

# ENVIRONMENTAL DEPRIVATION AND POLITICAL UNREST: Evidence from a Liberian panel survey.

Patrick Hunnicutt\*  
Kou Gbaintor-Johnson†

## Abstract

Shortages in environmental services like clean water and reliable electricity commonly underpin citizens' grievances with the state and have frequently preceded waves of protest around the world. Yet whether and how these shortages affect protest mobilization remains unclear. We adapt existing theory to identify the conditions under which environmental service shortages mobilize citizens for protest. Our specific argument is that non-state actors who are effective brokers moderate the relationship between environmental service shortages and protest. When citizens believe non-state actors can resolve shortages in environmental services on their behalf, they are less likely to protest after having experienced shortages. High-frequency household panel data collected over six months in Liberia's capital city of Monrovia substantiate our argument. Informally elected community leaders called "community chairpeople" dampen the otherwise mobilizing effect of environmental service shortages on protest when citizens perceive them as effective brokers.

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\*Ph.D. Candidate, Bren School of Environmental Science & Management, University of California, Santa Barbara. 2400 Bren Hall, University of California, Santa Barbara, 93106, [patrickhunnicuttt@ucsb.edu](mailto:patrickhunnicuttt@ucsb.edu). Corresponding author. **PH** conceptualized research, oversaw data collection, conducted data analysis, and drafted the manuscript. Thank you to Mark Buntaine, Matto Mildenerger, William Nomikos, Neil Narang, Geoff Henderson and other EPW seminar participants at UCSB, Darin Christensen and other seminar participants at UCLA, and conference participants at the 2019 Environmental Politics and Governance workshop for invaluable feedback. Edwin K. Johnson, Elton B. Gbaintor, James Vululleh, Mercy, Varney K. Tokpah, Winifred Kapel, and other staff at the Center for Action Research and Training, Liberia provided irreplaceable research assistance.

†Center for Action Research and Training, Liberia, [gbaintormeapehkou@gmail.com](mailto:gbaintormeapehkou@gmail.com). **KJ** implemented data collection and consulted on the manuscript.

Under what conditions do shortages in environmental services like clean drinking water catalyze protest? Government failures to provide environmental services both are a persistent barrier to safeguarding human well-being globally (Sachs 2012) and underpin many citizens' grievances with the government (Schreurs 2003; Deng and Yang 2013; Juan and Wegner 2019). Existing theory suggests that citizens should be more likely to mobilize for protest in response to grievances like environmental service shortages when they believe conventional modes of political participation like voting are insufficient to elicit government reform (Eisinger 1973; Kitschelt 1986; Harris and Hern 2019; Dyrstad and Hillesund 2020). This model of mobilization implicitly assumes that citizens cannot affect the policymaking process without directly engaging state actors, overlooking the important role that non-state actors and the informal institutions in which they are embedded affect state-society relations around the world (Helmke and Levitsky 2004; Baldwin 2015; Hönke and Müller 2018; Baldwin and Raffler 2019).

We offer an alternative explanation of protest mobilization which adapts existing theory to capture how actors and institutions outside of the state shape citizens' responses to environmental service shortages. Non-state actors commonly emerge as "brokers" who mediate citizens' interactions with the government when the state's capacity to govern is limited (Hönke and Müller 2018). One specific function of these brokers is to demand and elicit government reform on behalf of citizens who believe that conventional forms of political participation will not alleviate their grievances (Baldwin 2013, 2015; Magaloni, Diaz-Cayeros and Euler 2019). Non-state actors' capacities as brokers should moderate the effect of environmental service shortages on protest. Effective non-state brokers affect protest mobilization because they offer aggrieved citizens a pathway to government reform that is as effective as protest but less costly. If citizens believe that non-state actors can elicit government reform on their behalf, then they should be less likely to mobilize for protest when aggrieved.

We construct a six-month long panel dataset of 390 households in Liberia's capital city

of Monrovia to test our argument. These data allow us to estimate how perceptions of non-state actors called “community chairpeople” moderate the relationship between environmental service shortages and respondents’ willingness to protest. Community chairpeople are local leaders active throughout Liberia. They are informally elected and help communities interact with the Liberian government, even though they receive neither pay nor legal recognition from the state. Chairpeople are similar to non-state brokers in other settings, such as traditional chiefs in Zambia ([Baldwin 2015](#)) and town chiefs in Malawi ([Cammack, Kanyongolo and O’Neil 2009](#)).

We find that community chairpeople who are perceived as effective brokers dampen the otherwise positive association between environmental service shortages and protest. We take two steps to support a more causal interpretation of this result. First, data from three focus groups about protest we conducted in Monrovia help us identify, measure, and specify as covariates the most salient confounds of protest in our study’s setting. Second, we formally quantify the robustness of our main result to omitted variables using a simulation-based sensitivity analysis ([Cinelli and Hazlett 2020](#)). The results from this sensitivity analysis suggest that an omitted variable would overturn our result only if it induced substantially more bias than would omitting a theoretically-relevant covariate we already specify. It is unlikely that such a confound exists and is neither included in the battery of covariates we derived from our focus groups nor differenced out by our time and unit fixed-effects.

One concerning interpretation of our main result is that effective non-state brokers act as substitutes for the government when they redirect citizens’ responses to environmental service shortages ([Weber 1978](#); [Midgal 1988](#)). Additional data from our survey and interviews we conducted with acting community chairpeople in Monrovia attenuate this concern. We find that citizens who experience environmental service shortages but believe their chairperson is an effective broker report a lower willingness to shirk on tax payments for better environmental services, are less likely to perceive government officials as corrupt, and are

less likely to believe that protest is effective. Moreover, chairpeople describe themselves as complements to the Liberian government who work to maintain state-society relations, rather than actors who use government failures as an opportunity to supplant the state.

Three scope conditions inform the generalizability of our theory and results. The state must have some capacity for repression; and non-state actors must both be capable of holding government officials accountable and have some incentive to encourage citizens to seek government reform through means other than protest. These conditions characterize many developing democracies in the Global South, where non-state actors like traditional chiefs mobilize votes for government officials, personally benefit from improving state-society relations, and offer citizens a strategy for achieving reform that avoids the risk of violent repression ([Baldwin 2013, 2015](#)).

This article makes two contributions. First, it extends existing research on protest mobilization. Foundational theories of protest implicitly assume that citizens cannot affect the policymaking process without directly engaging government actors. Our theory relaxes this assumption, articulating how non-state actors who broker citizens' interactions with otherwise unresponsive governments affect the opportunity cost of protest. The decision to mobilize against the state reflects variation in citizens' exposure to government failures and capacity to elicit government reform through other means. We leverage household panel data to precisely capture this process, identifying the specific conditions under which grievances like environmental service shortages are likely to spark protest. Our mixed methods design allows us to interrogate the internal validity of our results and provides additional face validity for our argument.

Second, this article bolsters emerging research on the political consequences of environmental changes, such as the relationship between experiencing climate-related natural disasters and political participation ([Koubi et al. 2021](#); [Petrova 2021](#)). Governments frequently fail to provide their citizens with environmental services, like clean drinking water

and—of increasing relevance—security from climate change. Foundational work on the environment and violence argues that the relative scarcity environmental service shortages induce can exacerbate political instability absent effective institutions (Homer-Dixon 1999), as does more current research (Adano et al. 2012; Ide, Kristensen and Bartusevičius 2021). We quantitatively and qualitatively substantiate this claim at the micro-level in a novel setting. Shortages in environmental services can trigger destabilizing cycles of protest and government repression in post-conflict countries like Liberia. Non-state actors who are effective brokers help break this cycle, allowing aggrieved and otherwise disenfranchised citizens an alternative strategy to elicit government reform. Further exploring how non-state actors sustain citizens’ access to environmental services represents a critical field of future study.

## Theory

Under what conditions do shortages in environmental services mobilize citizens for protest? Government failures to reduce air pollution (Schreurs 2003; Deng and Yang 2013), safeguard drinking water (Reuters 2021), deliver reliable electricity (Juan and Wegner 2019), or provide other environmental goods and services frequently underpin citizens’ grievances with the state.<sup>1</sup> Foundational theories of mobilization rooted in the concept of “relative deprivation” argue that grievances like environmental service shortages are sufficient to spark protest (Gurr 1970). While recent scholarship has more precisely articulated the conditions under which grievances lead to protest (Griffin, Jonge and Velasco-Guachalla 2021), their role in mobilizing citizens remains unchanged: grievances motivate citizens to make extrainstitutional demands for reform. Contemporary applications of the grievances framework attribute protest to discrete government failures like the inability to address economic crises (Kurer et al. 2019) or reduce police-caused deaths (Williamson, Trump and Einstein 2018).

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<sup>1</sup>Electricity is an environmental service because generating reliable electricity often requires governments to effectively manage natural resources like rivers in light of environmental changes (Pacsi et al. 2013).

Other research on the structural determinants of protest contends that grievances are necessary but insufficient to spark mobilization, and instead points to the role of “political opportunity.” Two core ideas underpin opportunity-based theories of mobilization. First, aggrieved citizens are rational actors that use protest alongside other forms of collective action to elicit government reform; and second, the institutional environment in which aggrieved citizens are embedded structures the incentives to participate in different kinds of collective action (Eisinger 1973; Kitschelt 1986; Tarrow 1996; Meyer and Minkoff 2004). All else equal, opportunity-based theories of mobilization contend that protest is less likely to emerge in the presence of institutions that either increase the cost of protest or strengthen citizens’ abilities to shape the policymaking process through conventional forms of political participation like voting. For example, institutions which facilitate direct democracy are associated with lower levels of protest mobilization because they formalize citizens’ access to the policymaking process (Fatke and Freitag 2013). The state’s capacity to repress dampens protest mobilization by increasing its potential costs (Goldstone and Tilly 2001).

Scholars have usefully begun exploring how opportunity and grievance-based theories of mobilization interact, taking cues from early research that positions political opportunity as an intermediate variable linking grievances to protest (Eisinger 1973; Kitschelt 1986). For example, Shadmehr (2014) and Juan and Wegner (2019) argue that grievances affect protest mobilization by shaping would-be protesters’ expectations of government responsiveness. Harris and Hern (2019) attribute the wave of protest across the African continent between 2011 and 2015 to both unresolved material grievances about living conditions and shared beliefs among citizens that conventional modes of political participation were insufficient to elicit government reform. Relatedly, Hendrix and Haggard (2015) find that the mobilizing effect of food shortages on protest is limited to democracies that are unlikely to repress public dissent.

Research on the determinants of political violence similarly suggests how grievances

and political opportunity interactively explain protest mobilization. [Dyrstad and Hille-sund \(2020\)](#) show that lower perceptions of external efficacy amplify the positive association between grievances and support for political violence against the state.<sup>2</sup> [Nemerever \(2021\)](#) finds that attacks against federal employees tasked with managing public lands in the American West are more common among counties that both experienced grievance-inducing land transfer policies and are governed by sheriffs that serve as elite allies to disgruntled citizens.

