

Disaster-Related Food Security and Past General Governance Strategies in a Worldwide Sample

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ABSTRACT: Climate change is an increasingly pressing concern because it generates individual and societal vulnerability in many places in the world and also because it potentially threatens political stability. Aside from sea level rise, climate change is typically manifested in local temperature and precipitation extremes that generate other hazards. In this study, we investigated whether certain kinds of governance strategies were more common in societies whose food supply had been threatened by such natural hazards—specifically, floods, droughts, and locust infestations. We coded and analyzed ethnographic data from the Human Relations Area Files on 26 societies regarding dominant political, economic, and ideological behaviors of leaders in each society for a specified time period. Leaders in societies experiencing food-destroying disasters used different political economic strategies for maintaining power than did leaders in societies that face fewer disasters or that did not face such disasters. In nondisaster settings, leaders were more likely to have inward-focused cosmological and collectivistic strategies; conversely, when a society had experienced food-destroying disasters, leaders were more likely to have exclusionary tribal/family-based and externally focused strategies. This apparent difficulty in maintaining order and coherence of leadership in disaster settings may apply more to politically complex societies than to polities governed solely at the community level. Alternatively, it could be that exclusionary leaders help set up the conditions for disastrous consequences of hazards for the populace. Exceptions to the pattern of exclusionary political economic strategies in disaster settings indicate that workarounds do exist that allow leaders with corporate governance approaches to stay in power.

SIGNIFICANCE STATEMENT: Our goal was to explore how leaders have governed over the past two centuries when they live in places where food-destroying disasters occur versus more stable settings. Results from a sample of 26 different societies located globally in variety of geographic areas showed that disaster-affected places had leadership efforts that were more exclusionary. For example, leaders were more nepotistic, favored their own survival over that of their people, or shared power less. This matters because people want leaders to respond to their needs in disasters, but these leaders may not want to do so or may find it hard to do so. It may also be that exclusionary leaders help to create disasters through lack of planning. Results suggest a need for further examination of specific mechanisms generating this association.

KEYWORDS: Social Science; Drought; Flood events; Freeze events

1. Introduction

Climate change can increase the intensity or extremeness and the frequency of natural hazards—like droughts, floods, heat waves, precipitation/storms, and wildfires and even cascading or compound hazards—across the globe that in turn can increase individual and societal vulnerability (Duffy and Tebaldi 2012; Kunkel et al. 2013; AghaKouchak et al. 2020). Susceptibility to climate change risks also tends to be geographically distributed. Societies in Arctic conditions, mountainous regions, coastal or low-lying regions, and pastoral habits, are for instance, at higher risk of experiencing climate-induced impacts to their food security (Roncoli et al. 2009; FAO 2015). A hazard can lead to disastrous consequences for humans, so we typically say that a disaster is created by a hazard plus vulnerability of humans, their livelihoods, or built infrastructure (Cannon 1993). Vulnerability

increases not only due to change in magnitude of events generated by changing meteorological patterns, but also in part because the timing and location of these extreme and rapid changes can catch leaders and their subjects off guard or off balance. Vulnerability is created by society, which means our ways of living plus leaders' governance practices can put people in harm's way. Hazards that are catastrophic and accompanied by failure of crop productivity and famine (herein, food-destroying disasters) are particularly challenging to leaders because humans rely heavily on one another and thus social processes for access to food. Food insecurity, the rise of new epidemics, loss of livelihoods, exacerbated social inequalities, as well as the overall human death toll—are all upshots of food-destroying disasters. This study is not about climate change but is a novel study about governance amid food-destroying disasters generated by weather hazards in over two dozen societies at different points in the last two centuries around the globe. But climate change will make these issues of governance and food access all the more important in coming years. Contemporary

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studies have evinced the importance of governance in enabling climate adaptation policies and programs for agriculturalists (e.g., farming smallholders) most vulnerable to climate variability's impacts. In particular, research supports government engagements with farmers to codesign and implement context-appropriate, asset-provision support (e.g., microcredit schemes, funding farming necessities, economic incentives, and subsidies) (Mertz et al. 2009; Harvey et al. 2018). Other mechanisms include helping farmers adopt alternative farming approaches such as ecosystem-based approaches (Harvey et al. 2018), vulnerable-smart agriculture (Azadi et al. 2021), or livelihood diversification (Yamba et al. 2019).

Despite the above, there are almost no cross-cultural studies examining the relationship of leadership strategies to food-destroying disasters. While vulnerability is generally the focus of disaster studies (see Faas 2016 for review), some case studies give attention to variation in the ways governments act or in the ways politics is related to hazards and disasters (e.g., Pelling and Dill 2010; Olson and Gawronski 2003; see review by Jones and Murphy 2008). Other studies document people's dismay at the callousness, corruption, bias, cynicism, or incompetence that leaders have shown in the face of hazards and their disastrous aftermaths (e.g., Schuller and Maldonado 2016; Barrios 2017; Gamburd 2013; Zhang 2016; Jones et al. 2018). Particularly cogent to our humanitarian sensibilities are studies about food insecurity arising from meteorological events coupled with variation in the effectiveness of governance (e.g., Oliver-Smith 2009; Ainehvand et al. 2019).

