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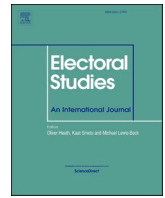
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Natural disasters and the limits of electoral clientelism: Evidence from Honduras[☆]

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ABSTRACT

The changing climate is leading to more frequent weather extremes across the globe, altering many aspects of social, economic and political life. In this paper we examine the impact of natural disasters on clientelism, a form of particularistic exchange in which voters are induced to eschew policy-oriented electoral decision-making in favour of voting for a party or candidate that offers them a targeted reward. We hypothesize that extreme weather should increase clientelism in contexts where it operates. But we also anticipate that multiple severe disasters may overwhelm clientelist networks, as demand outstrips supply. Triangulating quantitative and qualitative data, we test our expectations and find strong evidence that flood-based resources have been clientelized in Honduras, but that the combination of especially widespread flooding and the COVID-19 pandemic generated a situation where political parties were unable to use their clientelist networks effectively, as citizen need was too great.

1. Introduction

The effects of global warming are becoming evident across a range of settings as episodes of extreme weather interact with commonly-observed modes of social and political organization. We investigate the impacts of natural disasters on clientelism, which is a form of electoral misconduct observed in many contexts and a threat to democratic quality. Our data are drawn from Honduras, but there are reasons to believe that the patterns found there will be evident elsewhere as well, as other countries share the political characteristics of this Central American state.

Electoral clientelism – defined as the particularistic (targeted) exchange of votes for goods, money or benefits – is a common phenomenon throughout the world, especially in less developed countries. When the exchange of targeted rewards for votes becomes widespread, this can undermine electoral accountability and lead to democratic backsliding. Our principal conjecture is that extreme weather should increase the number of voters affected by clientelism. There are two main reasons for this: on the supply side, disaster assistance (relief, recovery and reconstruction resources) may be used by political actors as a clientelist resource whose distribution may be skewed by electoral considerations.

On the demand side, disaster-induced poverty can be expected to make voters more vulnerable to clientelist mobilization and easier for patrons to identify. However, beyond a certain level of disaster severity, we predict that weather-related shocks should overwhelm the capacity of clientelist networks.

This study draws together the literatures on clientelism and natural disasters, adding to the small but growing body of work on the electoral effects of extreme weather. Our analysis speaks to previous research that has found that extreme weather events boost clientelism in a variety of contexts, including Brazil (Cooperman 2022), Colombia (Gallego 2018) and the Philippines (Miranda 2019), and also to those studies that fail to find a clientelist effect (Fair et al., 2017; Fitch-Fleischmann and Kresch, 2021). It extends and informs this somewhat contradictory body of findings by providing evidence that extreme weather does fuel the exchange of goods for votes, but that severe and repeated natural disasters impair clientelism.

Our study also offers more convincing evidence than previous works. Most studies have relied on aggregate data, from which it is difficult to pinpoint individual-level effects with confidence. In contrast, our study triangulates the results of aggregate and individual-level data analysis with elite interviews, allowing us to explore impacts at the local and

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individual levels.

Next we offer a novel theoretical account of the relationship between clientelism and natural disasters. We then provide an overview of the Honduran context illustrating the empirical evidence of clientelism in this country. After introducing an empirical strategy that draws on individual-level data from the 2018 LAPOP survey data, the analysis of aggregate-level election results from 2013 to 2017 and 2017–2021, and qualitative data from original a dozen elite interviews conducted in 2022, we find evidence that flooding has been entrenched in Honduran politics as a source of clientelist goods. Yet we also find indications that the combination of two especially strong hurricanes coinciding with the COVID-19 pandemic overwhelmed the capacity of established political parties to distribute disaster relief to their client bases. We speculate that this may well have contributed to the victory of a newcomer party in the 2021 election. Despite the threat of democratic backsliding that extreme weather in theory represents, the effect of severe multiple disasters was the opposite in this case, as Honduras's highly clientelistic party duopoly was broken in the 2021 election.

2. Theoretical expectations

Some research has noted that the vote share of incumbent parties rises in the wake of flooding. This finding is commonly attributed to voter gratitude for flood relief, recovery and reconstruction measures (Bechtel and Hainmueller 2011) or to the 'rally round the leader' effect, whereby voters support the incumbent in times of crisis (Ramos and Sanz 2020). In some contexts, however, a citizen may vote for the incumbent because the delivery of flood assistance has been made conditional on their vote. This is the principal supposition that we set out to investigate in this paper. The politicized distribution of disaster alleviation resources can take the form of pork (club goods) allocated to entire regions, or it could be channeled through the more particularized mechanism of clientelism, ranging from the immediate exchange of vote-buying to longer-term transactional commitments between a party and its support base. We use the term 'clientelism' to refer both to the immediate exchange of votes for benefits and also to the granting of electoral support in exchange for social security that may extend over longer periods; what binds such practices together is a *quid pro quo* relationship understood by both parties to the exchange. Evidence of resources being disproportionately allocated to areas that support incumbent politicians has been found in India (Cole et al., 2012) and Russia (Lazarev et al., 2014) though such possibilities are not directly tested by these authors. Studies on Brazil (Cooperman 2022), and Madagascar (Francken et al., 2012) are consistent with the more particularized mechanisms of clientelism.

But not all studies find support for the politicization of disaster assistance. For example, following flooding in Pakistan, Fair et al. (2017) identify no evidence of partisan bias in, or incumbent benefit from, relief spending. In Nicaragua, Fitch-Fleischmann and Kresch (2021) also fail to find evidence of the politicization of disaster assistance after Hurricane Mitch. In Honduras study of disaster relief distribution following the same 1998 storm finds that aid was allocated to poorer households and those that had suffered greater losses, but that there was no relationship between these variables and the *amount* of aid allocated to affected households (Morris and Wodon 2003). This suggests (but does not demonstrate) that there might have been some other mechanism at play; it is plausible that political factors might have conditioned the magnitude of aid given to households. Importantly, there is evidence that international disaster relief was politicized following Hurricane Mitch (Bebbington et al., 2019).

A handful of analyses have explicitly assessed the 'clientelization' of disaster aid. In the paper that is most directly related to our interests, Gallego (2018) shows that municipalities affected by unusually heavy rainfall in Colombia in 2010-11 were more likely to re-elect incumbents, providing some evidence to indicate that this effect was linked to the receipt of flood relief funds. In the US, Bechtel and Mannino (2020) find

the allocation of disaster aid relief to be politicized: incumbent stronghold areas receive 40 percent more relief aid than swing states, and opposition strongholds receive 40 percent less aid, all else equal. In the Philippines, anecdotal evidence suggests that relief has successfully been used as a clientelist resource (Miranda 2019).