Whether grievances and political opportunity affect protest mobilization remains an active empirical question, however. This uncertainty partially reflects the lack of systematic evidence documenting how political opportunity moderates the effect of grievances on protest mobilization irrespective of setting ([Lyon and Schaffner 2021](#)). Existing studies either rely on cross-sectional measures of grievances and political opportunity at the individual-level or aggregate time-varying measures of both variables to the group-level. The former measurement strategy helps explain why some citizens are more likely to protest than others, while the latter clarifies why protest is more likely to emerge in some places than others. Neither measurement strategy can precisely estimate how an individual citizen’s decision to protest is sensitive to changes in both their own material conditions (e.g., access to environmental services) and the political environment in which they are embedded (e.g., perceptions of government responsiveness).

Moreover, extant research tends to focus exclusively on how “formal” sources of political opportunity—features of state institutions—condition the effect of grievances on protest mobilization. Political opportunity is commonly measured as the openness of city governments ([Eisinger 1973](#); [Williamson, Trump and Einstein 2018](#)), the presence of elite allies in formal decision-making bodies ([Bruhn 2008](#)), the strength of opposition parties ([Lebas 2011](#)), the state’s capacity to repress ([Goldstone and Tilly 2001](#); [Shadmehr 2014](#)), or citizens’ percep-

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<sup>2</sup>External efficacy approximates political opportunity at the individual level because it captures whether citizens feel that participating in formal political processes will elicit a response from the government ([Wolak 2018](#)).

tions of external efficacy with respect to conventional modes of political participation ([Harris and Hern 2019](#); [Dyrstad and Hillesund 2020](#)).

Yet it is likely that actors and institutions which exist outside of the state represent “informal” sources of political opportunity that shape the dynamics of protest mobilization. Citizens frequently self-organize to establish governance, or “institutionalized modes of social coordination to produce and implement collectively binding rules, and/or to provide collective goods,” when the state’s capacity to govern is limited ([Börzel, Risse and Draude 2018](#), 9). In practice, this process involves authorizing a variety of non-state actors to establish and/or enforce informal institutions ([Helmke and Levitsky 2004](#)). Despite research documenting how modes of informal governance influence citizens’ perceptions of and interactions with the government ([Baldwin 2013](#); [Stokes et al. 2014](#); [van der Windt et al. 2019](#); [Magaloni, Diaz-Cayeros and Euler 2019](#); [Baldwin and Raffler 2019](#)), no systematic evaluation of their effect on protest exists.

In particular, non-state actors who mediate citizens’ interactions with the government represent an important source of political opportunity. These actors, commonly described as “intermediaries” ([Hönke and Müller 2018](#)) or “brokers” ([Hicken 2011](#)), are deeply embedded in particular communities and come in many forms, including traditional authorities ([Baldwin 2015](#); [Murtazashvili 2016](#)), informally elected community leaders ([Cammack, Kanyongolo and O’Neil 2009](#)), and prominent businesspeople ([Kitschelt 1986](#); [Scheiner 2007](#); [Berenschot 2018](#)). The specific role of non-state brokers is to facilitate the flow of information between citizens and the government at the local level ([Hicken 2011](#); [Hönke and Müller 2018](#)).

Non-state actors can function as effective brokers because of their role in mobilizing support for the government. Government officials target reform, like better public services, to garner electoral support across a number of settings ([Briggs 2021](#)). These officials often have poor information on where additional services are needed and lack the bureaucratic capacity to unilaterally delivery services. Traditional chiefs, community leaders, and other



non-state actors both can help government officials overcome these challenges, given their knowledge about local problems and ability to mobilize voluntary contributions to state-backed service projects. Non-state actors also can sanction government officials who fail to meet citizens' demands for reform, given their ability to mobilize voters ([Hicken 2011](#); [Baldwin 2013, 2015](#)).

There can be sufficient incentives for non-state actors to productively mediate state-society relations as citizens experience grievances like environmental service shortages. The authority of many non-state actors rests on their ability to satisfy citizens' demands for reform. It is likely that coordinating with the government to satisfy these demands is a more efficient strategy for non-state actors, particularly with respect to providing more complex public goods like better roads. Additionally, non-state actors invest in their own material well-being when they work with the government to improve local public service provision, since they often reside in the communities they represent ([Baldwin 2013, 2015](#)).

Non-state actors should expand citizens' perceptions of political opportunity when they are effective brokers, in at least two ways. First, effective non-state brokers provide citizens with an alternative strategy for resolving their grievances. Traditional chiefs in Zambia help citizens in rural communities secure better public goods and services from the government, as do town chiefs in Malawi ([Cammack, Kanyongolo and O'Neil 2009](#)). Second, non-state actors can improve citizens' perceptions of external efficacy in their role as brokers. For example, [McClendon and Riedl \(2015\)](#) and [McClendon and Riedl \(2021\)](#) show how religious leaders stimulate political participation by delivering sermons which emphasize individuals' capacity to make change in the face of extensive social, economic, and political problems. [Murtazashvili \(2016\)](#) similarly finds that non-state actors overseeing community-level governance in Afghanistan improve citizens' perceptions of government effectiveness and responsiveness.

Foundational theories of protest share one core principle: mobilization occurs when aggrieved citizens believe that conventional forms of political participation are insufficient to

change the status quo (Gurr 1970; Eisinger 1973; Kitschelt 1986). In many settings around the world, conventional forms of political participation include interacting with non-state actors to elicit government reform (Hönke and Müller 2018). Incorporating how non-state actors critically mediate state-society relations should further clarify the conditions under which citizens are most likely to mobilize for protest.

To that point, our specific argument is that efficacy of non-state actors as brokers moderates the effect of shortages in environmental services on protest. Non-state actors who successfully facilitate the flow of information and resources between citizens and the government constitute an informal source of political opportunity, either strengthening citizens' external efficacy or directly amplifying citizens' preferences to the government. Doing so ultimately increases the opportunity cost of protest, such that aggrieved citizens should be less likely to mobilize for protest when they believe non-state actors are effective brokers. This generates the following hypothesis:

**H1:** Conditional on perceiving non-state actors as effective brokers, citizens will be less willing to protest after they experience shortages in environmental services.

## Setting

We use six months of fieldwork in Liberia's capital city of Monrovia to test our argument. This West African country poses a compelling test for our theory. The two bouts of civil war Liberia experienced between 1989 and 2003 left its government weak. About 70 percent of Liberians express low levels of trust in government officials, and fewer trust the Liberian National Police (BenYishay et al. 2017; Karim 2020). By comparison, non-state actors are politically active in Liberia and enjoy higher levels of trust than do government officials. International actors have coordinated with village chiefs to reform land dispute resolution.<sup>3</sup>

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<sup>3</sup>See [press release](#) from the Carter Center.

Other traditional leaders have co-sponsored initiatives to combat sexual and gender-based violence.<sup>4</sup> Moreover, recent protests following the government’s failure to provide environmental services and enact broader political reform have generated anxiety about renewed conflict in Liberia, given how state repression contributed to the country’s first civil war.

## **Community Chairpeople and Statebuilding in Liberia**

We focus specifically on “community chairpeople”: non-state actors working at the community-level throughout Liberia. Citizens either organize informal elections to select chairpeople or rely on other customary political institutions to appoint them. Once in power, chairpeople serve between two and four years with various term limits.

### **Background**

Community chairpeople emerged during the second Liberian civil war to coordinate public service provision. They helped deliver World Food Programme aid and liaised with UN peacekeeping personnel. As the Liberian National Police regained strength, chairpeople acted as local reporters on issues like sexual violence. Chairpeople also guided international efforts to conduct community outreach and establish local care centers during the 2014-2016 Ebola crisis.

Community chairpeople remain active in throughout Liberia today. They help settle civil disputes, broker community interests to the government, and coordinate responses to flooding during the rainy season. Citizens also rely on chairpeople to manage access to government-provided environmental services like piped drinking water.

These tasks are delegated to community chairpeople because citizens believe they can hold the government accountable. Chairpeople can uniquely coordinate community resources to resolve services shortages; e.g., collecting small donations from wealthy community members

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<sup>4</sup>See [report](#) in Front Page Africa.

to restore electricity. Chairpeople also are credible brokers because they help mobilize votes for government officials during election years.

Along what dimensions are chairpeople similar to other non-state actors who work as brokers? Paramount, clan, and town chiefs are traditional leaders who work alongside community chairpeople in Liberia but are located higher in the country's hierarchy of informal governance. These chiefs are paid as civil servants that the Liberia government formally recognizes under its 1986 constitution (see Chapter VI, Article 56), whereas community chairpeople receive neither legal recognition nor pay from the state.

However, a key similarity between Liberian chiefs and community chairpeople is that both leaders' authority stems from elder councils. These customary political institutions were responsible for appointing chiefs in pre-war Liberia when succession based on kinship was unclear or contested, and remain influential in the selection of chiefs today ([Baldwin 2015](#)). Elder councils also oversee the election or appointment of community chairpeople. For example, the elder council of Monrovia's Slipway community intervened in the election of a new community chairperson following bouts of electoral violence.<sup>5</sup> Chairpeople also defer to the elder council when adjudicating serious disputes within the community.

Chairpeople are similar to other non-state actors who operate at the community-level outside of Liberia. Malawian town chiefs share many characteristics with community chairpeople: they are more prominent in urban settings, co-exist alongside other traditional leaders, receive neither pay nor legal recognition from the government, and manage their community's interactions with the state ([Cammack, Kanyongolo and O'Neil 2009](#)). The same parallels can be drawn between community chairpeople and *maliks* (village representatives) in rural Afghanistan, who are elected by community members, derive their authority from the customary mode of governance, and broker their community's interests to the government ([Murtazashvili 2016](#)). Chairpeople are also similar in function to informal civil

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<sup>5</sup>See [report](#), accessed June 8, 2021.

security patrols formed in post-conflict Guatemala, given that both exist because of the government's inability to deliver goods and services ([Bateson 2013](#)).

### **Community Chairpeople, Environmental Service Shortages, and Protest**

From January to February 2020, we conducted three focus groups to explore how community chairpeople condition citizens' responses to shortages in environmental services. Our research team recruited participants from three communities in Monrovia via a random walk protocol. All three communities reportedly experienced significant shortages in environmental services in the years prior but varied in their mobilization for protest. Men and women between the age of 18 and 60 participated in the focus groups and were compensated for their time. We present excerpts from the transcripts of these focus groups below.

We focus specifically on environmental service shortages for two reasons. First, service shortages are a common and salient grievance Liberian citizens experience on behalf of the government. Less than 20 percent of Liberians have reliable access to electricity. Access to safe drinking water and sanitation services is similarly unreliable.<sup>6</sup> These shortages have incited protest in recent years. Protesters often block major roads or the entrances to government offices. These demonstrations draw the attention of government officials who—wanting to re-open blocked roadways—can pressure service providers to act. Indeed, protests have forced the Liberia Electricity Corporation (LEC) to repair electricity infrastructure throughout Monrovia ([Genoway 2019](#)).