Such studies often include not only the perspective that leaders are poorly coordinated or are willfully indifferent or negligent, but also that leaders are often operating from the perspective of governmentality—of trying to control people so that, in general, the people are easier to help and/or easier to lead (Sökefeld 2012; Foucault and Sheridan 1991). We feel that these concerns about governmentality and shoddy governance in the field of disaster studies should be conceptualized within a broader vulnerability framework about disaster cause and consequence that takes into consideration dependence on natural resources and particularly food security (e.g., Marino 2015). While risk and disaster governance has received attention by scholars with particular concern about uncertainty (e.g., Fra-Paleo 2015), systematic cross-cultural work is much less common, especially work that focuses on food security. We think our exploratory comparative study on food-destroying disasters in 26 societies help build upon some of these insights regarding *why leaders often are not as helpful or responsive to the public in the way many people, scholars and activists think they should be—particularly when food and livelihoods are involved*. We hypothesize that there are strategies that leaders use to provide coherence in their maintenance of power that produce variation in their responsiveness to the plight of the common people in disasters. This research is about leadership behaviors, not full societal response. Societal response is more complicated and requires examination of the relationship between the governing and the governed, which ebbs and flows and varies from case to case in the same society even when the disaster cases seem very similar. We hope to conduct such

research in the future, but it is important to take this initial step toward such comprehensive research.

By evaluating quantitatively and qualitatively how leaders in over two dozen societies around the world have acted at some point in the past two centuries in the context of natural hazards that turned into food-destroying disasters—although not yet examining success or failure nor the mechanisms for success or failure—fundamentally we seek insight into how influential elites and political leaders of societies in the future might be likely to respond to these environmental challenges or even exacerbate their impacts. Commoners or subjects often expect leaders to help them recover from disasters and may even blame leaders for a natural hazard turning into a disaster and unexpected or unwarranted human tragedy. However, the goal at this early stage in this vein of research is not to investigate how leaders try to protect society from the potential consequences of natural hazards. Rather, our goal is to examine the ethnographic record for how leaders have developed or adapted their political economic strategies in order to maintain their legitimacy in contexts where food-destroying disasters are problematic or relatively common versus not being much of a problem in their society. In two datasets of thousands of disaster situations around the world prior to the 1980s, Davis and Seitz (1982) found evidence for variation in disaster impact (deaths) by government effectiveness and stability, and Pelling and Dill (2010) referred to sociopolitical adaptation to the Turkey earthquake and hypothesized the process of political change resulting from disasters while highlighting the change-resisting roles of political culture and state traditions. This effort to understand the political economy of hazards and disasters [see the book of same title by Jones and Murphy (2009)] now requires a systematic cross-cultural approach.

a. *Political economic strategies of leaders*

Leaders employ many techniques for shoring up their power, and no less when faced with food-destroying disasters. For example, warfare is one practice of leaders consistently associated with food-destroying disasters. Ember and Ember (1992a) found that leaders use warfare to maintain access to resources when the biophysical environment tends to generate instability—particularly when hazards have affected food production—and thus perhaps affected confidence in leaders. However, frequently being involved in warfare is costly, so leaders using warfare will also be adopting strategies of diplomacy and internationalism/cosmopolitanism to cope with food depletions caused by natural hazards. Leaders might reach out to other societies for resources through peaceful means and through coercive means.

Focusing specifically on pre-Columbian Mesoamerican state-level archaeological cases though not specifically examining disasters, Blanton et al. (1996) showed across various geopolitical settings how a strategy of engaging leaders from other societies involves international trade in prestige goods to assure and to mark leaders' status and involves ideologically emphasizing family/ethnicity/tribe (i.e., taking care of one's own). The result is that commoners who are not tied to society's leaders are excluded from power and from access to some resources because of the leader's emphasis on kinship, ethnicity, allegiance, and

alliances. This is generally an *exclusionary strategy*—excluding people from the benefits of societal organization based on whether they have connections to the leader(s). We are not characterizing this set of behaviors as a type of society, per se, but as a generally coherent governance strategy employed by leaders that lies toward one pole on a continuum. Generally, toward this *exclusionary* pole of the governance continuum, leaders tend to exclude and include other people through kinship and ethnicity; leaders tend to seek resources—especially elite goods or preciosities—from others outside those boundaries and through royalties rather than through redistributing taxes on those inside their boundaries; and leaders are able to buttress their positions through these outside alliances, markets, conquests, or other connections.