Based on previous findings of the politicization of disaster relief in many contexts, our expectation is that:

H1. Flooding makes it more likely that voters will be targeted with clientelist exchange efforts.

This hypothesis is consistent with the link between disaster relief and clientelism demonstrated in several countries; yet we still have a poor understanding of the mechanisms underlying it. We anticipate that flooding should increase clientelism through two distinct channels: one based on supply-side dynamics, and other grounded in the logic of demand. Though these channels are often not distinguishable empirically, it is worth spelling out the theoretical logic behind each.

The supply side causal mechanism is linked to the use that political leaders are likely to make of flood assistance resources. Natural disasters generate rents, as they lead to funding flows from international to national and from central to local levels. Rents can be captured by officials, especially those benefiting from informational asymmetries that afford them better insights than are available to donors (Yamamura 2014). International and national aid are both vulnerable to appropriation via rent-seeking (Klomp 2020) and there are links between disaster relief funds received and corruption (Nikolova and Marinov 2017).

An increase in the availability of flood assistance windfall could work similarly to income from other sources, increasing clientelism in flooded areas. A sudden influx of goods that can be exchanged for votes is a boon for potential patrons, who are often challenged by finite resources (Calvo and Victoria Murillo, 2019). If flood assistance can be deployed as a clientelist benefit, this allows brokers to better enforce compliance (Gallego 2018); and patrons to expand their networks and increase the chances that they will deliver to voters goods of sufficient value to sway their electoral choice.

On the demand side, flooding typically decreases household economic conditions and makes people who are needier; it also provides patrons with information useful for resource targeting. Calvo and Murillo (2019) demonstrate that clientelism only works if brokers can identify needy people and identify also what they need. Flooding, we argue, may serve as a heuristic through which brokers locate potential targets together with their most pressing requirements. When an area is flooded, this immediately singles out residents of that area as people who are in need of assistance, which can potentially be made conditional on electoral support. Flooding should thereby increase *opportunities* for clientelist mobilization while simultaneously boosting the *ability* of potential vote-buyers to identify suitable targets and supply them with needed goods.

It bears emphasizing that we are not proposing that extreme weather might spawn clientelism where it has not before been practiced, but rather that episodes of extreme weather can be expected to increase the incidence of clientelist exchange by altering the supply of clientelist goods and voter demand for exchanges of this type.

Moreover, the mechanisms described are not mutually exclusive and may work together. Diaz-Cayeros et al. (2016) argue that parties in Mexico adopt mixed portfolio strategies, using both the targeting of individuals and collective benefits addressed to entire communities (cf Calvo and Victoria Murillo, 2019). Like Mexico, Honduras has an established party system with long-standing clientelist networks. We might likewise expect flood relief resources to be directed toward affected municipalities to repair damaged roads, bridges and other infrastructure, and also to individual members of client groups who have been directly affected by flooding.

When assessing how flood resources are clientelized, it is also important to consider which political actors are most directly involved. In Honduras, municipal authorities play an important role in

distributing disaster relief and reconstruction resources (see below), and also in running political machines (Gonzalez Tule and Rodriguez, 2020). We thus expect municipal-level political elites to be best positioned to exploit floods for political benefit. If they are successful, the vote share of the local incumbent ought to increase in consequence.

The dynamics we hypothesize assume that clientelist networks are adequately endowed with the resources that relevant groups of voters need, such that established parties can operate ‘machines’ regularly extracting resources from the state and channeling them to targeted groups of voters for electoral benefit. In this context, the regularity with which Honduras is hit by tropical storms enables parties to benefit regularly from the extra resources that are made available when floods strike. Incumbent parties may not be able to count on a flood occurring conveniently in advance of each and every election, but when floods do take place, parties are equipped to make the most of them.

However, disasters of an unexpected scale or the occurrence of multiple disasters in a short period of time may threaten disaster-related clientelism. As the magnitude of disaster-affectedness increases, citizen demand for clientelist goods increases, and beyond a certain point, demand could outstrip supply. If parties do not have sufficient resources to cater to all those seeking assistance, many voters’ needs will be left unmet, and they will then be less willing to reciprocate when voting. The supply of clientelist goods can be expected to increase up to a point as disasters become more severe, but they may not increase in line with demand if resources are scarce and/or if the disaster itself reduces resource availability or distributive capacity. Unmet clientelist needs may even spawn a backlash against the informal institution of clientelism itself if voters begin to reflect on the ethics of the practice, and this may increase its reputational costs for parties that engage in it.

This situation is likely to arise in the context of ‘compound’ disasters, which lead to high financial loss (Gissing et al., 2022), thereby reducing funds available for clientelist purposes, and they may require novel and distinctive disaster management approaches (Kruczkiewicz et al., 2021), potentially disrupting economies of partisan resource-extraction.

The COVID-19 pandemic was an especially severe event that also compounded disaster impact in many of the disaster-prone countries it affected. Comparative research on the impact of the pandemic on electoral outcomes indicates that early on, incumbents and mainstream parties benefited from the crisis, but over time electorates turned against governments as frustration increased and deprivation worsened (Bisbee and Honig 2022; Pavkovic 2021). Most of the research on this topic has been conducted in democratic countries with limited clientelism, however, and research on the impact of COVID-19 on clientelist links is sparse.

By contrast, it is possible in theory that the combination of meteorological and health crises would have provided more opportunities for clientelist mobilization than either crisis on its own, as clientelism tends to be most successful among poor voters, and both events increased poverty; in other words, the relationship between disaster affectedness and clientelism could be linear. Yet it is unclear that most clientelist machines would continue to be able to deliver the goods under the dire circumstances faced by local authorities, with high numbers of acutely needy residents and limited resources. It is therefore possible that parties may not be able to clientelize disaster relief so effectively when the impact of disasters is unusually severe or several disasters occur in a short time period, rendering the relationship non-linear. These alternative possibilities suggest two versions of our second hypothesis.

H2a. Flooding is associated with clientelism; the more people who are affected, the more opportunities there are for parties to engage in clientelism and the more votes they win.

H2b. Flooding is associated with clientelism non-linearly; up to a

point, the more people who are affected, the more opportunities there are for parties to engage in clientelism and the more votes they win, but following unusually severe or multiple disasters, demand for clientelist goods exceed supply, and parties are less able to benefit electorally from the clientelistic potential of disaster relief.