Second, restoring citizens' access to environmental services is one of community chairpeople's core tasks. Thus, citizens' beliefs about whether their chairperson is an effective broker plausibly conditions their responses to service shortages. When citizens believe their chairperson can hold government service providers accountable, then they may be less likely to protest in response to service shortages

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<sup>6</sup>For more information on service shortages, see [fact sheet](#) from the United States Agency for International Development and [report](#) from the World Health Organization.

Unsurprisingly, many focus group participants blamed service shortages on the government, commenting “the Government is preventing her citizens from accessing basic services” (FGD 1, R5). Some directly linked protest to service shortages: “The reason why people are protesting in Liberia almost every month is because the government is not providing those basic services to her citizens” (FGD 1, R2).

Participants who condoned protest focused on its ability to elicit “immediate” reform from the government (FGD 1, R5). Others similarly argued protest grabs the government’s attention (FGD 1, R4 and FGD 3, R3 and R5), “tells the government that there is an alarming situation” (FGD 2, R2), and lets “[the government] know that it is their responsibility to provide these services” (FGD 2, R4).

Not all participants agreed protest would help resolve service shortages. Some cited the complicated history of non-violent demonstrations and civil conflict in Liberia. State repression of protests against an increased rice import tariff contributed to political instability preceding the first Liberian civil war.<sup>7</sup>

Others participants discounted protest because they thought less costly ways to resolve service shortages existed. Some participants preferred contacting government service providers directly (FGD 1, R2 and R4). If this failed, then participants would deputize community chairpeople to restore services before protesting: “we will contact the government through our community chairperson...[and] if there is no redress, we will protest” (FGD 3, R5). Some claimed the first response to service shortages should always be deputizing chairpeople: “if [we] don’t have toilet, or other basic things like garbage [services]...let the community meet the community chairman...that is why we have a community chairman” (FGD 1, R1).

These responses suggest that community chairpeople can increase the opportunity cost of protest because they are appointed to elicit government reform on their communities’ behalf.

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<sup>7</sup>See report in the [Liberian Observer](#).

Only one focus group participant named their chairperson when asked who organized protest (FGD 1, R3), and more depicted chairpeople as an alternative strategy for achieving reform that precedes protest.

## Methods

The extensive fieldwork we implemented in Liberia lets us formally investigate if environmental service shortages and community chairpeople affect protest mobilization as hypothesized in **H1**. We first use novel household panel data to estimate how citizens' perceptions of community chairpeople moderate the association between environmental service shortages and protest. Then, we use interviews our research team conducted with acting chairpeople in Monrovia to further situate their ability to condition citizens' responses to shortages in environmental services.

## Quantitative Analysis

We collected household survey data from 15 communities in Monrovia between January 2020 and July 2020. Survey participants were recruited using a random walk protocol, which should produce an as-if random sample because it prevents enumerators from selectively recruiting participants.<sup>8</sup> Then, once a month for six consecutive months, enumerators administered the same survey to participants over mobile phones.<sup>9</sup> Our final sample consists of 390 households.

Using mobile phones to survey respondents helped us overcome constraints that can interrupt data collection in post-conflict settings. For example, we were able to adjust our data collection protocol and remotely continue research activities after the onset of COVID-19 in Liberia, as Appendix B clarifies. Our reliance on mobile phones also allowed research

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<sup>8</sup>See Appendix A for a description of this method and the demographic composition of our sample.

<sup>9</sup>Table E3 contains summary statistics for survey measures used in our analysis.

to continue safely and at low cost after gasoline shortages increased transportation prices and sparked general unrest in Monrovia. Appendix D discusses concerns about response bias and attrition that are common to mobile-phone based surveys.

## Measurement

Our dependent variable is survey respondents' stated willingness to mobilize for protest. Respondents were asked how willing they would be to participate in a protest march and to block a major road. Responses were recorded on a five-point Likert scale. We collapse responses to each question into a binary variable indicating whether or not a respondent is willing to mobilize for protest generally.

One concern with our dependent variable is that stating some willingness to protest could just be "cheap talk." We argue that this concern is attenuated in our study. Conceptually, expressing some willingness to protest does map onto our broader construct of interest: the intensity of respondents' opposition to the government. Moreover, data collection began in February 2020, following a series of violently repressed demonstrations in Monrovia. The opposition party leader who organized these protests later fled from Liberia to Sierra Leone. Unsuccessful attempts to extradite him followed. These events heightened political tensions in Monrovia, implying the cost of voicing anti-government sentiment was uniquely high during our study period. Indeed, many focus group participants hesitantly expressed their political views at first, perhaps fearing we would post group recordings on social media. Survey respondents faced the same risk, though enumerators constantly reaffirmed their anonymity. Nonetheless, we encourage readers to interpret our quantitative results as upper bounds, given that stated preferences for protest may not perfectly translate into mobilization.

We operationalize environmental service shortages using respondents' exposure to three shortages over the previous month: electricity blackouts, water shortages, and shortfalls in solid waste collection. These shortages are easily attributable to government actors in



Monrovia, including the Liberia Electricity Corporation (electricity), the Liberia Water and Sewer Corporation (water), and the Monrovia City Corporation (solid waste).<sup>10</sup> Survey respondents reported whether each service was available when they tried to access it over the past month. We take a count of the total services respondents could not access (0-3) as our primary measure, and specify additional measures of shortages as robustness checks.

We asked respondents to evaluate their community chairperson along two dimensions that should approximate their ability as brokers: their efficacy (“How confident are you that your community chairperson can fix a problem in your community?”) and their interests (“How confident are you that your community chairperson has the same interests as you?”). Responses to these questions were recorded on a five-point Likert scale. We sum how effective and representative respondents believe their chairperson to be as our primary measure, resulting in a score that ranges from zero to eight. As a covariate, we similarly measure respondents’ evaluations of district representatives—officials elected to the Liberian legislature.

Figure E2a shows how alternatively operationalizing respondents’ perceptions of their community chairperson (e.g., as a standardized score centered on the average chairperson evaluation over the study period) and respondents’ experiences of environmental service shortages (e.g., dummy variables indicating shortages in individual services) affects our results. Figure E2b displays our results when we alternatively operationalize respondents’ willingness to protest as an index score.

## Estimation

We use two-way fixed effects regressions to estimate how respondents’ evaluations of their chairperson moderates the association between experiencing environmental service shortages

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<sup>10</sup>Appendix B discusses common causes of shortages in these services.

and stating some willingness to protest. A generalization of our specification is

$$y_{it} = \alpha + \gamma_1 Service_{it} + \gamma_2 Evaluation_{it} + \gamma_3 Service_{it} \times Evaluation_{it} + \beta \mathbf{X}_{it} + \theta_i + \delta_t + \epsilon_j \quad (1)$$

where  $y$  indicates whether respondent  $i$  was willing to mobilize for protest in survey wave  $t$ ;  $\gamma_1$  represents the effect of experiencing an additional service shortage when respondents report no change in the evaluation of their community chairperson;  $\gamma_2$  measures the effect of respondents' evaluations of community chairpeople when they report no change in their exposure to service shortages;  $\gamma_3$  measures how the effect of additional service shortages on protest varies over changing evaluations of community chairpeople;  $\mathbf{X}$  is a matrix of time-varying controls (more below);  $\theta_i$  is a participant fixed effect; and  $\delta_t$  is a wave fixed effect. We cluster standard errors at the community-level ( $\epsilon_j$ ), since respondents' willingness to mobilize for protest likely is not independently and identically distributed within communities ([Abadie et al. 2017](#)).

## Identification

Our panel data allow us to specify wave and participant fixed-effects to control for time-invariant differences between participants, such as age, gender, and tribal affiliation. Therefore, our identification strategy hinges on specifying the correct set of time-varying covariates that might be endogenous to the relationship between environmental service shortages, community chairpeople, and protest.<sup>11</sup>

Feedback about protest from our focus groups inform the covariates specified in our analysis: income, the perceived efficacy of protest, evaluations of elected officials, expectations of violent repression, and the social obligation to protest. Each factor approximates the opportunity cost of protest and should be endogenous to our theoretical relationship of in-

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<sup>11</sup>We also assume linear additive effects ([Imai and Kim 2019](#)).

terest. If experiencing service shortages in communities where the chairperson is a poor broker limits economic opportunity, undercuts citizens' evaluations of their elected district representative, increases perceptions of protest's efficacy, lowers expectations of violent repression, and activates social obligations to mobilize, then these covariates might explain willingness to mobilize for protest independent of the interaction between service shortages and community chairpeople.

We caution readers against drawing strong causal conclusions from our analysis. While feedback from focus group participants increases our confidence that the aforementioned covariates capture the most salient dynamics of protest mobilization in our study's setting, we cannot specify the complete universe of potential confounds. As such, we subject our results to the omitted variable bias sensitivity analysis presented in [Cinelli and Hazlett \(2020\)](#). This sensitivity analysis allows researchers to formally quantify how strong an omitted variable would need to be to overturn their results, in relation to how much bias omitting a theoretically-relevant covariate the researcher specifies would induce. Results from this sensitivity analysis are particularly useful for studies like ours because they discipline the discussion about conditional ignorability. If a potential confound only nullifies our results when it induces significantly more bias than the covariates we specify would induce as omitted variables, then we can be more confident that any conditional association between environmental service shortages and protest we estimate is not spurious.

## Results

Effective community chairpeople moderate the relationship between environmental service shortages and citizens' willingness to protest in a way that accords with our theory. The association between experiencing additional environmental service shortages and stating some willingness to protest decreases as respondents form more positive evaluations of their com-

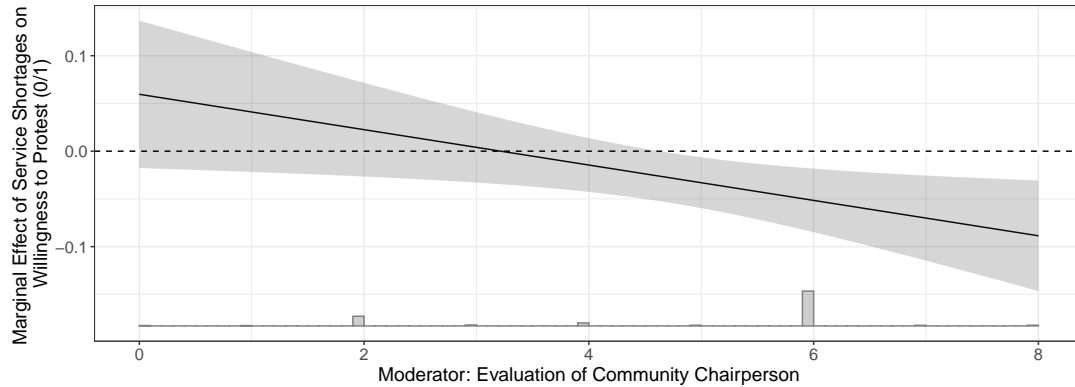
munity chairperson (Figure 1a). Every point increase in a respondent’s evaluation of their community chairperson corresponds with a 2.4 percentage point decrease in their willingness to protest after experiencing additional service shortages. Therefore, moving from a slightly negative to slightly positive chairperson-evaluation appears to dampen the positive correlation between service shortages and protest we observe among respondents whose chairperson-evaluations are very poor ( $te = +0.085, p = 0.026$ ). These results are robust to different measures of service shortages, chairperson-evaluations, and when we measure willingness to protest as an index (Figures E2a and E2b).