However, other leaders—or even those same leaders at other points in time—opt toward a more inward-looking and collectivistic (i.e., *corporate*) strategy that lies toward the other pole of such a political economic continuum. In a relatively corporate strategy, governance coherence and societal order are maintained not through a leader's focus on kinship, elite goods, and access to foreign resources nor legitimacy conferred through association with foreign dignitaries, but through planned organization of food production and public works/services, through an ideology or belief system focused on keeping the cosmos in order, and generally through looking inward rather than through looking outward for solutions to resource problems.

The strategies of leaders to maintain their rule and their superior place in society are not necessarily always neatly classified in one of these two ideal polar suites of behaviors but fall along a continuum. Thus, this simple typology of exclusionary behaviors and corporate behaviors should not be seen as a reification of only two kinds of strategies. To be certain, leaders may move back and forth along the continuum or maintain facets of both at any given time. We thus coded societies' leaders at given points in time as employing generally exclusionary, relatively mixed, or generally corporate governance strategies. It is, however, *an empirical question* as to how much of what kinds of activities or suites of behaviors are actually employed by leaders.

Recent conceptual developments and facets of this corporate-exclusionary political economic governance framework have focused more narrowly on empirical research on political aspects of exclusionary leadership (e.g., [Peregrine 2008, 2012](#); [Peregrine and Ember 2016](#)), political aspects of collective action requiring corporate moral leadership and bureaucratic competency along with subjects' checks on power and their trust in government ([Blanton 2010](#)), and on sources of revenue for governance—particularly focusing on collective action resulting in redistribution ([Blanton and Fargher 2008](#); [Blanton 2015](#)). Additionally, the Blanton studies post-1996 have focused exclusively on state-level societies, have not considered disasters systematically, and were mainly concerned with the generation of collective action for the provisioning of public goods.

What is needed to help develop the field of disaster governance cross-culturally at this point is a general gestalt of what a coherent overall strategy (or one that might not be so coherent) looks like when leaders exert power in hazards and disaster

settings. We seek to employ the cross-cultural methodology to examine the general political economy of leadership in societies regardless of level of political organization—not just states but including bands and tribes without formal leaders. We include smaller-scale forms of political organization because we know that any human group larger than 6 always has needs to simplify competing and/or mathematically overwhelming combinations of potential relationships—a group of 6 has 966 potential social configurations ([Hallpike 1986](#)). Leaders often serve this simplification function within and between groups, especially concerning instances of conflict, competition, or some other problems requiring cooperation.

Some recent studies have examined governance strategies in a fashion similar to our own study in order to understand how such leadership is directly related to hazards and disaster settings. In a cross-cultural study of 11 societies, the exclusionary strategy was conceptualized as involving greater authoritarianism, leader aggrandizement and greater importance of external contacts, and was associated with the presence of more food-destroying disasters experienced by societies ($p < 0.04$; Pearson's $R = 0.54$) ([Peregrine and Ember 2016](#)). [Peregrine and Ember \(2016\)](#) and [Peregrine \(2017\)](#) further suggest that centralized responses may be more important for leaders trying to stay in power after a disaster. However, centralization as a political strategy to maintain power is not necessarily effective for the long term since participatory polities in the archaeological record tend to be more resilient to *major* disasters ([Peregrine 2018](#); $n = 33$) and other challenges to polity stability ([Feinman and Carballo 2018](#); $n = 26$; [Blanton et al. 2020](#); $n = 30$) than are nonparticipatory polities. Despite these advances, it appears that particularities of leader engagement in any culture of disaster (e.g., [Bankoff 2004](#)) as well as even the stability of political regimes of the last 5 decades are highly variable in the face of disaster (see review by [Jones and Murphy 2008](#)).

b. Study propositions

Delineated as follows are the general explanations we propose about general variation in the relationships between governance and disasters, based on economic focus of control, focus of ideology, and style of politics (after [Blanton et al. 1996](#)). These three domains help support a framework for our study, and below are the general focus of some propositions regarding disaster governance. Since this is an exploratory study, these are propositions as opposed to hypotheses.

- 1) Economic focus of control: *Food-destroying disasters may challenge leaders' abilities to support public economic infrastructure.* Maintenance of leaders' power in the face of frequent disasters may require greater reliance on family networks and access to wealth as well as less reliance on expectations that the common good can be maintained through roles and the production and distribution of public goods.
- 2) Focus of ideology: *Food-destroying disasters might be accompanied by leaders advocating kin-focused ideology rather than advocating beliefs that seek to maintain cosmological order.* Leaders with corporate strategies

use fixed cosmological ideologies that might not be appropriate in disaster-prone settings. When people are killed, it can be hard to justify that the life force or the gods willed it that way; it may be more psychologically palatable to emphasize kin and compatriots over social rules.