3. The Honduran context

Honduras is a middle-income polity with competitive elections since democratization in 1982 with ‘Polity’ scores ranging between 5 and 7 since democratization, placing it in the category of partial democracy (Polity V 2020). A coup in 2009 cast doubt on the country’s democratic credentials. Electoral management has been politicized, and electoral processes have been beset by violence (Ugues 2014).

Clientelism has long been practiced in Honduras (Morris 1984; Taylor-Robinson, 2009), as in many Latin American countries (González-Ocantos et al. 2014; Stokes et al., 2013). In the Honduran context, parties are the main vehicles of clientelism, and their links with long-standing support bases tend to be transactional (Taylor-Robinson, 2009: 117). Throughout most of the 20th century, Honduran politics was dominated by the National and Liberal parties (*Partido Nacional de Honduras* and *Partido Liberal de Honduras*), both mobilizing voters through the provision of particularistic benefits (Gonzalez Tule and Rodriguez 2020; Morris 1984; Taylor-Robinson, 2009). All 12 of our interviewees stated that clientelism was a ‘structural’, ‘pervasive’, ‘recurring’, ‘ingrained’ phenomena in Honduras.

Honduras has recently had the highest rate of clientelism in the region (Miranda Leibe 2017). Clientelist networks have been found to target voters who on average are more likely to have lower education and income levels, rural residence, belonging to indigenous groups (Meléndez 2014; Taylor-Robinson, 2009), and those with strong partisanship, especially with the Nationalist Party (González-Ocantos, Kiewiet de Jonge, and Nickerson 2015; Meléndez 2014). Goods distributed in exchange for votes typically take the form of preferential access to state resources such as jobs, welfare assistance, school scholarships, permits and licenses, and community-targeted pork such as new schools or paved roads (Taylor-Robinson, 2009: 116-22).

Honduras has long been vulnerable to tropical storms and the flooding they commonly bring. The Central American polity of approximately 10 million inhabitants wedged between the Caribbean and the Pacific owes its very name – ‘watery depths’ in Spanish – to the risks that storms pose to ocean-going voyagers (Morris 1984: 1). Its economy and social system has been devastated on several occasions by tropical storms, including Fifi in 1974, Mitch in 1998 and the twin storms of Eta and Iota in 2020.

The dependence of the country’s economy on agriculture makes it particularly vulnerable to the effects of natural disasters (COPECO 2018). Severe inequalities in land ownership have exacerbated the impacts of extreme weather events. Large agricultural concerns have taken over much of the best agricultural land, displacing peasants to steep hillsides and flood plains, more vulnerable to the ravages of storms including landslides and flooding (Wisner et al., 2004: 245).

During the period under analysis, the Comité de Alertas de la Comisión Permanente de Contingencias (COPECO) was the state body in charge of disaster management. International and domestic aid agencies work to distribute disaster assistance together with state bodies, including municipal emergency committees (Comités De Emergencia Municipal, CODEM). Aid organizations have also engaged in direct assistance to communities, due to the perception of government corruption while municipal disaster relief processes have been vulnerable to politicization (Telford et al., 2004), and anecdotal accounts from election observers indicate that flood relief has been clientelized:

the most pertinent and certainly most frequently observed phenomenon was that of the very blurred distinction between the Government and the Partido Nacional during the distribution of goods and services in the context of State social programmes, such as Bolsa Solidaria (Solidarity Bag), Vida Mejor (Better Life) or Bono 10,000. For example, in Cortés the PN stored and distributed goods through the government's Vida Mejor programme in response to floods which affected the northern part of the country just weeks before the elections, from the party headquarters. ([European Union Election Observation Mission, Honduras 2017 \[EUEOM\], 2018: 12](#))

Weak state capacity in Honduras combined with the state's chronic inability to protect the population from the ravages of flooding create a situation where voters may be even more likely than they are in other contexts to prefer targeted flood assistance.

4. Empirical strategy

We test our hypotheses in stages, with each component of the analysis shedding partial light on our object of investigation. We first seek to establish a link between flooding and clientelism in Honduras with data from the 2018 Latin American Public Opinion Project survey fielded just under a year after the November 2017 general election.

Next, we analyse the impact of flooding on aggregate-level results for municipal (mayoral) elections held in 2017 and 2021 using a difference-in-differences approach, following the strategy used by [Gallego's \(2018\)](#) study of floods and clientelism in Colombia and [Cooperman's \(2022\)](#) study of the politicization of drought relief in Brazil. The aim of this analysis is to confirm the expected relationship between flooding and electoral outcomes, and to extend it to the multiple disaster context of the 2021 election, for which relevant survey data are not available. If clientelism is an effective electoral strategy, this will lead to higher levels of electoral support for parties that engage in it. We posit that flooding offers an additional opportunity to practice clientelism: in flooded areas there ought to be a vote share boost for the party best-placed to engage in flood-related clientelism, *ceteris paribus*.

Finally, we further explore plausible causal mechanisms by means of semi-structured elite interviews conducted shortly after the 28 November 2021 election, which occurred while the COVID-19 pandemic was ongoing, approximately a year following the storms Eta and Iota that battered Honduras between 3 and 18 November 2020. Together, these research strategies allow us to gain a good understanding of how flooding shapes clientelist exchange in Honduras.

4.1. Quantitative analysis

We first analyse individual-level survey data, available for the 2017 election. The Latin American Public Opinion Project (LAPOP) AmericasBarometer surveys, fielded across a wide range of Latin American countries approximately every two years for the past 30 years, provide a useful source of data to examine the relationship between flooding and clientelism, as they have asked questions on the experience of both phenomena in Honduras.¹ Question coverage is not uniform across survey series and the only recent study including questions on clientelism and flooding is from 2018. The questionnaire included two items designed to tap clientelism for the 2017 election:

Thinking of the last national elections, did any candidate or political party offer a favor, gift or other benefit to a person whom you know in exchange for that person's support or vote?

And thinking about the last presidential elections of 2017, did someone offer you something, like a favor, gift or any other benefit in return for your vote?

The first question is general, and indirect, asking about others rather than about the respondent personally. The second question is more direct and specifies clearly that there is an exchange of benefits for votes. We use both items. Evidence from list experiments suggests that direct questions such as these most likely undercount clientelism due to desirability bias ([Gonzalez-Ocantos et al., 2012](#); [González-Ocantos, Kiewiet de Jonge, and Nickerson 2015](#)). This is therefore a conservative measurement strategy, and if we find a link between responses to these questions and the experience of flooding, we can anticipate that our results under-estimate the true magnitude of this effect.² The strategy is also conservative as some respondents may not recall having received something for their vote the previous year.