To test whether community chairpeople uniquely condition the relationship between service shortages and protest, we re-estimate our primary specification but include an additional interaction between service shortages and respondents’ evaluations of their district representatives. District representatives do not appear to moderate respondents’ willingness to protest after they experience additional shortages, at the conventional level of significance (Figure 1b). The point estimate for the representative-shortage interaction is nearly three percentage points smaller than the chairperson-shortage interaction. We can only reject the null hypothesis that both shortage-elite interactions are identical at the 10-percent level (Wald test,  $p = 0.07$ ). Therefore, we are marginally confident that community chairpeople uniquely mitigate the risk of protest following government failures.

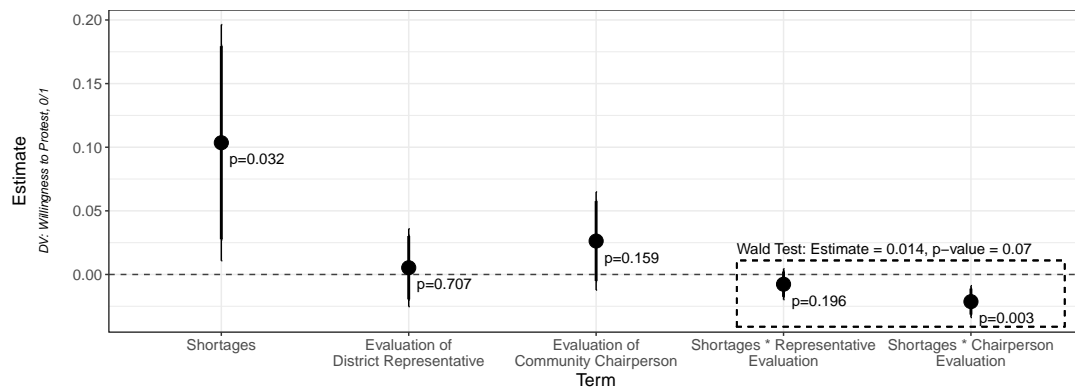
We perform diagnostic tests to make the inferential strength of our results transparent, in light of the assumptions underlying multiplicative interaction models (Hainmueller, Mummolo and Xu 2019). Overall, we are reasonably confident that our results are not the product of unreasonable extrapolation and that the conditional relationship between service shortages and willingness to protest is linear (see Appendix D).

**Figure 1:** Community chairpeople and environmental service shortages shape protest mobilization in Liberia.

(a) Effective community chairpeople moderate the association between environmental service shortages on protest.



(b) Effective community chairpeople moderate the association between service shortages on protest, but effective district representatives do not.



Note: we measure chairperson and representative evaluations as a score, shortages as a count, and willingness to protest as a dummy variable. In Figure 1a, we estimate the conditional association between service shortages and respondents' willingness to protest using an OLS regression. The marginal effects plots is generated using the *interflex* package in R. Ninety-five percent confidence intervals are displayed. Vertical bars on the x-axis represent the distribution of respondents' chairperson evaluations. In Figure 1b, we re-estimate our primary specification but include an additional interaction between service shortages and respondents' evaluations of their district representative. Both 90 and 95 percent confidence intervals are displayed as thin and thick vertical bars, respectively. The dashed box on Figure 1b encapsulates the two shortage-elite interactions included in our Wald Test for equivalence. Results from this Wald Test are displayed above the black dashed box.

## Sensitivity Analysis

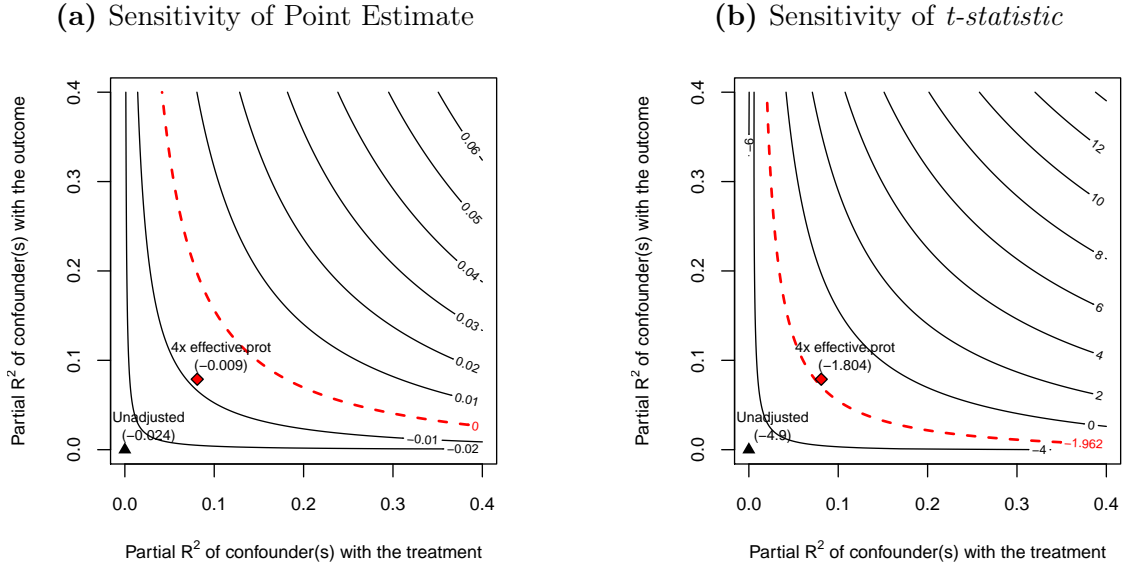
We implement the omitted variable bias sensitivity analysis proposed in Cinelli and Hazlett (2020) and applied in Hazlett (2020) and Hazlett and Mildemberger (2020). This analysis estimates the proportion of residual variance in both the treatment and the outcome an

omitted variable would need to explain to problematically change an observed treatment effect. To help with interpretation, the analysis benchmarks the strength of a potential confound against a theoretically relevant covariate that would be a significant source of bias if it was an omitted variable. We benchmark our sensitivity analysis against respondents' perceptions of protest's efficacy, given that these perceptions are very likely to be endogenous to our theoretical relationship of interest.

Figure 2b shows that an unobserved confounder would need to explain more than 7.6% of residual variance in both the treatment and the outcome to nullify the conditional association between service shortages and protest we estimate. An unobserved confounder 4 times as strong as the efficacy of protest would be as an omitted variable would not change the sign of the interaction between service shortages and chairperson-evaluations. An unobserved confounder of the same strength would only just nullify our main result at the conventional level of statistical significance. If an omitted variable induced approximately 3.8 more bias than omitting the efficacy of protest would induce, the conditional association between service shortages, chairpeople, and protest we estimate would remain statistically significant.

These results are especially insightful because the perceived efficacy of protest is an “important” covariate. Focus group participants who condoned protest often cited its efficacy. Respondents' perceptions of protest's efficacy also explains substantially more variation in their willingness to protest than do any of the remaining covariates we specify ( $t = 5.13$ ). Moreover, there are strong conceptual reasons to believe that the perceived efficacy of protest is very endogenous to our theoretical relationship of interest. Respondents who believe protest is effective might live in communities with a history of protest that the government has sanctioned with service shortages. The same respondents also may be more likely to protest because they believe their community chairperson is an ineffective broker, as our argument suggests. We struggle to think of another theoretically relevant covariate that is neither differenced out via our time and unit fixed effects (e.g., ethnicity, tribal affilia-

**Figure 2:** Omitted Variable Bias Sensitivity Plots



*Note:* Figure 2a demonstrates the sensitivity of the interaction between respondent’s exposure to service shortages and chairperson evaluation to different levels of unobserved confounding. The dashed red line represents the level of confounding at which the unadjusted point estimate we observe (plotted as a black triangle) would be equal to zero. Figure 2a demonstrates the sensitivity of the  $t$ -statistic for the interaction between respondent’s exposure to service shortages and chairperson-evaluation to different levels of unobserved confounding. The dashed red line represents the level of confounding past which the unadjusted  $t$ -statistic we (plotted as a black triangle) observe would be statistically insignificant at the conventional level. The red diamond (labeled “4x effective prot”) denotes how our estimated treatment effect (and its  $t$ -statistic) would change in the presence of an omitted variable four-times the strength of the efficacy of protest.

tion, changes in Liberia’s political climate) nor included in our battery of covariates and is approximately 3.8-times more endogenous than the perceived efficacy of protest.

This sensitivity analysis supports a more causal, albeit narrower, interpretation of our main result. Conditional on there being no omitted variable that is 3.8-times stronger than the efficacy of protest, we find that effective community chairpeople plausibly mitigate the otherwise mobilizing effect of environmental service shortages on respondents’ willingness to protest.

## Community Chairpeople and State-Society Relations

Our main analysis provides quantitative evidence that community chairpeople moderate the relationship between environmental service shortages and protest. Respondents who

experience shortages are less willing to mobilize for protest as they form stronger evaluations of their chairperson’s ability as a broker.

One interpretation of this result is that citizens are exiting formal political processes when they experience service shortages and their community chairperson is an effective broker. This interpretation is concerning for debates regarding the relationship between informal political authority and statebuilding, or efforts to restore the capacity and legitimacy of post-conflict governments (Sisk 2013). Conventional wisdom positions state and non-state authority as substitutes (Weber 1978; Midgal 1988), implying that non-state actors who engage in governance necessarily inhibit statebuilding efforts. If community chairpeople mitigate the mobilizing effects of service shortages on protest because citizens perceive them as substitutes for the Liberian government, the the immediate stability chairpeople provide while the government attempts to resolve service shortages may be less likely to translate into long-term political stability.

We implement two extensions of our main analyses to test whether chairpeople complement or substitute for the Liberian government. First, we test whether community chairpeople moderate other attitudes and behaviors citizens might express after experiencing environmental service shortages that plausibly signal their hesitance to confer legitimacy on the government. Second, we use interviews our research team conducted with community chairpeople in August 2020 to further describe their relationship with the government.

## **Quantitative Evidence**

Figure 3 suggests that community chairpeople complement district representatives when they displace citizens’ frustration with the government. The regression underlying Figure 3a interacts service shortages with a categorical variable recording whether respondents evaluated both their chairperson and representative positively, either positively, or neither positively. Respondents who experience additional service shortages and form stronger evaluations of



their chairperson exclusively appear eight percentage points less likely to protest, compared to respondents who report no improvement in either elite and experience additional shortages. Forming stronger evaluations of both elites only increases this point estimate by approximately three percentage points. Moreover, we find no evidence that positive evaluations of representatives alone moderate the association between service shortages and protest ( $te = -0.03, p > 0.1$ ).