- 3) *Style of politics: Externally focused strategies could be more common in societies experiencing food-destroying disasters.* Unlike inwardly focused corporate strategies, leaders with exclusionary strategies specialize in diplomacy, warfare, and trade and would be able to draw upon resources of at least some neighbors or external contacts in a disaster context. Causality could be two ways—food-destroying disasters encourage an external focus for resources, and/or an external focus and neglect of internal needs results in hazards turning into disasters.

The objective of this study was to examine an aspect of the long-term interplay between human society and biophysical environments and is not designed to ascertain good versus bad governance outcomes. Blanton and Fargher's (2008) work on collective action posits conditions under which a government looks after the collective good, thus implicating both leaders and subjects. In this exploratory study on governance and disasters, we have focused on leaders' behaviors and not on subjects' behaviors or expectations.

2. Method

a. Definitions

For the purposes of this paper, we set some definitions in order to reduce confusion on the part of the reader, after Hoffman and Oliver-Smith (2002). An extreme event is an identifiable event that is magnitudinally out of the ordinary human experience. A hazard is an extreme event (whether acute or chronic) to which humans are exposed; natural hazards are geological or climatological extreme events to which humans are exposed. A disaster is a hazard with major consequences to human society; what is typically referred to as a natural disaster is a geological or climatological extreme event with major consequences to human society in terms of deaths, injuries, economic impacts, social and cultural behaviors, or well-being. There is nothing natural about a natural disaster—humans cause vulnerability (e.g., Cannon 1993), and thus we define natural disaster but do not use it in this paper. We use the term *natural hazard* for extreme events that come from the biophysical environment (e.g., floods, droughts, insect infestations), and we use the term *food-destroying disaster* (Ember and Ember 1992b) for those hazards causing food loss/insecurity.

Political economy, as discussed above, is the top-down behavior of leaders concerning the political, economic, and ideological realms accessible to them (e.g., Blanton et al. 1996; Jones 2010). Political economy might be considered as a subset of various approaches to governance, but we use governance strategies and political economic strategies synonymously in this study. We sometimes use the word "elite" in this paper to refer to formal leaders as well as to other powerful people in a society. When we use the word leader, we are being specific and

referring only to recognized political leaders described in the ethnographic excerpts that we coded.

b. Sampling

We examined governance strategies in 26 societies in specific historical time periods from the electronic Human Relations Area Files (eHRAF). The sample societies are listed in Table 1; they are diverse in location around the world and diverse in the level of complexity in political organization. They were selected because the disaster codes existed from Ember and Ember (1992b) for 98 of the 186 societies in the Standard Cross-Cultural Sample (SCCS)—a statistically random representative sample of the world's societies or polities for the past two centuries. Students in a methodology course were asked to pick societies from that list about which they were interested in learning more and added two societies not from the SCCS: Aleut and Cuna (now Guna). Those students began investigating those societies and finding ethnographic passages for coding, and the three authors then completed the coding. Thus, the authors did not bias the sample selection—however, the sample could be biased by the interests of the students who chose the societies for examination. Since around a dozen students chose the societies out of Ember and Ember's sample, we are not concerned with bias except perhaps for the exclusion of societies that speak national languages since the students may have interest in more unknown populations to them; thus, European societies and South American societies were probably overlooked by the students. And a look at the map (see Fig. 1) shows that the sample clusters within the tropics. Statistically, we indeed expect more representation in the subtropics and temperate zones than in the tropics because of high population density historically in India, China, and Europe. Although historians and folklorists have written (typically in other languages) about these populations, the English language ethnographies are typically based on where English colonizers or travelers ended up (and later, Americans and British and other ethnographers publishing in English language books and journals). This study is indeed biased by the fact that it relies on ethnographies in the English language. However, again, the SCCS from which these societies were drawn was created to be a sample representative of the world's thousands of societies in a way that would control for Galton's problem of diffusion or linguistic relatedness. Each society that we read about and coded had its own specific focal date in the past 200 years [from 15 years prior to the focal date up to 10 years after the focal date, as per Ember and Ember's (1992b) method], with just over one-half of these societies being described by ethnographers in the early twentieth century (Table 1).

It might be argued that the differing levels of political organization in the sample are so different as to not allow us to examine them in the same dataset. While Blanton et al.'s (1996) original paper—and Blanton and Fargher's (2008) later book on collective action focused on state-level societies—we expect that the impetus of leaders to seek to maintain control and power is fairly universal, regardless of size of polity (Russell 2004) and regardless of whether there is a food-destroying disaster or not. Leaders in state-level societies and

TABLE 1. Selected characteristics of the study sample plus study-variable values. Complexity is defined as highest level of leadership of a polity: 1 = no community leaders, 2 = community leaders, 3 = 1 level above community, 4 = 2 levels about community, and 5 = 3 levels above community. Levels 4 and 5 are usually considered to be states (Murdock and Provost 1973).