The 2018 survey also asked about several different types of natural disasters that respondents might have experienced in the previous three years, including flooding:

I will mention some problems that many Hondurans have had to deal with in recent years. Which of these have you experienced personally, or someone in your home, in the last three years?

[...] floods.

An advantage of this item is that it generates a binary variable that aggregates flood experience over a number of years, decreasing the chances that idiosyncratic factors associated with individual flood events, or concomitant shocks arising from such events, might drive the results; it is likely for this reason to result in more consistent estimates of average effects over time ([Ramos and Sanz 2020](#)). A disadvantage is that the question asks about the period between the election and the survey (approximately eleven months), making it less precise than desired, but still sufficiently useful for our purposes. The risk is of Type II error rather than estimation bias: any results we do find are likely to underestimate the true effect.

In sum, the measures we employ are likely to result in under-estimation of the phenomenon under analysis; if we do find evidence, we may conjecture that the true relationship is stronger than what results suggest.

We are interested to know whether the experience of having been flooded in the previous three years increases the likelihood that respondents will report that they or someone they knew were offered something in exchange for their vote at the 2017 election. However, poorer voters, who are more often targeted with clientelism, are also more likely to live in places that are at greater risk of natural disasters such as flooding ([Wisner et al., 2004](#)). The geography of settlement could reflect distinct patterns of economic activity that are politically relevant; for example, those living near rivers and coastlines are more vulnerable to flooding, which might be correlated with political party support. We therefore use coarsened exact matching to pre-process the data prior to analysis in order to ensure that we are comparing voters

² Researchers have encountered problems implementing list experiments about clientelism in Honduras ([Meléndez 2014: 9](#)), suggesting that a direct question such as the one we employ is probably the most reliable technique in this context. We also note that list experiments can result in high levels of measurement error ([Blair et al., 2019](#); [Blair et al., 2020](#)). The measurement of anything covert such as clientelism is fraught with difficulty, but from the point of view of casual identification, what matters here is that there is little reason to believe that such measurement issues might be systematically linked to the geographic distribution of flood experience, and no reason to believe that survey respondents would knowingly dissemble in answering the LAPOP question about flooding.

¹ Details of survey methodology and question wording are in section 1 of the Supplementary Materials.

who experienced flooding with voters who did not experience flooding but lived in similar settings.³

In this analysis we include all respondents, as flooding can be expected to have displaced some residents from the places they lived. Nevertheless, most residents will most likely have remained in roughly the same locations. For this reason, the variables on which we match might systematically vary between flooded and non-flooded areas, and are relevant to clientelism. At the aggregate level, these include the proportion of poor people who lived in a given municipality and vote for the incumbent (Nationalist Party) president at the previous (2013) election. At the individual level, we match on education, subjective economic situation, rural residence and ethnicity. Full details of variable construction, our matching strategy and balance tests, can be found in sections 1 and 2 of the Supplementary Materials.

Following matching, we analysed the data via regression models including both individual and aggregate-level controls to account for the possible residual effect of our matching variables on the dependent variable, and also variables which we had little reason to believe might be unevenly distributed between flooded and unflooded areas.

These models take the general form:

$$\Pr(E_{ij} = 1 | x_{ij}) = f(B_0 + \gamma F_{ij} + \beta x_{ij} + \delta z_j + \varepsilon)$$

where E is the reported experience of clientelism of respondent I in municipality j , F is reported flood experience, x_{ij} is a vector of individual-level covariates, z_j is a vector of aggregate-level covariates and ε is an error term. We employ generalized linear models with a logistic link function and generalized linear mixed effects logistic models.

We also leverage the occurrence of floods which took place while the survey was in the field to deploy an Unexpected Events During Survey design (UEDS) to check the robustness of our survey-based findings.

Next we analyse aggregate-level results for municipal (mayoral) elections held in 2017 and 2021 using a difference-in-differences approach implemented via two-way fixed effects which estimates the average treatment effect on the treated (ATT) via regressions that take the general form:

$$Y_{it} = \tau F_{it} + \gamma_i + \delta_t + \beta x_{it} + \varepsilon_{it}$$

where Y_{it} is the vote share for a given party in municipality i at time t , τ is the parameter of interest (the ATT), F_{it} is the proportion of flood-affected residents in municipality i at time t , γ_i is a unit (municipality) fixed effect, δ_t is an election year fixed effect, x_{it} is a vector of covariates that take account of potential differences in trends, and ε_{it} is an error term. This strategy controls for unobservable confounders across both space and time so as to isolate the impact of flooding on electoral outcomes. Standard errors are clustered by municipality and year.

We include only municipalities that are at risk of flooding, defined as municipalities that had experienced flooding at some point between 1995 and 2015. Literature on the electoral effects of natural disasters has found that effects tend to be associated only with disasters that have taken place in the previous year to the election (Birch 2022; Cole et al., 2012). Accordingly, our criteria for the inclusion of floods in the aggregate-level analysis are: events affecting at least 10,000 people that occurred within one year of the start of the three-month general election campaign period. Since elections are in November, coinciding with the autumn storm season, this effectively means floods in the current and the previous seasons. According to the United Nations Office for the Coordination of Humanitarian Affairs' reliefweb.int listings of natural

disasters, three flood events meet these criteria: one in the lead-up to the 2017 election and two in advance of the 2021 election.⁴ Widespread flooding occurred between 23 and 29 October 2017, a month before the 26 November election, and affecting approximately 40,000 people in 30 of Honduras's 298 municipalities, mainly in the north and center, prompting the establishment of a special presidential commission (see Fig. 1).

In the second period, two major hurricanes, Eta and Iota, struck Honduras in early- and mid-November 2020, almost exactly a year before the 28 November 2021 election, causing significant damage and directly affecting over four million people (nearly half the country's population) in 187 municipalities. The Eta-Iota duo was the most devastating storm in Honduras since the destruction of Hurricane Mitch in 1998 (see Fig. 1). These storms coincided with the COVID-19 pandemic, which had by the 2021 election led to the deaths of over 10,000 Hondurans, approximately 1 in 1000 of the country's population. In the 2021 analysis we control for COVID deaths per million inhabitants.

We include additional controls to capture electorally-relevant aspects of inter-electoral change that might be correlated with flooding. These include variables designating two main salient issues in Honduran politics: economic development, proxied by the proportion of households in each municipality that were supplied with electricity in the relevant year; and physical security, indicated by homicides per 100,000 residents in the year in question.

We follow Masiero and Santarossa (2021) in matching the data on the two socio-economic control variables (via Coarsened Exact Matching), prior to implementing difference-in-differences analysis.

