 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.6: Robustness Checks – Average Effects – Victimization

	Any Civilian Victims				
	Control LN 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	-0.023***	-0.037	-0.012	-0.023***	-0.011
	(0.007)	(0.031)	(0.008)	(0.007)	(0.007)
Commune Fixed Effects	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓		✓	✓
Controls × Year FE	✓	✓	✓	✓	✓
Observations	27,578	28,167	27,861	28,167	27,005
Clusters	1,583	1,614	1,614	1,614	1,452
Pre-Treatment Mean	0.116	0.114	0.114	0.114	0.091

Notes: This table reports robustness checks for the effect of completed minefield clearances on the presence of any civilian victims in a commune. In Column (1), we control for the time-varying log of 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.7: Robustness Checks – Effects by Accountability – Any Civilian Victims

	Any Civilian Victims				
	Control LN 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	-0.037***	-0.084*	-0.030***	-0.040***	-0.032***
	(0.011)	(0.047)	(0.011)	(0.013)	(0.010)
Cleared × Low Accountability	-0.022***	-0.033	-0.010	-0.021***	-0.009
	(0.008)	(0.032)	(0.008)	(0.008)	(0.008)
Commune Fixed Effects	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓		✓	✓
Controls × Year FE	✓	✓	✓	✓	✓
Observations	27,578	28,167	27,861	28,167	27,005
Clusters	1,583	1,614	1,614	1,614	1,452
Pre-Treatment Mean	0.116	0.114	0.114	0.114	0.091
Difference High and Low Acc	-0.016	-0.051	-0.020	-0.019	-0.023
p-value	0.239	0.345	0.119	0.207	0.058

Notes: This table reports robustness checks for the effect of completed minefield clearances disaggregated by accountability on the presence of any civilian victims in a commune. In Column (1), we control for the time-varying log of 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.8: Average Effects - Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared	0.015	0.010	0.092	0.039	0.146	0.099
	(0.010)	(0.010)	(0.087)	(0.091)	(0.091)	(0.090)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.061	0.061	-8.247	-8.247	-8.462	-8.462

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 (a log + 0.0001 transformation is applied to account for zeros), and the log of the winsorized nightlights, which removes extreme values to prevent well-lit areas from affecting nearby areas due to blooming. 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. 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.9: Placebo Heterogeneity Splits

	LN Population	LN Road Distance	LN Prov. Capital Distance	Soil Fertility
	(1)	(2)	(3)	(4)
Panel A: Nightlights				
Cleared × Below Median	0.005	0.017	0.009	0.007
	(0.012)	(0.016)	(0.017)	(0.011)
Cleared × Above Median	0.015	0.003	0.012*	0.013
	(0.013)	(0.007)	(0.006)	(0.014)
Observations	28,148	28,148	28,148	28,148
Clusters	1,613	1,613	1,613	1,613
Pre-Treatment Mean	0.061	0.061	0.061	0.061
Diff. in Coefs. (p-value)	0.575	0.418	0.844	0.714
Panel B: Disputes				
Cleared × Below Median	0.023*	0.027**	0.016	0.006
	(0.013)	(0.011)	(0.014)	(0.013)
Cleared × Above Median	0.019	0.015	0.027**	0.033**
	(0.013)	(0.013)	(0.012)	(0.013)
Observations	28,167	28,167	28,167	28,167
Clusters	1,614	1,614	1,614	1,614
Pre-Treatment Mean	0.011	0.011	0.011	0.011
Diff. in Coefs. (p-value)	0.837	0.508	0.545	0.165

Notes: This table reports placebo heterogeneity tests. Instead of splitting communes by accountability (pre-2002 letters of possession), we split by potential correlates of accountability at the median based on pre-existing commune characteristics: population (Column 1), distance to the nearest road (Column 2), distance to the provincial capital (Column 3), and soil fertility (Column 4). Panel A reports results for nightlights and Panel B for land disputes. 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. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.10: Robustness Checks – With Continuous Accountability – Economic Development

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × Accountability	0.067**	0.065**	0.684**	0.682*	0.820**	0.752**
	(0.032)	(0.033)	(0.344)	(0.356)	(0.335)	(0.332)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.061	0.061	-8.247	-8.247	-8.462	-8.462

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 (a log + 0.0001 transformation is applied to account for zeros), and the log of the winsorized nightlights, which removes extreme values to prevent well-lit areas from affecting nearby areas due to blooming. 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. In even-numbered columns we also include 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 – With Continuous Accountability – Land Disputes

	Any Dispute		Disputes		LN Disputes	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × Accountability	-0.021	-0.023	-0.038	-0.040	-0.021	-0.023
	(0.031)	(0.032)	(0.031)	(0.032)	(0.022)	(0.022)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
Clearance Treatment	✓	✓	✓	✓	✓	✓
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
Pre-Treatment Mean	0.018	0.018	0.018	0.018	0.012	0.012

Notes: This table reports robustness checks for the effect of completed minefield clearances interacted with a continuous measure of accountability on land disputes in a commune. Any Disputes is an indicator for having any on-going dispute in the commune. Disputes captures the cumulative number of on-going land disputes in a commune and year. LN Disputes is ln(Disputes + 1). 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. In even-numbered columns we also include 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 – Effects by Accountability – Nightlights