We also estimate how respondents' perceptions of their community chairperson moderates the association between service shortages and three other measures of government legitimacy: respondents' tax morale, beliefs about government corruption, and perceptions of protest. If service shortages do not correlate with lower levels of tax morale, stronger beliefs about government corruption, and heightened perceptions of protest as an effective tool to catalyze policy change as respondents forms stronger evaluations of their chairperson's capacity as a broker, then we can be more confident that chairpeople facilitate statebuilding.

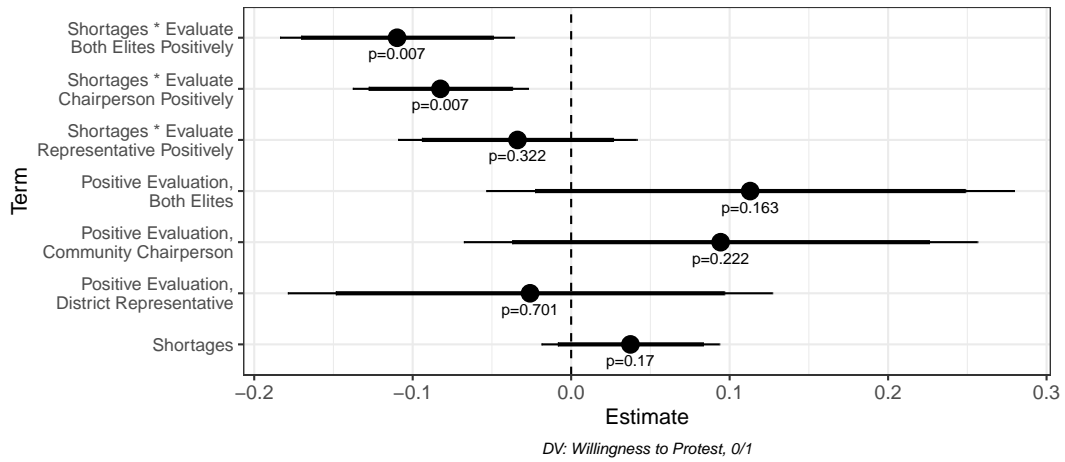
The correlational evidence presented in Figure 3b attenuates concerns that community chairpeople substitute for the state when they moderate the relationship between government failures and protest. Given the onset of additional service shortages, respondents who report a one-point improvement in their chairperson-evaluation state a lower willingness to shirk on tax payments for better environmental services, are less likely to report that their district representative is corrupt, and are less likely to perceive protest as effective.

## Qualitative Evidence

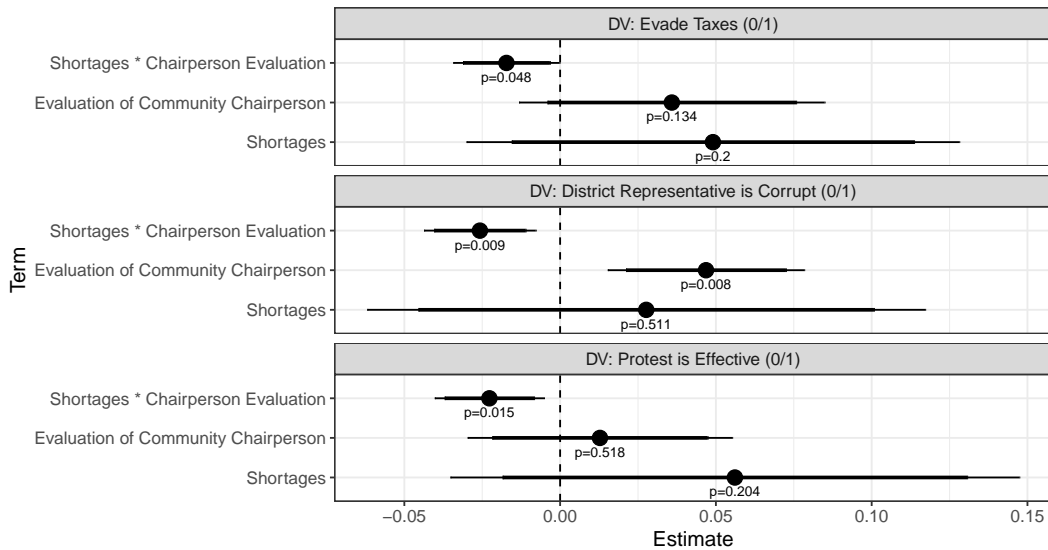
The opportunity to interview chairpeople from communities where we recruited survey respondents allows us to further comment on their relationship with the government. Chairpeople were recruited from the 15 communities where we sampled survey respondents. In total, we interviewed 12 chairpeople in our implementing partner's field office to ensure their privacy and the safety of the research team.

**Figure 3:** Community chairpeople complement the Liberian government.

(a) Effective community chairpeople independently moderate the relationship between environmental service shortages and protest, but effective district representatives do not.



(b) Effective community chairpeople moderate other anti-government responses to environmental service shortages.



*Note:* in Figure 3a we create a categorical variable measuring whether respondents evaluated both their chairperson and district representative positively (“Positive Evaluation, Both Elites”), either positively, or neither positively (reference category). In Figure 3b, we measure respondents’ evaluations of their community chairperson as a score. Service shortages are measured as a count in Figures 3a and 3b. All results are from OLS regressions with standard errors clustered at the community-level. Both 90 and 95 percent confidence intervals are displayed as thin and thick bars, respectively. For the three regressions underlying Figure 3b, we control for respondents’ evaluations of their district representative, income, and expectations that the government will repress protest.

Below, we discuss chairpeoples' responses to a prompt asking how they would react to two major government failures in their community: unsolved violent crimes and electricity blackouts. Both scenarios are common and are costly for chairpeople and their communities to endure. However, chairpeople cannot unilaterally address either because they lack the legal authority to do so. If chairpeople claim to not act extrajudicially in response to these scenarios, or encourage community members to forgo extrajudicial action, then we can be more confident that they complement the government.

Despite personal frustrations with government officials, chairpeople overwhelmingly expressed support for the state when asked how they would respond to costly government failures like unsolved violent crimes and environmental service shortages. For instance, consider one chairperson who said it was "so hard...to get in contact with government officials" because his district representative had "neglected the whole district" in recent years (Interview 1). When asked how he would respond to a prolonged electricity blackout, he promoted "engaging the government constructively" rather than encouraging the community to stage a protest (Interview 1). Furthermore, he would do community outreach to "educate" citizens about the government's limitations, if the government could not immediately restore electricity (Interview 1). This same chairperson reported having "taken two cases to the police...[about] attempted rape" in recent years rather than pursuing extrajudicial action (Interview 1). These responses collectively indicate a willingness to coordinate with the state when it fails to effectively govern.

Another chairperson similarly described his complementary relationship with the state, despite reporting "serious challenges" for engaging government officials (Interview 2). When asked what he would do if a major crime occurred in his community, he responded: "I would encourage my citizens, especially those [suspects] involved, to abide by the rules of the law...because this country is a country of law" (Interview 2). His statement is representative of how other chairpeople responded to these scenarios: e.g., "give the police a

chance...[because] you don't sabotage police investigations" (Interview 3), or "educate the community to understand that..[when a suspect] is not guilty...you can't kill them" (Interview 4).

How chairpeople responded to our questions on protest further emphasizes their role as complements to the state. Even though their opinions of protest diverged—some equated it to violence that "brings chaos" (Interview 5) while others emphasized citizens' "right to protest" (Interview 3)—each chairperson claimed they would intervene on behalf of the government if their community staged a protest. Responses ranged from encouraging citizens to resolve their grievances "diplomatically" (Interview 6) among chairpeople who condemned protest to ensuring protesters were allowed to "speak...within the confines of the law" (Interview 2) among chairpeople who condoned protest. Chairpeople who did not condone protest outright believed negotiating with the government would be more effective, stating the "best thing is dialogue" (Interview 4) because "there are so many ways that you can engage the government" (Interview 1).

Even though they receive neither funding nor legal recognition from the state and often are frustrated with government officials themselves, the chairpeople we interviewed do not appear to undermine support for the state when given the opportunity to do so. Chairpeople act in place of the government when it is absent, but as an informal extension of the state: e.g., preventing extrajudicial violence and encouraging their constituents to work with the government when experiencing environmental service shortages.

## **Discussion & Conclusion**

This article presents new insights about the relationship between grievances, political opportunity, and protest. Using original fieldwork from a post-conflict setting, we show non-state actors who citizens perceive as effective brokers mitigate the otherwise mobilizing effect of

shortages in drinking water, electricity, and solid waste services on protest.

Three scope conditions underlie our theory and results. Government officials must both be sensitive to non-state actors' demands for reform and have some capacity for repression, and non-state actors must have some incentive to encourage aggrieved citizens to seek reform through means other than protest.

These scope conditions are not restrictive because they characterize many developing democracies in the Global South. For example, village chiefs in Zambia govern locally, coordinate public goods provision with government officials who depend on them for mobilizing votes ([Baldwin 2015](#)), and may offer citizens an alternative path to reform given the the state's proclivity for repression ([International 2021](#)). [Baldwin \(2015\)](#) argues Zambian chiefs have strong incentives to coordinate with government officials because doing improves their well-being.

Additional research exploring what incentives non-state actors have to redirect citizens' grievances through existing institutions would help identify other settings where our theory and results would hold. While formally testing why community chairpeople redirect citizens' grievances with the state through existing institutions is beyond the scope of this study, we propose one explanation that may generalize outside of Liberia. Violent conflict may have directly increased chairpeoples' preferences for state authority, such they are more prone to encouraging aggrieved citizens to engage with the government instead of protesting against it. Exposure to wartime violence can increase citizens' political participation ([Blattman 2009](#)) and deference to the state ([Blair and Morse 2021](#)). It is possible that the legacy of civil conflict in Monrovia, where many witnessed wartime violence firsthand ([Vinck, Pham and Kreutzer 2011](#)), shapes chairpeoples' relationships with the government today.

One limitation of our study is that we focus on the relationship between citizens, non-state actors, and the government in an urban setting. There may be fewer incentives for non-state actors to work as brokers that constitute a source of political opportunity in

rural locations where the state struggles to both project power and deliver environmental services. Our results may weaken outside of the urban and peri-urban areas surrounding many capital cities in sub-Saharan Africa, though [Murtazashvili \(2016\)](#) finds that *maliks*—village representatives who are similar to community chairpeople—work to the same effect in rural Afghanistan.

Nonetheless, this article makes several contributions. First, we advance research on how grievances and political opportunity interact to explain protest mobilization. Our novel data collection strategy tracks monthly variation in citizens' exposure to environmental service shortages and perceptions of political opportunity, allowing us to disentangle the politics of protest at the micro-level. The multifaceted evidence and robustness checks we present facilitate a more confident interpretation of our results. Our theory articulates how non-state actors represent an important form of political opportunity around the world, and particularly so in areas where citizens are most likely to experience shortages in environmental services.