4.2. Qualitative analysis

To supplement and contextualize the quantitative analysis, we carried out 12 online interviews with experts on Honduras between 22 March and 9 May 2022. Our interviewees included academics, think tank experts and several working for national, international civil society organizations. Our sample were mostly from Honduras, but also included other nationals with Honduran expertise. Most of the questions focused on how clientelism works in Honduras, with the final questions asking about the clientelization of disaster relief and reconstruction aid in the wake of tropical storms. The interviews were conducted in Spanish and anonymized following transcription. They are referred to in the text by number. The full interview schedule, interviewee list and methodological details are included in the Supplementary Materials.

While individually none of the three analytic tools we employ enables a complete test of our hypotheses, we rely on the principle of triangulation and anticipate that results from several different methodological approaches that all point in the same direction will enable us to have a greater degree of confidence in our conclusions.

5. Results

Our interviews are a rich source to support our first hypothesis that disaster relief resources are clientelized in the wake of floods in Honduras.⁵ Interviewee #7, an academic with fieldwork experience in Honduras and Latin America, stated "there are limited resources to reach all the affected population, but when resources are distributed, there is

³ Coarsened exact matching (CEM) is a non-parametric technique designed to produce balanced treatment and control groups by matching on a set of variables that have been 'coarsened' by being binned into a range of user-defined categories and matched on the basis of cases with the same values on the coarsened versions of the variables. Cases that cannot be matched are discarded (Iacus et al., 2012).

⁴ This newsfeed included information from a variety of sources, including official Honduras government briefings. This information was cross-checked against the floods reported on the [floodlist.com](https://www.floodlist.com) website, a specialist site devoted to the monitoring of floods globally.

⁵ We are only able to present a fraction of the relevant material here. Section 6 of the Supplementary Materials contains additional interview material, including comments made by several of the interviewees on the lasting legacy in Honduras of 1998 Hurricane Mitch.

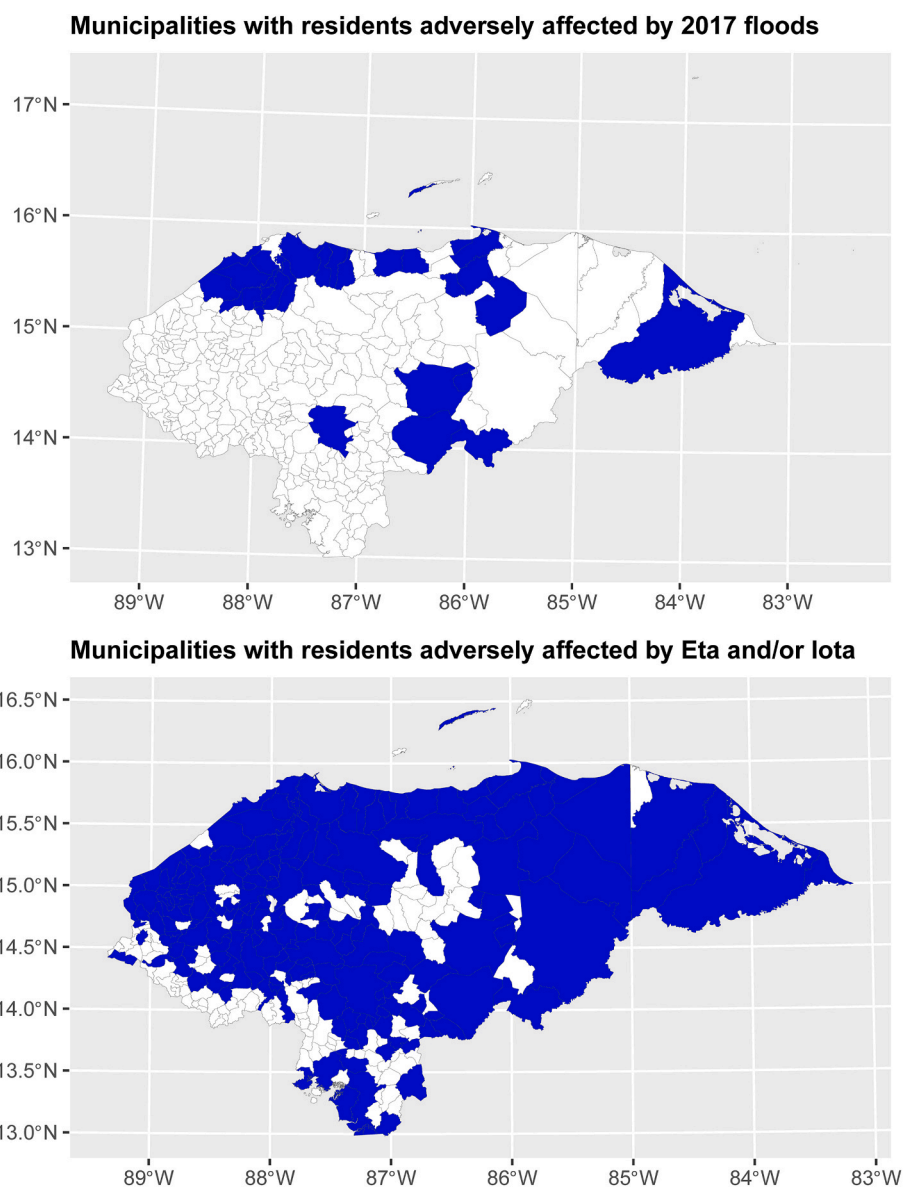


Fig. 1. Flood events by period.

political bias”. Interviewee #6, an investigative reporter, said: “this type of help is oriented to people from the same party”.

The frequency of flooding in Honduras suggests that if flood relief is being instrumentalized as a clientelist resource, as our theoretical expectations suggest, this practice is institutionalized; in other words, party operatives expect to use this tool to mobilize voters, and their clientelist machines are set up to do so. Interviewee #7 confirmed this bluntly: “natural disasters are like an opportunity. Political parties see it like this: ‘there has just been a natural disaster, but this is an opportunity. We need to demonstrate our closeness [to voters], our solidarity, but also our control of territory’”. Interviewee #4, an international consultant based in Honduras, expressed a similar view: “The provision of humanitarian assistance, in the end has been justified as an exchange, to ingratiate themselves with communities and to buy votes, basically, but then this massive provision given out before an election has in floods a justification, basically it hides a clientelist practice under the pretext of real humanitarian assistance.” Interviewee #11, a national with executive responsibilities in an international NGO with a program in Honduras, concurred, stressing the local nature of clientelist ties: “In the end, storms become fertile ground for parties, but also above all for local

leaders, for mayors.”