Society	Focal date	SCCS Identifier	Current geopolitical location (nation-state)	Political complexity/integration	Dichotomized disaster exposure	Overall governance strategy
Abkhaz	1880	55	Georgia	3	High	Mixed
Aleut	1778	123	Alaska	3	Low	Mixed
Amhara	1953	37	Ethiopia	5	Low	Corporate
Aranda	1896	91	Australia	2	Low	Corporate
Balinese	1958	84	Indonesia	4	Low	Corporate
Bambara	1902	22	Mali	3	High	Corporate
Basseri	1958	58	Iran	4	High	Exclusionary
Rwala Bedouin	1986	46	Egypt	3	High	Exclusionary
Cuna (Tule)	1927	158	Panama	3	Low	Corporate
Ganda	1875	12	Uganda	5	High	Exclusionary
Iban	1950	85	Malaysia	2	Low	Corporate
Ifugao	1910	112	Philippines	1	High	Exclusionary
Island Caribs	1932	161	Dominican Republic	2	High	Exclusionary
Kung	1950	2	Namibia	3	High	Corporate
Kurd	1951	57	Iraq	4	Low	Exclusionary
Goajiro	1930	159	Colombia	3	High	Exclusionary
Lapps	1950	52	Norway	2	Low	Corporate
Lepcha	1937	68	India	3	Low	Corporate
Manus	1929	96	Australia	2	Low	Exclusionary
Mbuti	1950	13	Congo	1	Low	Corporate
Nyakyusa	1934	8	Tanzania	4	Low	Corporate
Pawnee	1867	142	United States	3	High	Corporate
Santal	1940	62	India	4	Low	Corporate
Trobrianders	1914	98	Papua New Guinea	3	High	Exclusionary
Turks	1950	47	Turkey	5	High	Mixed
Yapese	1910	110	Micronesia	3	High	Mixed

even chiefdoms have more tools at their disposal than do leaders in politically less complex societies—as well as face different constraints (complexity is addressed in the next subsection on measures). Nonetheless, leaders in these various settings share broad similarities in seeking coherence or a type of predictability in their leadership behaviors even when the specific tools available to them differ. [Peregrine and Ember \(2016\)](#) used a sample ($n = 11$) that included ethnographically described societies of different political levels from the past two centuries when they found that exclusionary strategies were more common when societies had experienced higher levels of disasters. We tested for differences between complex and less complex societies and present the results. [Table 2](#) presents the distribution of the societies by political economy strategy, level of disaster exposure, and levels of political complexity; the various levels of political complexity in [Table 2](#) are well distributed geographically.

c. Measures

Cross-cultural research with secondary data typically involves selecting a sample of societies and then looking for relevant entries within books, articles, travel reports, or other ethnographic material that can be coded as proxies for independent and dependent variables ([Ember and Ember 2009](#)). In this study, coders were tasked with reading excerpts, identifying relevant excerpts, and then coding the behaviors or

attributes of leaders in this study. They typically read accompanying pages in the monographs to understand context. Students in a seminar learning to code cross-cultural data selected the societies they were interested in coding. Their codes were not typically based on sufficient paragraphs or qualitative data, so the authors searched for further relevant material on most of the sample societies.

1) DISASTERS

Our independent variable was food-destroying disasters, and our dependent variable was the general political economic strategy of leaders. We coded our dependent variable but relied on previously published codes for the independent variable of disasters. Our disaster code was based on the published disaster codes of [Ember and Ember \(1992b\)](#). In general, these disaster codes concerned presence/absence of disaster(s) or societal members' response to food-destroying disasters. [Ember and Ember \(1992b\)](#) reported on coded ethnographic reports for the presence or threat of “severe natural disrupters of food supply” as experienced by a society across a 25-yr time span. These food-destroying disasters may be caused by flood, drought, or occasional pest invasion. A score of 1 was where there is nearly no report of food-destroying disasters; a score of 2 was where there is no report of disasters but the sense of a threat of such a disaster; a score of 3 was where there is one such disaster happening in



FIG. 1. World map showing the location of the 26 societies used in the analysis, with their latitudes and longitudes as based on the location of the ethnographies reviewed for the focal periods. This figure was created by the authors using Google Maps.

the 25 focal years. A score of 4 was where more than one food-destroying disaster has taken place during those 25 years.

We dichotomized the codes of [Ember and Ember \(1992b\)](#) into high and low levels of food-destroying disaster. Why dichotomize? We were interested in contrasting places that had been affected by disasters versus societies that have not been affected by disasters for the focal period. Our hypothesis

about leaders using relatively corporate versus relatively exclusionary leadership strategies is general enough that we would not expect detailed gradation in exposure to disasters (one vs two disasters in the case of Ember and Ember) to provide us with greater insights regarding governance challenges in this relatively new domain of inquiry. Additionally, to support this proposition, [Table 5](#), described in more detail

TABLE 2. Ethnographic cases examined for political economic strategies of leaders, by disaster exposure (the level of political complexity is in parentheses, as per [Table 1](#)).