Second, this article speaks to ongoing debates about the political consequences of environmental problems like climate change. For example, some research implies that the conflict-inducing effects of environmental problems will be particularly acute in settings that lack effective democratic institutions which formally facilitate citizens' mobilization for collective action ([Gizelis and Wooden 2010](#); [Bernauer, Böhmelt and Koubi 2012](#)). Our study attenuates this concern, as does other research demonstrating how informal systems of land tenure help mitigate environmental conflict in Kenya ([Adano et al. 2012](#)).

Government failures to provide citizens with environmental services are pervasive and potentially threaten peace and development around the world. Actors and institutions which exist outside of the state can break the link between these shortages and political instability. While future research should test this proposition outside of Liberia, the practical implications of our results are clear. Policies aimed at mitigating the negative political effects

of environmental problems would benefit from coordinating with the local institutions that emerge to sustain citizens' access to environmental services.

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# Online Appendices

“Environmental Deprivation and Political Unrest: Evidence from a Liberian panel survey.”

## Contents

A	Sampling . . . . .	2
B	Common Causes of Environmental Service Shortages in Monrovia . . . . .	2
C	Qualitative Data Collection Activities . . . . .	4
D	Additional Robustness Checks . . . . .	8
E	Additional Tables and Figures . . . . .	13

## A Sampling

We worked with a Liberian research organization—the Center for Action Research and Training, Liberia—to construct the six-month long panel dataset used in our study. This panel dataset contains information from residents of the Greater Monrovia area, spread across 15 different communities. Recruitment to this panel and data collection proceeded as follows:

- Enumerators recruited thirty-five respondents per community. Twenty were randomly selected to participate in the monthly study; fifteen were used to replenish the panel given attrition.
- Respondents were recruited using a random walk protocol. Within communities, enumerators began recruiting respondents either near heavily trafficked areas, such as markets, or near LEC transformers. We focused on these points of interest to reduce the chance of recruiting respondents to increase the chance that respondents had household connections to basic services or could access them communally.
- Once a month for six months, enumerators contacted respondents and administered a thirty minute-long mobile survey. Respondents were compensated for their participation. Enumerators would attempt re-contacting respondents no more than three times per day for three days. Respondents were removed from the panel and replaced if we could not contact them after three days.

## B Common Causes of Environmental Service Shortages in Monrovia

We list common causes for service shortages below, based on conversation we had with service providers and our own observations during the fieldwork.

Solid waste services from the Monrovia City Corporation (MCC) can go short (e.g.,



no trash pickup) because (1) the MCC did not have enough resources or staff to perform scheduled cleaning; or (2) residents did not deposit waste in MCC bins.

Water services from the Liberian Water and Sewer Company (LWSC) can go short because (1) LWSC pipes broke; (2) drought; (3) mismanagement (e.g., LWSC incorrectly stops services for paying customers); and (4) illegal connections to LWSC pipes.

Electricity from the Liberia Electricity Corporation can go short because (1) LEC transformers/meters fail; (2) illegal connections to LEC transformers; (3) LEC fails to provide timely maintenance because international funding causes shortage of required supplies (e.g., transformers).

### **Adjustments to Data Collection**

After COVID-19 emerged in Liberia, we adjusted our data collection protocols so that they complied with public health ordinances in Monrovia. Our research team at the Center for Action Research and Training (CART) in Monrovia made this decision collaboratively, acknowledging that the suspension of project activities posed a significant financial risk to project staff, many of whom rely on payment from the project as their primary source of income (approximately \$200 USD/month). As other opportunities for employment in Liberia receded given the impact of COVID-19—e.g., the termination of other research activities that employed project staff—salaries from our project became the sole source of income for a majority CART’s employees.

Specifically, we:

- Limited the number of enumerators working in the CART office to three. No more than three enumerators were allowed into the CART office at one time.
- Committed to halting data collection indefinitely if an enumerator displayed COVID-19 symptoms.

- Limited the length of the workday. To ensure that enumerators could easily comply with the government’s public health order, we worked from 8AM to 12PM. Enumerators were compensated the same amount for each day of work, despite the shortened workday.
- Provided enumerators with personal protective equipment. Prior to entering the CART office, enumerators were required to use a CART-provided hand-washing station. Enumerators also received hand-sanitizer and a face mask for use throughout the workday.
- Physically separated enumerators in the CART office. Enumerators worked in separate rooms of the CART office to ensure that they remained at least six feet away from each other throughout the workday.
- Disinfected all project equipment and working areas at the end of each workday. The CART supervisor used Clorox to disinfect the phones, tablets, and working areas enumerators used during each workday. The CART manager wore gloves and a face mask while disinfecting workstations.
- Encouraged enumerators to travel on foot to the CART office, if possible.
- Provided enumerators a larger travel stipend to ensure that enumerators can take a private cab to and from the CART office if necessary.

## **C Qualitative Data Collection Activities**

Block quotations for the qualitative evidence we include in the main text from the focus group discussions and interviews we conducted are listed below.

## Focus Group Discussion 1: Jan-29-2020

- R2: “When there is no food for the citizen to eat, there will plenty noise behind the government. In other words, ‘a hungry man is an angry man.’ The reason why people are protesting in Liberia almost every month is that the government is not providing those basic services for her citizens.”
- R4: “The good side of protest is that it calls government attention, and the bad side is properties can get damage.”
- R4: “When government cannot provide services you need, you should continue to engage government or the agency that is responsible for providing that particular services that you are lack of.”
- R5: “The government is preventing her citizens from accessing basic services. Those agencies that are responsible for distributing these services like LEC [Liberian Electricity Corporation], LWSC [Liberia Water and Sewer Company] and MCC [Monrovia City Corporation] are not being monitored by the government. As a result, they go about doing their own things, which is seriously affecting us. At times, you will have credits in your meter but your light will just go off, and to get LEC to come and repair your meter is like a war; the same with LWSC and MCC.”
- R5: “The good side of protest is that result is immediate, and bad side is properties get damage, people get wounded in the process.”
- R5: “When I cannot access services that government should be providing for me, like LEC I will be patient and wait for God and government time. While waiting I will in provides by buying my flash light to sleep on, secondly if it is water that I cannot get, I will get water from the community well, and for dirt I will bury my dirt under the ground.”

### **Focus Group Discussion 2: Jan-31-2020, Seven Participants**

- R2: “The benefit of protest is it tells the whole world the poor performance of a particular government. It also tells the government that there is an alarming situation in the country that needs to be attended to.”
- R2: “Protest is not the best way to make change in Liberia. From our history, protest is not good for us. People always losing their lives in protest, properties damaged and protest also drive investors away.”
- R4: “If the government is not providing services to us as citizens, we will protest to make them to know that it is their responsibility to provide these services to us.”

### **Focus Group Discussion 3: Feb-03-2020, Seven Participants**

- R3: “Protest can also bring the government to attention.”
- R5: “The first thing is we will contact the government through our community chairperson. If there is no redress, we will protest.”
- R6: “The benefit of protest is you can get quick result. The bad side of protest is people will get injured in the process, some may will lose their lives and property will be damaged.”

### **Community Chairperson Interviews: Sep-2020**

- Interview 1: In describing how he used a television interview about iron contamination in his community to get government assistance, he comments “The water has iron in it...Slowly, slowly, slowly, you be dying, you don’t know. So that’s it. It’s so hard for me to get into contact with the government officials; I was so lucky that day when I did that interview and [was] surprised to see them in my community.”

- Interview 1: Asked how the government treats him generally, he responds “The representative? District number eight? The man neglected the whole district. The man neglected the whole district.”
- Interview 1: “That has been happening. I have taken two cases to the police; rape, attempted rape.”
- Interview 1: “The community youth wanted to stage a protest to block the road. I told them ‘No, under my leadership, you don’t do that.’...So what we do, we engage the government constructively, and listen...I educate them. I tell you, if I go to meeting, if I go to LEC, I come from there...and use the town crier to make an announcement.”
- Interview 1: “We can’t stage protest. The issue here; protest has two-fold. And that fold is: one, positive, and two, negative. And the negative aspect is more severe than the positive aspect.”
- Interview 1: “There are so many ways that you can engage the government, I really know that. That sitting in the street [i.e., protest] will not make government come in.”
- Interview 2: “In general, you know, we have serious challenges, because sometimes government at the time you be in need of them, they will not respond to you immediately.”
- Interview 2: “I think I would encourage my citizen, most especially those who are involved, to abide by the rules of law, to go through the investigation. Because, this country is a country of law; nobody is above it...I would encourage my citizens to always be law-abiding.”
- Interview 2: “The people will have to speak [i.e. protest] through their constitutional guidance...You let them speak, but it should be in the confines of the law.”

- Interview 3: “Well, you give the police a chance to do their investigation. You don’t sabotage police operations.”
- Interview 3: “That is their [i.e. citizens’] right to protest.”
- Interview 4: “We educate our community to understand that alleged crime does not mean that the man is guilty, so you can’t kill them. Because, in the past, our community was noted for beating on [suspects], killing [suspects].”
- Interview 4: “We would advise that protest is not the way, especially in this COVID-19 period...So the best way is dialogue.”
- Interview 5: “We put it under control. There are people that are not satisfied with the government. But we don’t; you know, the protest, it can bring chaos. So, we go to get a meeting and talk it.”
- Interview 6: “When we have issues, we manage to channel [them] diplomatically...In other communities, they are throwing stones and taking placards.”

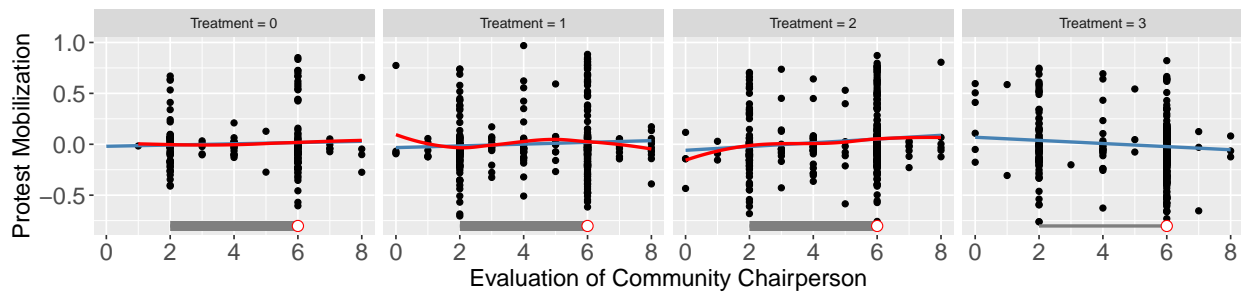
## D Additional Robustness Checks

### Diagnosis of Linear Interaction Effects

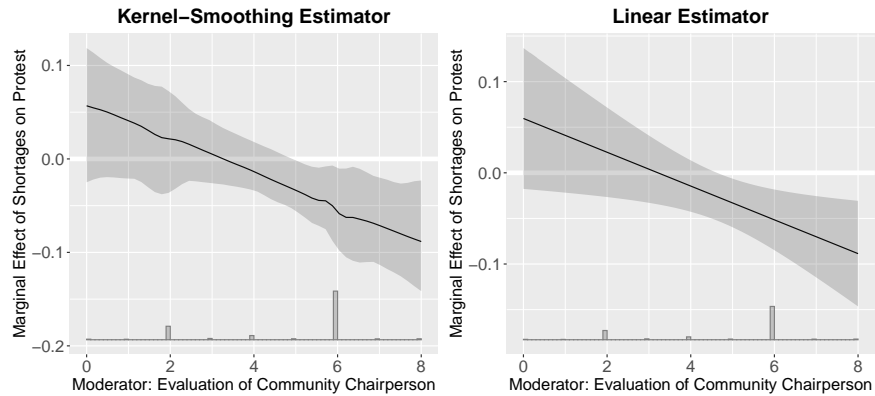
We refit our primary specification using the kernel smoothing estimator suggested in [Hainmueller, Mummolo and Xu \(2019\)](#), which allows us to flexibly estimate the functional form of the marginal effects of service shortages on willingness to protest across the full range of respondents’ evaluations of community chairpeople. Figure [D1b](#) plots the results of a standard linear multiplicative interaction model next to the results of the kernel estimation. The marginal effects of service shortages on willingness to protest the kernel estimator fits over various evaluations of community chairpeople appear reasonably linear and mimic the conditional marginal effects generated using a linear multiplicative interaction model.