To test this relationship systematically, we start with the individual-level survey analysis. Although flooding and clientelism were reported by a minority of the 2018 LAPOP sample analysed, both were sufficiently widespread to generate a broad distribution of respondents, as shown in Table A4. The bivariate data indicate that respondents reporting having been flooded were between eight and ten percent more likely to report being aware of or experiencing clientelism, consistent with our conjecture the flood relief was clientelized in the 2017 election.

Turning to multivariate analysis, we employ logistic regression and mixed effects (multilevel) models on matched data to estimate the impact of flood experience on clientelism in the 2017 Honduran election. Concurrent elections are held in Honduras every four years, and the poll held on 26 November 2017 elected the president, parliament and local government officials. Although high rates of unemployment and the prevalence of corruption and organized crime during the previous regime were major election issues (Gonzalez Tule and Rodriguez 2020), the incumbent National Party was declared to have won the presidency, a strong plurality of parliamentary seats, and control of most municipalities. We focus on the late 2017 flood event described above.

Table 1
Models of the impact of flood experience on clientelism.

Dependent variable	Model 1 [♦]	Model 2 [♦]	Model 3 [◆]	Model 4 [◆]
	C1	C2	C1	C2
Independent variables: individual-level				
Flood experience	.419* (.192)	.516** (.195)	.406* (.197)	.494* (.198)
Age	-.026*** (.005)	-.026*** (.005)	-.026*** (.005)	-.027*** (.005)
Sex	-.194 (.139)	-.172 (.143)	-.192 (.145)	-.151 (.148)
Education	-.006 (.019)	-.021 (.020)	-.007 (.020)	-.021 (.021)
Ethnicity	-.345 (.230)	-.337 (.236)	-.389 (.240)	-.375 (.245)
Subjective economic situation	-.165 (.092)	-.303** (.097)	-.142 (.096)	-.292** (.101)
Bono 10,000 recipient	.146 (.201)	-.128 (.213)	.202 (.211)	-.083 (.220)
Rural residence	-.106 (.170)	-.085 (.173)	-.047 (.187)	-.058 (.186)
Independent variables: aggregate-level				
Proportion of poor residents in municipality	1.171 (1.021)	-.768 (1.045)	.777 (1.360)	-.779 (1.305)
Municipal-level vote share of the incumbent president at the previous election	-.012 (.010)	.003 (.010)	-.011 (.013)	.006 (.012)
Constant	.035 (.589)	.971 (.614)	.142 (.711)	.898 (.693)
Random intercept variance component			.060 (.246)	.023 (.150)
AIC	1095.2	1058.2	1194.2	1155.6
Obs (Individual-level)	1247	1247	1247	1247
Obs (Macro-level)	44	44	44	44

Notes: The dependent variable labeled 'C1' reflects affirmative answers to the question: "Thinking of the last national elections, did any candidate or political party offer a favor, gift, or other benefit to a person whom you know in exchange for that person's support or vote?". The dependent variable labeled 'C2' reflects affirmative answers to the question: "And thinking about the last presidential elections of 2017, did someone offer you something, like a favor, gift or any other benefit in return for your vote or support?". ♦ This is a generalized linear model with a logistic link function; cell entries are coefficients (standard errors). ◆ This is a generalized linear mixed effects (random intercepts) model with a logistic link function; cell entries are coefficients (standard errors).

* = $p > .05$; ** = $p > .01$; *** $p > .001$.

As controls we include standard individual-level demographic variables including sex, age and socio-economic variables expected to be associated with vulnerability to clientelism such as education level, subjective economic situation and ethnicity.⁶ We also include whether respondents benefited from the Bono 10,000 program conditional cash transfer program designed to serve Honduras's neediest residents. The program is known to be affected by politicized targeting those who receive this benefit may for this reason be more likely to report clientelist experiences (EUEOM, 2014:9; Meléndez, 2014; cf Taylor-Robinson 2009, 2010: 183-4). In fact, several interviewees mentioned that receivers of some social programs were being clientelized. For example, interviewee #3, a Honduran national with executive responsibilities in an international NGO with a program there, stated: "There is evidence of quite sophisticated clientelist practices. (...) They are related with the delivery of specific social programs addressed to electoral audiences aimed to vote to those in power". We also include the proportion of poor residents in a respondent's municipality, as well as municipality-level vote for the incumbent president at the previous (2013) election. Table 1 presents results of logistic and mixed-effects models for both indicators of clientelism.

Having experienced flooding in the previous three years is associated with a greater likelihood of respondents reporting having been personally offered something for their vote (Models 2 and 4), but a somewhat less pronounced likelihood that they give an affirmative response to the more general clientelism question (Models 1 and 3). Flood experience is significant at the 0.008 level in Model 2 and at the 0.012 level in Model 4, whereas this variable is significant at 0.029 and 0.039 in Models 1 and 3 respectively.

As the predicted probabilities in Fig. 2 show (based on Model 4), flood experience is associated with an increase in the likelihood of being personally targeted with clientelism from just under a quarter to a third, a substantively important change. The interview evidence is similar; when we asked interviewees whether they knew whether economic or material help had been offered in exchange for votes after the floods, responses were unanimously affirmative. These findings offer support for H1, the expectation that floods should be linked to clientelism.

⁶ We do not include partisanship, as this can be an effect of clientelism (Diaz-Cayeros et al., 2016).

An additional analysis deploying an Unexpected Events During Survey (UEDS) design (Muñoz et al., 2020), presented in Section 5 of the Supplementary Materials, exploits floods that occurred during the period of survey fieldwork in a small number of geographic areas but with national media coverage to discount the possibility that contemporaneous priming effects account for respondent reports of their experience of clientelism.

We next turn to the aggregate data analysis. As noted, we are interested in the impact of flooding on electoral results, as successful clientelism can be expected to boost support for parties that engage in it. The results of the 2017 analysis are presented in Table 2.⁷ We include models with flooding per capita and with flood relief per capita. The 2017 floods benefited the Liberal Party but had no evident impact on the vote share on the National or Libre parties. In the context of the 2017 race, this stands to reason, since that year the northern part of the country suffered most from flooding, and the prosperous northern littoral is a Liberal Party stronghold. This is consistent with (though not definitive proof of) the expectation that flooding impacted on vote share. Flood relief is not significant in any of these models. As noted, the flood relief indicator used is aid given by COPECO, Honduras's national disaster agency, and these data do not include the allocation of other resources at the discretion of local mayors. It is logical to assume that the Liberal Party, in opposition at national level, was not able to skew the distribution of national-level assistance to their advantage, and instead used other resources as clientelist goods at this time. Given the location of the 2017 flooding, these findings provide additional support for H1 – the overall impact of storms on electoral support. Table A6 in the Supplementary Materials includes models in which the vote share of the party in power in each municipality is the dependent variable. In these models, this variable is not in any case significant. This indicates that it was not local incumbency alone that was relevant in this context, but local incumbency together with non-clientelistic characteristics of the different parties, which can be expected to include disaster performance; negative disaster performance evaluations of the National Party may

⁷ Pretests for parallel trends are shown in Table A5 of the Supplementary Materials. These show that the 2017 floods had no significant impact on the 2013 election results, and that the 2021 floods had no significant impact on the 2017 election results.