	Any NTL				
	Control LN 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	0.036***	0.015**	0.028*	0.030**	0.045***
	(0.012)	(0.007)	(0.016)	(0.014)	(0.012)
Cleared × Low Accountability	0.011	0.009*	-0.004	0.008	0.008
	(0.010)	(0.005)	(0.009)	(0.010)	(0.011)
Commune Fixed Effects	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓		✓	✓
Controls × Year FE	✓	✓	✓	✓	✓
Observations	27,578	28,167	27,842	28,148	26,986
Clusters	1,583	1,614	1,613	1,613	1,451
Pre-Treatment Mean	0.055	0.061	0.061	0.061	0.069
Difference High and Low Acc	0.025	0.006	0.031	0.021	0.037
p-value	0.091	0.445	0.073	0.213	0.018

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 the time-varying log of 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.13: Robustness Checks – Effects by Accountability – Land Disputes

	Disputes				
	Control LN 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	-0.004	0.006	-0.027	-0.003	-0.008
	(0.017)	(0.009)	(0.028)	(0.018)	(0.017)
Cleared × Low Accountability	0.023**	0.010**	0.018*	0.024**	0.018*
	(0.010)	(0.004)	(0.011)	(0.010)	(0.010)
Commune Fixed Effects	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓		✓	✓
Controls × Year FE	✓	✓	✓	✓	✓
Observations	27,578	28,167	27,861	28,167	27,005
Clusters	1,583	1,614	1,614	1,614	1,452
Pre-Treatment Mean	0.012	0.011	0.011	0.011	0.014
Difference High and Low Acc	-0.027	-0.004	-0.045	-0.027	-0.026
p-value	0.144	0.654	0.118	0.170	0.174

Notes: This table reports robustness checks for the effect of completed minefield clearances disaggregated by accountability on the number of ongoing land disputes in a commune. In Column (1), we control for the time-varying log of 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.14: Robustness Checks – Average Effects – Nightlights

	Any NTL				
	Control LN 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	0.013	0.009*	-0.000	0.010	0.012
	(0.010)	(0.005)	(0.009)	(0.010)	(0.010)
Commune Fixed Effects	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓		✓	✓
Controls × Year FE	✓	✓	✓	✓	✓
Observations	27,578	28,167	27,842	28,148	26,986
Clusters	1,583	1,614	1,613	1,613	1,451
Pre-Treatment Mean	0.055	0.061	0.061	0.061	0.069

Notes: This table reports robustness checks for the effect of completed minefield clearances on the presence of nightlights in a commune. In Column (1), we control for the time-varying log of 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.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

E.1 Accountability Based on Share of Agricultural Landholdings Covered by Letters of Possession

Table A.15: Alternative Accountability Measure – Nightlights

	Any NTL		log NTL		log NTL (winsorized)	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	0.042***	0.039***	0.323**	0.297**	0.494***	0.449***
	(0.011)	(0.011)	(0.146)	(0.146)	(0.125)	(0.121)
Cleared × Low Accountability	0.012	0.008	0.072	0.016	0.114	0.066
	(0.010)	(0.010)	(0.089)	(0.093)	(0.093)	(0.092)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
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
Pre-Treatment Mean	0.061	0.061	-8.257	-8.257	-8.459	-8.459
Difference High and Low Acc	0.029	0.032	0.251	0.281	0.380	0.383
p-value	0.045	0.027	0.116	0.081	0.010	0.007

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), using an alternative accountability measure. Accountability is proxied by the commune-level share of agricultural landholdings with pre-2002 letters of possession, with high accountability defined as the top decile. We present three measures of this outcome: an indicator for any nightlights in a commune, the log of nightlights (a log + 0.0001 transformation is applied to account for zeros), 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: 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.16: Alternative Accountability Measure – Land Disputes

	Any Dispute		Disputes		log Disputes	
	(1)	(2)	(3)	(4)	(5)	(6)
Cleared × High Accountability	-0.005	-0.005	-0.010	-0.011	-0.005	-0.006
	(0.017)	(0.017)	(0.015)	(0.016)	(0.011)	(0.011)
Cleared × Low Accountability	0.022**	0.023**	0.025***	0.025**	0.016**	0.017***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.006)	(0.006)
Commune Fixed Effects	✓	✓	✓	✓	✓	✓
Province × Year Fixed Effects	✓	✓	✓	✓	✓	✓
Controls × Year FE		✓		✓		✓
Observations	28,158	28,158	28,158	28,158	28,158	28,158
Clusters	1,614	1,614	1,614	1,614	1,614	1,614
Pre-Treatment Mean	0.011	0.011	0.011	0.011	0.008	0.008
Difference High and Low Acc	-0.027	-0.028	-0.035	-0.036	-0.022	-0.022
p-value	0.145	0.131	0.044	0.042	0.077	0.071

Notes: This table reports the δ_1 and δ_2 estimates from Equation 1 for the effects of completed minefield clearances on land disputes, using an alternative accountability measure. Accountability is proxied by the commune-level share of agricultural landholdings with pre-2002 letters of possession, with high accountability defined as the top decile. The outcomes are any dispute, the number of disputes, and log disputes. 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.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.