**Figure D1: Linear Interaction Effect Diagnostics**

(a) Respondents' evaluations of their community chairperson vary over different exposures to service shortages.



(b) The conditional effect of shortages on willingness to protest is plausibly linear.



Note: figure generated using the *interflex* package in R. In Figure D1a, “treatment” is defined as the count of environmental services respondents report having gone short in the past month; blue lines visualize the linear association between chairperson evaluations and willingness to protest at each level of treatment; and the red line visualize the association between chairperson evaluations and willingness to protest at each level of treatment using a kernel-smoothing estimator. We measure respondents’ evaluations of community chairpeople as an index reflecting their effectiveness and inclusiveness.

Figure D1a also demonstrates that there is fairly common support for our moderating variable across different values of treatment. Respondents’ evaluations of their community chairperson vary from scores of 0 to 4. However, the majority of these responses are clustered around scores of 1 (“ineffective”/“self-interested”) and (“effective”/“representative”), particularly among respondents who experience shortages in all three services.

## Reporting Errors

The conditional relationship between service shortages and protest mobilization we observe might be due to respondents systematically overstating the environmental service shortages they experienced in the last month to “justify” their decision to protest. In anticipation of this challenge, the research team had designed a protocol to verify respondents’ reports of service shortages.<sup>12</sup> However, this protocol was halted during the first month of implementation due to the COVID-19 pandemic.

As an alternative strategy, we explore whether the number of service shortages citizens report is positively correlated with other measures capturing their dissatisfaction with the government: their willingness to protest, perceptions of government officials, and opposition to Liberian President George Weah. If reports of service shortages are systematically higher among respondents who are dissatisfied with the government, then our measure of service shortages may just reflect political attitudes rather than the objective material conditions of respondents.

To measure respondents’ support for President Weah, we rely on two proxy variables: their ethnicity and their community. Specifically, we code respondents as supportive of President Weah if they are of the Kru or Bassa tribe or if they live in Popo Beach, Central West Point, Slipway, Vai Town, or Zondo Town. Members of the Kru and Bassa tribe constitute

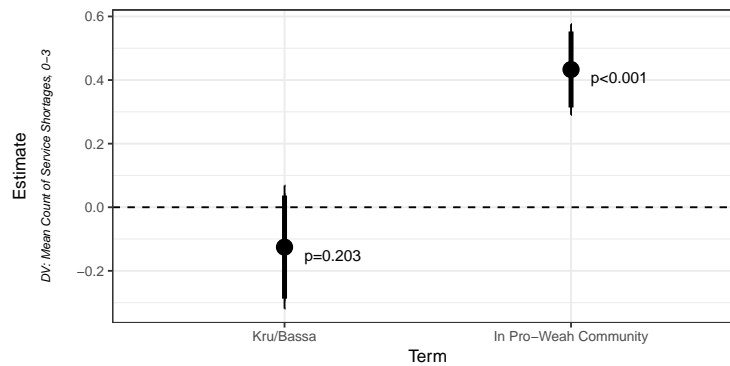
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<sup>12</sup>The design of the survey instrument also minimizes this risk. Respondents are asked about their willingness to mobilize for protest after they report to enumerators whether they experienced shortages in electricity, water, and solid waste services in the previous month.



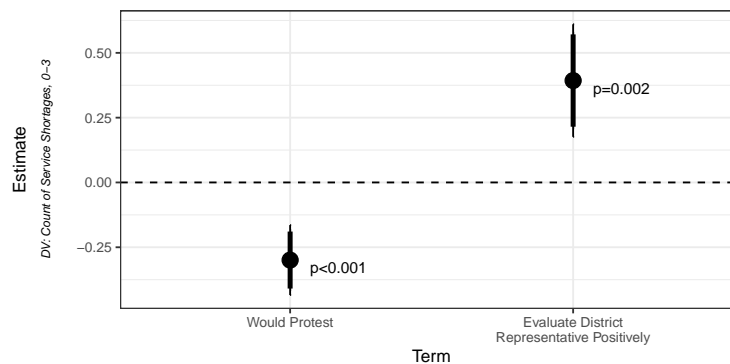
the bulk of support for the Weah administration. These citizens expressed continuous support for the President during the economic recession that has followed the onset of COVID-19 in Liberia and despite widespread discontent towards the government’s COVID-19 response. The aforementioned communities are referred to as “slum communities” in Monrovia and were the main targets of the President’s “Pro-Poor” campaign platform that saw him elected in 2018.

**Figure D2:** Co-ethnicity and co-partisanship with the incumbent party does not predict overreporting of service shortages in the hypothesized direction.



*Note: results from OLS regressions. All regressors are specified as dummy variables. Both 90 and 95 percent confidence intervals are presented respectively as thin and thick bars.*

**Figure D3:** Respondents’ dissatisfaction with the government does not predict overreporting of service shortages in the hypothesized direction.



*Note: results from OLS regressions. All regressors are specified as dummy variables. Both 90 and 95 percent confidence intervals are presented respectively as thin and thick bars.*

We find no evidence suggesting respondents who oppose the incumbent government report higher counts of service shortages per survey wave than do respondents who are not frustrated with the government (Figure D2). Respondents who are co-ethnics with President Weah do not report different counts of service shortages per month than do respondents who are not co-ethnics with President Weah. Moreover, respondents in Pro-Weah communities like Vai Town appear report slightly *more* service shortages per month than do respondents who do not reside in Pro-Weah communities. This pattern is inconsistent with concerns implying respondents' reports of service shortages reflect their frustration with the government rather than their living conditions.

Broader indicators of citizens' dissatisfaction with the government similarly do not comport with concerns about reporting bias (Figure D3). Counterintuitively, respondent who state some willingness to protest report *fewer* counts of service shortages per month than do respondents who state no willingness to protest. Respondents who evaluate their district representative positively report *greater* exposure to service shortages than those who evaluate their representative negatively. We would expect the sign on each of these point estimates to be flipped if respondents were strategically over-reporting their experience of service shortages to justify their frustration with the government.

### **Design Effects and Attrition**

To ensure that our findings are robust to design effects, we test whether the number of times that respondents participate in the survey predicts their willingness to mobilize for protest. We find no evidence that the number of times participants have been surveyed affects their willingness to mobilize for protest at the conventional level of statistical significance (SI Table E1).

We also investigate whether respondents who drop out from the panel over the study period (n=37) are meaningfully different from those who remain in the panel, since the same

factors that might predict attrition could predict respondents’ evaluations of their community chairperson, experience of service shortages, and willingness to mobilize for protest. To test whether attrition is plausibly exogenous, we test for balance among the variables used in our main analysis between respondents who dropped out of the panel and those who did not (see SI Table E2). We find that subjects who remain in our panel are comparable to those that drop out over the study period, along all of the variables we use in our main analysis.

## E Additional Tables and Figures

**Table E1:** Respondents are not more likely to express a willingness to mobilize for protest as they participate in additional panel waves.

	Estimate	Standard Error	N
Rounds Sampled	-0.07	0.09	2016

Note: +  $p < 0.1$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

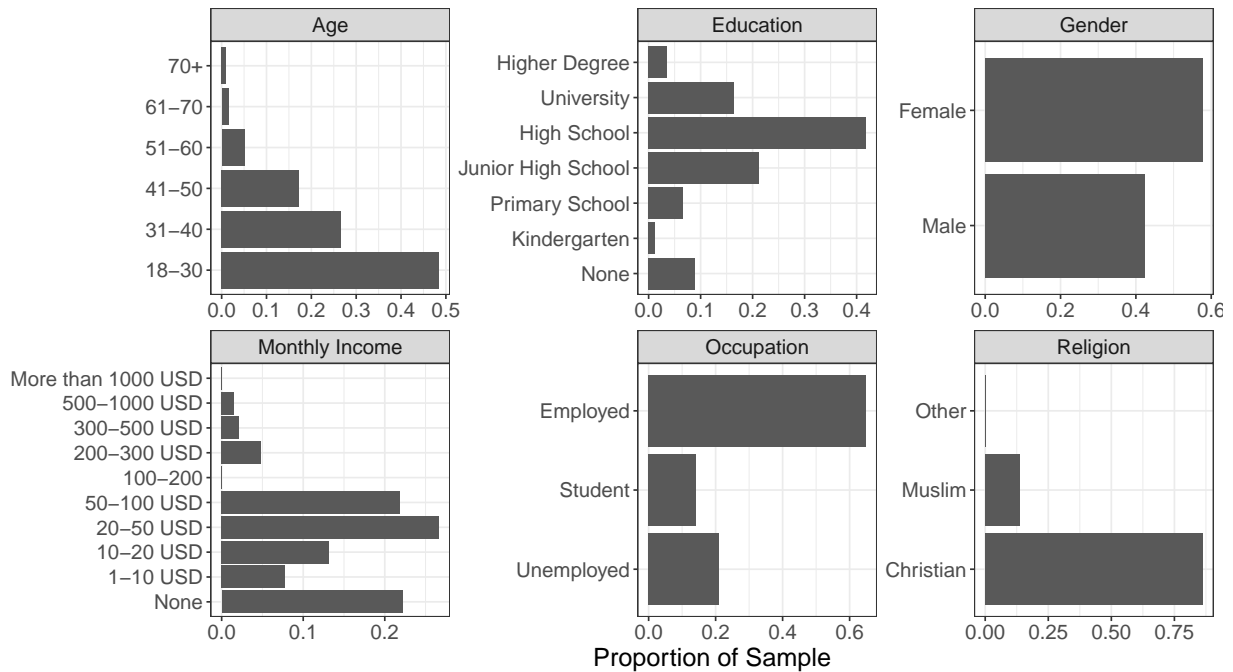
**Table E2:** Balance between subjects who did and did not drop out of the panel.