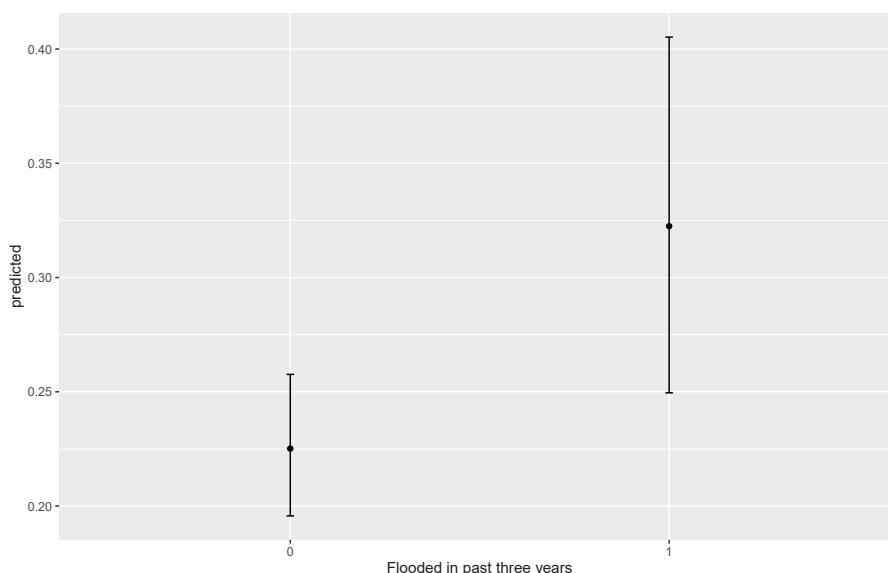


Fig. 2. Predicted probability of reporting having been offered something in exchange for one's vote, by flood experience.

Table 2

Aggregate-level models of the impact of flooding and flood relief on municipal electoral results, 2013–2017.

	National Party		Liberal Party		Libre Party	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% affected by flooding	-1.561 (.095)		3.997** (1.482)		-2.101 (1.365)	
% aided by flood relief		-4.188 (7.154)		8.571 (11.278)		-5.496 (10.193)
Unit fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Election fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs (municipalities)	120	120	120	120	120	120

Notes: The dependent variable in each model is the vote share of the party listed in the column heading. Cell entries are coefficients (standard errors); * = $p > .05$; ** = $p > .01$; *** $p > .001$. Standard errors are clustered by municipality and year, and adjusted for sample size.

well have cancelled out any clientelist benefit that party derived from flooding in municipalities it controlled.

The multiple disaster of 2020-21, when Honduras had to cope with a deadly pandemic and two devastating hurricanes, led to widespread effects across the country, with poverty rising from 40.1 percent in 2019 to 54.0 percent in 2021 (Instituto Nacional de Estadística, 2021).

According to the logic of clientelism, COVID-19 could potentially have represented an opportunity to reinforce the link between party and voters: as new funds became available to address the health emergency, this increased opportunities for political actors to exert discretionary control over resource allocation, as suggested by H2a. Interviewee #3 affirmed that opportunities were opened by the hurricanes: “the storms that occurred, the tropical storms, etc., constituted an opportunity to feed clientelistic design in the sense that they allowed the use of extraordinary resources almost always under exceptional methods, methods of exception in the purchasing and contracting system. It gave you more money in very short terms without control and transparency mechanisms”. And: “As we also saw in the COVID period, it was the same. The debt was extended to almost \$2500 million and the execution of that debt was given in an opaque or discretionary manner.”

However, our interviewees also suggested an alternative scenario, hypothesized in H2b, whereby the hurricanes and COVID had a negative effect due to the extreme pressure the disasters placed on clientelist networks. There are several such elements that emerge from the interviews. The first is that when funds and the fiscal capacity of the state are rather limited, the allocation of funds has to be more selective as there are fewer resources available. Interviewee #3 recognized that in 2021 the country faced the situation “(.) with little money”.

The second factor is lack of preparedness. The COVID-19 pandemic was one that no state anticipated. But Honduras could have been expected to be better adapted to the risk of hurricanes. As interviewee #5, an expert on transparency in political and electoral financing in Honduras and Latin America, stated: “Eta and Iota were, I think, like the straw that broke the camel’s back for some. Because, if we know that we are a tropical country, because if we know that storms hit us, all this will happen to us [i.e. storms can be anticipated]”

Third is the impact of the multiple disasters on the economy. Interviewee #7 said that “the pandemic came to further sink the country and hurricanes Eta and Iota, which obviously destroyed much of the productive structure”, while #10 stated “the blow to tax revenues in the country was very strong. Obviously, this reduces the capacity of the state to obtain resources for patronage purposes.”

A fourth element is government response, in terms of speed and the amount of help provided. On the former, interviewee #2, a Honduran political analyst, said: “Note that with Eta and Iota I felt a late reaction. I don’t know if it was due to the effect of the pandemic. (...) Even at the last minute the government was asking for a lot of help. I would dare to say that the pandemic had quite reduced institutional response capacity.” An additional argument was provided by interviewee #5 when explaining that “the state tried to offer a supply of some goods to calm the need, to try to meet the needs of the people, but I get the impression that the supply of goods did not meet the demand [...] The state did not have the capacity to deliver resources to all who were affected and also to maintain the financial sustainability of the clientelist networks that existed”.

In sum, our interviews suggest a negative effect of both the

Table 3
Aggregate-level models of the impact of flooding and flood relief on municipal electoral results, 2017–2021.