	High disaster exposure	Low disaster exposure
Corporate political economic strategy	Bambara (3) Kung (2) Pawnee (3) — — — — — — —	Amhara (5) Aranda (2) Balinese (4) Cuna (3) Iban (2) Lapps (2) Lepcha (3) Mbuti (1) Nyakusa (4) Santal (4)
Mixed political economic strategy	Abkhaz (3) Turks (5) Yapese (3)	Aleuts (3)
Exclusionary political economic strategy	Basseri (4) Rwala Bedouin (3) Ganda (5) Ifugao (1) Island Caribs (2) Goajiro (3) Trobrianders (4)	Kurds (4) Manus (2)

TABLE 3. Number of societies in sample by level of political hierarchy/complexity/integration.

Strategy	No political structure	Autonomous community	1 level above community	2 levels above community	3 levels above community
Exclusionary	1	2	3	2	1
Mixed	0	0	3	1	1
Corporate	1	4	4	3	1
Percent of sample at this level	6%	23%	39%	19%	12%
Percent of SCCS at this level	7%	38%	25%	15%	16%

in the results section, shows the Kruskal–Wallis rank values for the four disaster levels from the prior paragraph in terms of the various forms of political economy.

2) POLITICAL ORGANIZATION

Table 3 provides the distribution of the sample societies by levels of political organization (Murdock and Provost 1973), also known as levels of political complexity, levels of political integration, or levels of political hierarchy. We characterize this factor in Tables 1 and 3, plus we explore in the results section the potential impact of the level of political organization on the relationship between disaster frequency and leadership strategy. The sample has a normal distribution across the levels of political hierarchy. This means that state-level societies (i.e., the top two levels, or 4 and 5) are statistically somewhat underrepresented for comparing with nonstate societies, but the distribution in Table 3 is indeed representative of the ethnographic record as can be seen in the comparison of percentages from our sample versus percentages that exist in the representative SCCS. To control for level of political hierarchy, our analysis also involved Fisher's exact tests for complex societies versus tests for societies with only leaders at the community level or below (e.g., family band).

3) POLITICAL ECONOMIC STRATEGIES OF LEADERS

The three authors each separately coded political economic strategies of the leaders during the focal dates of the ethnographies of the 26 sample societies. We coded at the political level most relevant to the control of or influence over resources pertaining to food production and distribution. In many cases this was the village—even in a state society—and in other cases this was the chief who oversaw the villages, and in other cases the state level was most relevant for control of resources around food production and distribution. Coding proceeded without the coder knowing each society's disaster code. Cross-cultural data coding typically relies on one or two coders, but all three of us coded each society due to the relatively small sample size in order to achieve robust codes. We coded leaders' strategies as corporate or exclusionary when ethnographies of a society showed that the leader(s) exhibited a preponderance of corporate versus exclusionary leadership behaviors. When characteristics from both ends of the political economic continuum were clearly present and strong, we labeled a society's leader(s) as having a mixed leadership strategy. We suppose that all societies could be considered mixed, but we coded as one type or the other if most of the data appeared to

belong to a coherent set of activities that could be characterized as exclusionary or corporate. For any given society, one of the authors typically took 1–5 h to find between 5 and 20 paragraphs selected from the ethnographies available for a society's focal time period and geographic area [see also Jones (2010) for the coding method]. The coder that selected paragraphs then shared the paragraphs with the other two coders, and it took up to an hour per society for each other coder to review the various paragraphs and then arrive at their own code of corporate, exclusionary, or mixed.

Not all ethnographic cases presented information on all of the political, economic, and ideological leadership behaviors. We started out with around 40 societies but ended up with 26 cases because of a lack of relevant material to code or lack of agreement. The three authors met an average of biweekly for about 6 months to discuss every society and its code (i.e., corporate, exclusionary, or mixed). We agreed on a code for a leader's political economic strategy, or we decided to exclude the society when agreement could not be reached.

To control for quality of the coded data, each coder gave a reliability rating for paragraphs/pages consulted, as follows: 1 = ethnographer provided direct comment on political economy, 2 = high-quality example of any of the political economic behaviors, 3 = multiple partial examples of political economic behaviors within and between ethnographies, and 4 = interpretation based on sparse evidence. We analyzed only cases with political economy codes with quality measures 1–3, thus resulting in a sample of 26 societies. We also checked the concurrence or similarity of the geographical region of Justinger's (1978) and Ember and Ember's (1992b) societies with the geography of the cultural groups we coded to make sure the sources covered the same place for the same time frame (from 15 years prior to the focal date up to 10 years after the focal date). Analyses were conducted using IBM Statistical Product and Service Solutions (SPSS) Statistics 26, and appropriate tests used are reported in section 3.