Variable	Abs. Std. Mean Difference
Count of Shortages (0-3)	0.01
Income (0-9)	0.02
Willingness to Protest (0/1)	0.03
Believe Repression is Likely (0/1)	0.04
Protest Effective (0/1)	0.06
Evaluation of District Representative (0-8)	0.05
Expressive Benefits from Protest (0/1)	0.07
Evaluation of Community Chairperson (0-8)	0.09

**Table E3:** Summary Statistics, Survey Measures

Group	Variable	Mean	Min	Max	SD	N
Protest	Willingness to Mobilize	0.13	0.00	1.00	0.34	2016
Service Shortages	Count	2.04	0.00	3.00	1.03	2014
	One Shortage	0.90	0.00	1.00	0.30	2014
	Two Shortages	0.69	0.00	1.00	0.46	2014
	Three Shortages	0.45	0.00	1.00	0.50	2014
	Electricity Shortage	0.83	0.00	1.00	0.38	1927
	Water Shortage	0.72	0.00	1.00	0.45	1988
	Solid Waste Shortage	0.79	0.00	1.00	0.41	1363
Elite Evaluations	Community Chairperson	5.02	0.00	8.00	1.73	2003
	District Representative	4.07	0.00	8.00	2.06	2005
Covariates	Efficacy of Protest	1.86	0.00	4.00	0.97	2013
	Expressive Benefits of Protest	0.31	0.00	1.00	0.46	2015
	Income	2.90	0.00	9.00	1.85	2012
	Repression Likely	0.48	0.00	1.00	0.50	1809

**Figure E1:** Sample Demographics (N=370)



**Table E4:** Main Results; Community Chairpeople, Environmental Service Shortages, and Protest

	DV: Willingness to Protest (0/1)		
	(A)	(B)	(C)
Service Shortages (0-3)	0.09*	0.10*	0.04
	(0.03)	(0.04)	(0.03)
Evaluation of Community Chairperson (0-8)	0.03	0.03	
	(0.02)	(0.02)	
Evaluation of District Representative (0-8)	-0.01	0.01	
	(0.01)	(0.01)	
Positive Evaluation, Community Chairperson (0/1)			0.09
			(0.07)
Positive Evaluation, District Representative (0/1)			-0.03
			(0.06)
Positive Evaluation, Both Elites (0/1)			0.11
			(0.08)
Expect Repression (0/1)	0.01	0.01	0.01
	(0.04)	(0.04)	(0.04)
Protest Effective (0/1)	0.05***	0.05***	0.05***
	(0.01)	(0.01)	(0.01)
Social Obligation to Protest (0/1)	-0.07	-0.07	-0.07
	(0.05)	(0.05)	(0.05)
Income (0-9)	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)
Shortages×Evaluation of Chairperson	-0.02**	-0.02**	
	(0.01)	(0.01)	
Shortages×Evaluation of Representative		-0.01	
		(0.01)	
Shortages×Evaluate Chairperson Positively			-0.08**
			(0.03)
Shortages×Evaluate Representative Positively			-0.03
			(0.03)
Shortages×Evaluate Both Elites Positively			-0.11**
			(0.03)
R <sup>2</sup>	0.47	0.48	0.48
Adj. R <sup>2</sup>	0.32	0.32	0.32
Num. obs.	1795	1795	1799
N Clusters	15	15	15

Note: \*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

**Table E5:** Secondary Results; Community Chairpeople, Environmental Service Shortages, and Other Anti-Government Attitudes/Behaviors

	DV: Tax Evasion <sup>1</sup>	DV: Gov't is Corrupt <sup>2</sup>	DV: Protest is Effective <sup>3</sup>
Service Shortages (0-3)	0.05 (0.04)	0.03 (0.04)	0.06 (0.04)
Evaluation of Community Chairperson (0-8)	0.04 (0.02)	0.05** (0.01)	0.01 (0.02)
Evaluation of District Representative (0-8)	-0.01 (0.01)	-0.12*** (0.01)	0.01 (0.00)
Expect Repression (0/1)	-0.13* (0.05)	-0.19** (0.06)	-0.15** (0.04)
Income (0-9)	0.00 (0.01)	-0.01 (0.01)	-0.05* (0.02)
Shortages×Evaluation of Chairperson	-0.02* (0.01)	-0.03** (0.01)	-0.02* (0.01)
R <sup>2</sup>	0.44	0.71	0.45
Adj. R <sup>2</sup>	0.27	0.63	0.30
Num. obs.	1794	1728	1795
N Clusters	15	15	15

Note: \* p< 0.05; \*\* p< 0.01; \*\*\* p< 0.001

<sup>1</sup>**Tax Evasion:** we ask respondents to indicate whether they should pay less, the same, or more in taxes to receive better services from the government. We collapse these responses into a dummy variable that takes a value of 0 if respondents are not willing to pay additional taxes and a value of 1 if respondents are willing to pay additional taxes.

<sup>2</sup>**Gov't is Corrupt:** we ask respondents how corrupt they think their district representative is, on a five-point Likert scale. We collapse these responses into a dummy variable that takes a value of 0 if respondents believe their district representative is not corrupt and a value of 1 if respondents think their district representative is corrupt.

<sup>3</sup>**Protest is Effective:** we ask respondents how effective they think protest is to achieve change in Liberia, on a five-point Likert scale. We collapse these responses into a dummy variable that takes a value of 0 if respondents believe that protest is ineffective and a value of 1 if respondents think protest is effective.

Outcome: *Willingness to Protest (0/1)*

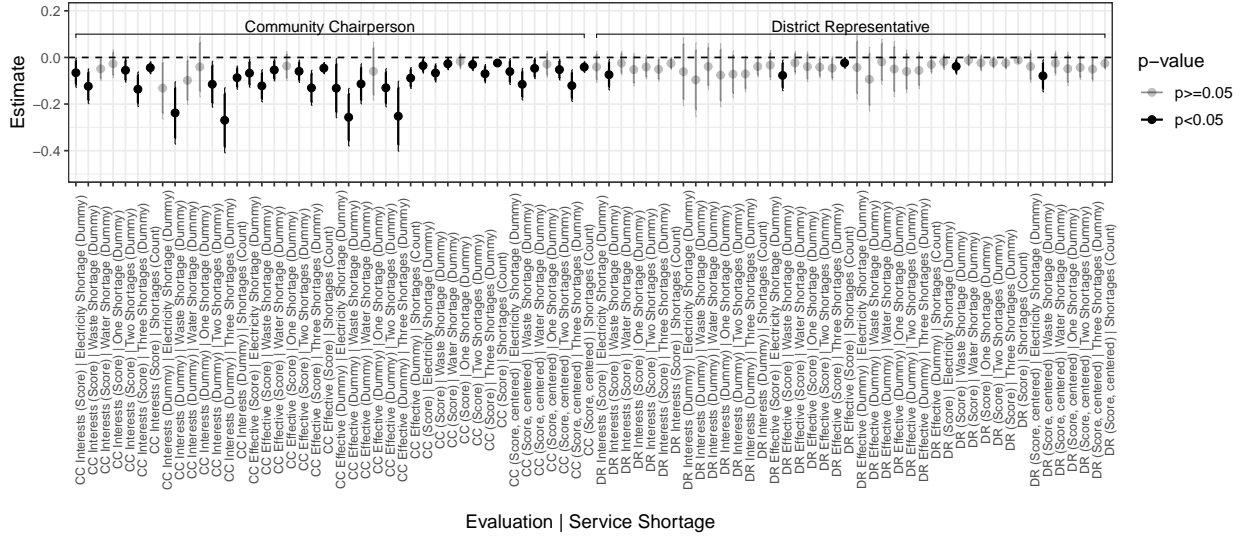
Treatment:	Est.	S.E.	t-value	$R^2_{Y \sim D   \mathbf{x}}$	$RV_{q=1}$	$RV_{q=1, \alpha=0.05}$
<i>Shortage × Chairperson</i>	-0.024	0.005	-4.917	1.7%	12.3%	7.6%

df = 1392

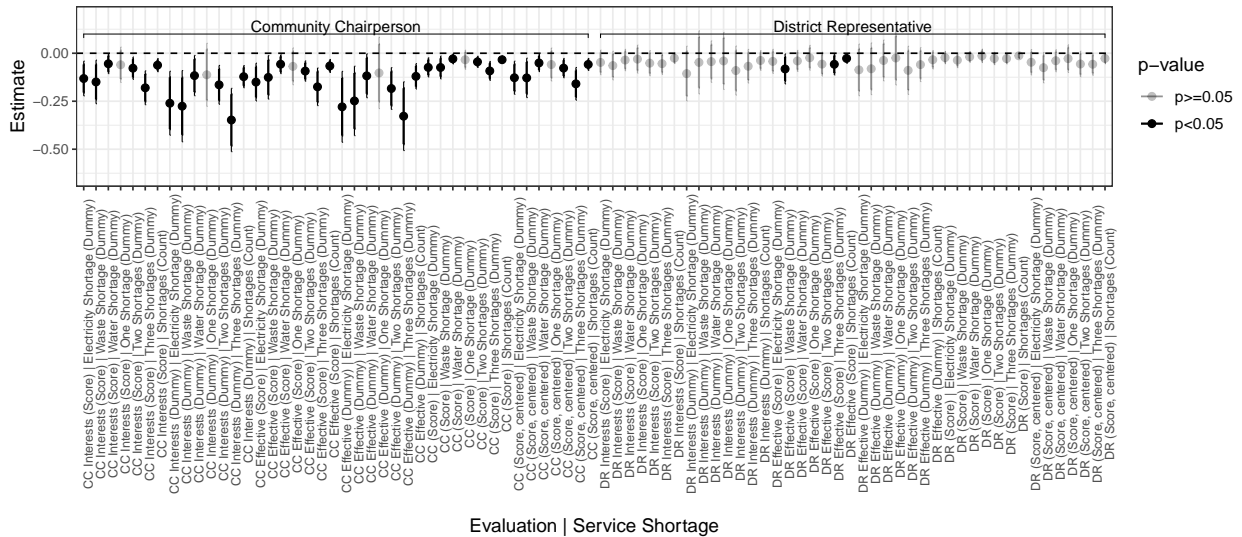
*Bound (1x effective.prot):*  $R^2_{Y \sim Z | \mathbf{x}, D} = 2\%$ ,  $R^2_{D \sim Z | \mathbf{x}} = 2\%$

Figure E2: Various Specifications of Main Results

(a) Protest Mobilization as a Dummy Variable



(b) Protest Mobilization as an Index Score



Note: each point estimate corresponds to the service shortage-elite evaluation interaction (see  $\gamma_3$  in estimating equation) from a single estimation. The constitutive terms of this interaction, and how they are operationalized, are listed on the x-axis. Black point estimates are significant at the 5-percent level, grey point estimates are significant at the 10-percent level, and transparent estimates are not statistically significant. This figure demonstrates that the main results presented in E4 are not extremely sensitive to various measurement strategies.