	National Party		Liberal Party		Libre Party	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% affected by flooding	-.006 (.039)		-.018 (.062)		.053 (.057)	
% aided by flood relief		.041 (.514)		-.018 (.062)		-.612 (.760)
COVID deaths per million	-.004* (.002)	-.004* (.002)	-.0002 (.003)	-.0002 (.003)	.004 (.003)	.004 (.003)
Unit fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Election fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs (municipalities)	119	119	119	119	119	119

Notes: The dependent variable in each model is the vote share of the party listed in the column heading. Cell entries are coefficients (standard errors); * = p > .05; ** = p > .01; ***p > .001. Standard errors are clustered by municipality and year, and adjusted for sample size.

Table 4
Aggregate-level models, 2017–2021, disaggregated by flood-affectedness.

Flood-affected municipalities						
	National Party		Liberal Party		Libre Party	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% affected by flooding	-.015 (.044)		.003 (.069)		.028 (.065)	
% aided by flood relief		-.086 (.582)		.931 (.908)		-1.126 (.858)
COVID deaths per million	-.004 (.002)	-.003 (.002)	-.004 (.003)	-.004 (.003)	.006† (.003)	.006† (.003)
Unit fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Election fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs (municipalities)	72	72	72	72	72	72
Non-flood-affected municipalities						
	National Party		Liberal Party		Libre Party	
	Model 7		Model 8		Model 9	
COVID deaths per million	-.007† (.004)		.011† (.006)		.0006 (.005)	
Unit fixed effects	Yes		Yes		Yes	
Election fixed effects	Yes		Yes		Yes	
Demographic controls	Yes		Yes		Yes	
Obs (municipalities)	41		41		41	

Notes: The dependent variable in each model is the vote share of the party listed in the column heading. Cell entries are coefficients (standard errors); † = p > .10; * = p > .05; ** = p > .01; ***p > .001. Standard errors are clustered by municipality and year, and adjusted for sample size.

hurricanes and the pandemic which undermined the ability of incumbent political actors to allocate resources in the usual manner.

The models in Table 3 probe the electoral consequences of this situation. In line with what our interviewees told us, it does not appear that any political party was able to exploit for electoral benefit either the devastation wrought by hurricanes Eta and Iota or the health stresses of COVID-19. Indeed, the presidential incumbent party, the National Party, gained fewer votes in municipalities that suffered more COVID deaths, as shown in Model 1. This model shows no effect of flooding or flood relief on their own, suggesting that at this point the electoral cycle, the ongoing pandemic may have been a greater concern to voters.

This is in stark contrast to the results from the ‘usual’ disaster year of 2017, which showed the Liberal Party reaping the benefits of flooding in areas it controlled. These results offer support for H2b, namely that parties should struggle to take electoral advantage of disasters when the impact of these events is unusually severe.

Additional insight into the ‘COVID effect’ can be gained by disaggregating the matched dataset into municipalities that were flooded in 2020 and matched municipalities that were in flood risk areas but were spared by Eta and Iota. The models in Table 4 show that in flood-affected areas, the vote share for the challenger Libre party rose where COVID-19 levels were higher, whereas in areas not affected by flooding it was the

traditional opposition Liberal Party that benefited from the pandemic and the National Party that suffered. The diminished number of observations in these models likely accounts for the fact that these coefficients are only weakly significant,⁸ but it is noteworthy that the COVID coefficient in the Libre party model (Model 9) is far from being significant, suggesting that the electoral impact of COVID was fundamentally different in flooded areas from its effect matched non-flooded areas.

A widespread disease outbreak is much harder for parties to exploit via clientelist means than a flood, as benefit-targeting is far more challenging. Everyone was at risk of COVID, and all communities were in some way affected by the repercussions of the pandemic. In this context, it is not surprising that the ruling National Party lost votes in 2021, as the same fate befell many parties around the world in elections held during this period. What is interesting about the Honduran case is that in areas affected by COVID alone, voters opted disproportionately for the traditional opposition Liberal Party, whereas in municipalities that had suffered the effects of two major hurricanes the previous year in addition to the devastation wrought by COVID, it was the challenger Libre party that managed to break the century-long party duopoly and win support. Libre’s ultimate electoral victory suggests that repeated severe disasters can reshape politics in unexpected ways, and that these effects are qualitatively different from the electoral impact of isolated extreme

⁸ The coefficient in Model 5 is significant at the 0.08 level, that in Model 6 is significant at the 0.06 level, that in Model 7 is significant at the 0.08 level and that in Model 8 is significant at the 0.07 level.

weather events.

6. Discussion and conclusion

This study contributes to our understanding of how extreme weather affects an important type of electoral manipulation – clientelism. There is comparative work indicating that the quality of institutions shapes the extent to which leaders can effectively protect their citizens from natural disasters (Persson and Povitkina 2017). This study has provided evidence of the likely mechanism behind this relationship. The findings of the quantitative and the qualitative analysis indicate that the use of disaster relief for clientelistic purposes is deeply entrenched in Honduran politics. The regularity of tropical storms and attendant flooding, often shortly before the regular November elections, has made available to political actors a ready source of goods that can be mobilized in exchange for votes, and it appears that this has resulted in a ‘flood industry’ analogous to the ‘drought industry’ that has developed in Brazil (Cooperman 2022). Our first hypothesis, H1, is therefore supported. However, the severe disasters of hurricanes Eta and Iota, which struck Honduras in quick succession in 2020 at a time when the impoverished country was reeling from the COVID-19 crisis, suggest that there may be limits to the ability of political parties to benefit electorally from the instrumental use of disaster relief. Though there is no survey data available to explore this effect in detail, the available evidence points to the conclusion that when disaster has effects that are too large and client need is too great, parties fail to meet the demands of their base, as suggested by H2b. Our interviews indicate that this is one of the reasons for the defeat of the two parties that have between them ruled Honduras since the 19th century. The disaster-affected 2021 election was thus a case where backsliding failed to materialize.

As climate change raises the incidence of extreme weather events, floods, storms, droughts and other natural disasters will increasingly shape social life, especially in underdeveloped countries. Our findings shed important light on how the changing climate is conditioning electoral processes: disasters of ‘usual’ magnitude can be harnessed by clientelist parties for electoral ends, but unexpectedly large and complex disasters may overwhelm the ability of clientelist machines to operate effectively for large sectors of the electorate. These are theoretically-relevant findings, as the experience of several disasters in a short period of time can be expected to be increasingly frequent as the climate changes and weather extremes become more common.

Future research could usefully extend this analysis to a wider number of countries. It would also be fruitful to consider the impact of extreme weather events on normative attitudes toward clientelism. As the climate changes, more and more countries will be confronted with severe and overlapping disasters of the type that affected Honduras in 2020–2021. The effects of such events on clientelism and other informal institutions is therefore an area where much research remains to be done.

Declaration of competing interest

None.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.electstud.2023.102651>.

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