3. Results

Our goal was to examine whether exclusionary governance strategies were more likely to occur in societies more frequently faced by food-destroying disasters, and thus corporate strategies by leaders would be more likely in societies that saw no disasters or threat of disasters during the focal period. Table 4 presents the level of disaster exposure by general political economic strategy. Most societies tend to fit the

TABLE 4. Level of disaster exposure by political economic strategies during focal time period.

	High disaster exposure cases (expected value in parentheses)	Low disaster exposure cases (expected value in parentheses)
All polities ordinal ($n = 26$; Fisher's exact 2-sided = 0.024)		
Corporate	3 (6.5)	10 (6.5)
Mixed	3 (2)	1 (2)
Exclusionary	7 (4.5)	2 (4.5)
All polities dichotomized, mixed as exclusionary ($n = 26$; Fisher's exact 2-sided = 0.017)		
Corporate	3 (6.5)	10 (6.5)
Exclusionary	10 (6.5)	3 (6.5)
Community-level polities, mixed as exclusionary ($n = 8$; Fisher's exact 2-sided = 0.464)		
Corporate	1 (1.9)	4 (3.1)
Exclusionary	2 (1.1)	1 (1.9)
Supracommunity-level polities, mixed as exclusionary ($n = 18$; Fisher's exact 2-sided = 0.054)		
Corporate	2 (4.4)	6 (3.6)
Exclusionary	8 (5.6)	2 (4.4)

predicted pattern—a positive association exists between a broad governance strategy (from less exclusionary to more exclusionary) and level of disaster exposure. These data suggest that corporate leadership strategies develop primarily in low disaster settings, and that exclusionary leadership strategies typically exist where the level of disasters (or threat of disasters) is high. Exceptions to the proposed thesis indeed exist; there were two societies with exclusionary leadership strategies and low disaster exposure, along with three societies with corporate leadership strategies and high disaster exposure. Despite some differences in variable definitions used to characterize exclusionary and corporate societies, our analysis generally concurs with [Peregrine and Ember's \(2016\)](#) finding about leaders' *political behaviors*—that use of the exclusionary political strategy in a society tends to be associated with greater experience with food-destroying disasters.

Since our objective was to broadly compare exclusionary and corporate governance strategies, the Fisher's exact result in [Table 4](#) ($p = 0.027$, 2-tailed, with $n = 22$) excluded the four societies with mixed strategies, that is, societies that have multiple clear strong elements of both corporate and exclusionary practices by the leader(s). We also ran Fisher's exact test on the full 3×2 matrix in [Table 4](#) that includes mixed societies as a half-way point between corporate and exclusionary strategies, which produced similar results ($p = 0.024$, 2-tailed, with $n = 26$).

We recognize that mixed societies need not necessarily be treated as halfway between the other two. Indeed, we find it reasonable to think of leaders that have mixed strategies are more akin to leaders with exclusionary strategies because of the lack of a unifying cosmology plus a greater reliance on authoritarian power for both mixed and exclusionary strategies. A Kruskal–Wallis test of high versus low levels of disaster produced mean rank of 17.1 for exclusionary, 16.8 for mixed, and 10.0 for corporate, lending further credence to our

idea that mixed governance strategies may be more akin to exclusionary strategies. Thus, we analyzed a 2×2 matrix of corporate versus mixed/exclusionary—resulting in another significant result (Fisher's 2-sided = 0.017, with $n = 26$), which also suggests that mixed strategies might be considered more like exclusionary strategies.

Since political complexity can generate different dynamics of leadership in comparison with contexts with lower levels of political integration, we conducted an examination of small-scale societies (i.e., those having leaders only at the community level or no formal leaders) versus complex societies (i.e., those having leaders of multiple communities or higher levels of political integration). We note that, despite a marginally significant result, some of the results might be more pertinent in complex societies ($p = 0.054$, 2-tailed, with $n = 18$) than in small-scale societies (Fisher's 2-sided = 0.464, with $n = 8$)—although the dichotomized sample with all cases had a result above with more robust significance, and we recognize that the small-scale society sample is very small. Remember, that test is not a comparison of state and nonstate societies, it is a comparison of community-level polities and polities with supracommunity political organization. In [Table 5](#), we show Kruskal–Wallis mean ranks to justify our dichotomization of the disaster variable from the original four-item ordinal measure. The no disaster and threat of disaster values were similar in terms of the corporate/exclusionary mean rank for the 25-yr focal periods examined for each society, while values of one and more than one disasters were similar to one another. Next, we consider how some of the leader behaviors look in everyday life, and what the overall strategies might appear on the ground.

a. *Ethnographic examples*

A complementary approach to the statistical examination of disaster governance is to explore more in depth the ethnographic

TABLE 5. Kruskal–Wallis mean rank of political economy for each of the four original [Ember and Ember \(1992b\)](#) disaster frequency levels (higher values are more corporate leadership strategies).

Political economy	Disaster frequency	N	Kruskal–Wallis mean rank of political economy
Political economy, ordinal, with mixed societies (2) between exclusionary (1) and corporate (3)	1	8	15.19
	2	7	15.71
	3	4	10.38
	4	7	11.14
	Total	26	
Political economy with mixed as exclusionary	1	8	15.13
	2	7	16.29
	3	4	10.25
	4	7	10.71
	Total	26	
Political economy without mixed societies included	1	7	14.25
	2	7	14.25
	3	3	8.67
	4	5	11.83
	Total	22	

cases of how leaders in specific societies with different disaster frequency tend to behave. We also wanted to examine exceptions to our expectations. In more detail, ethnographically, how do we understand when an exclusionary strategy occurs despite leaders facing no food-destroying disasters (rather than one or more), and why does a corporate strategy occur when leaders do face disasters? The descriptive case approach we present next is not a test of the research question but does give a clearer idea of how leaders behave in these disaster-influenced contexts. To illustrate the predominant pattern of exclusionary strategies occurring in high disaster contexts and corporate strategies occurring in low disaster contexts, as well as to understand the exceptions to these governance strategies in the face of different levels of food-destroying disasters, we highlight four societies at specific points in time ([Table 6](#)).

Two of the examples we chose fit the predicted pattern of exclusionary strategies in high disaster contexts (Trobrianders) and corporate strategies in low disaster contexts (Nyakyusa). As exceptions to the proposed relationship between disasters and political economic strategies, we discuss the Manus (exclusionary with low disaster) and the Santal (corporate with high disaster) societies. These exceptions exhibit some of the complexities involved in trying to classify governance strategies in disaster settings, and they also indicate possible workarounds that leaders find in order to stay in power when faced with disasters. To stay focused on the topic of food destruction, we highlight the foodways of each society in conjunction with governance, and we also consider colonial contexts that vary in their impact on food security governance strategies of local or supralocal leaders.

b. Exclusionary strategy examples

If most of the societies led by exclusionary governance strategies in our sample also had experienced food-destroying disasters for the focal period, how do we generally characterize the ways that exclusionary strategies structure mitigation and recovery for food-destroying disasters? Exclusionary efforts most

generally involve the following: 1) economically—symbolizing power through externally acquired prestige goods; 2) ideologically—emphasizing commitment to people in one’s family/clan/lineage; and 3) politically—nurturing connections to people with resources and power—particularly externally using both diplomacy and conflict. This approach would address disaster mitigation and recovery through exclusionary access to resources, where family/clan ties and ties to external entities can help in mitigation/recovery. These exclusionary behaviors are not just used in time of disaster. We examine both disaster and nondisaster exclusionary behaviors in our case studies of Trobrianders and Manus leaders.

1) EXCLUSIONARY GOVERNANCE WITH HIGHER LEVELS OF FOOD-DESTROYING DISASTERS

The Trobrianders fit the expected pattern of high disaster and exclusionary leadership strategy for the focal time period 1904–29. This period began with transfer of colonial control from Germany to Australia ([Weiner 1933](#)). The Trobrianders leaders’ exclusionary ways of dealing with disaster and insecurity included indebting their neighbors to them through gifting, as well as through ritually trading preciosities along with the trade of food to maintain external access to resources and legitimacy. At least since [Malinowski \(1935, p.160\)](#), ethnographers among the Trobrianders have mentioned the adaptive usefulness of such exclusionary strategies in times of famine or drought (see also [Powell 1960, p. 119](#)). Powell specifically noted:

Island-wide famine meant the complete disruption of normal social organisation, during which urigubu arrangements broke down, while only links between relatively distant villages might result in any real alleviation of regional shortages. In terms of Leach’s analysis, urigubu prestations would link subclan hamlets and the high frequency of intra-village prestations is in a way in accordance with this conception; but local shortages tend to affect all the gardens of a village [. . .] or village cluster [. . .]. Inter-village prestations within the cluster may help to ensure an

TABLE 6. Typical ethnographic cases exhibiting variation in governance and disaster frequency.

Society	Time period	General governance	Disaster frequency
Manus (Papua New Guinea)	1919–44	Exclusionary	Low
Trobrianders (western Melanesia)	1904–29	Exclusionary	High
Nyakyusa (Tanzania)	1924–49	Corporate	Low
Santal (Bangladesh)	1971–96	Corporate	High

even distribution of the garden produce available, but are not likely to increase the supply in any one village significantly if there is a local shortage (Powell 1969, p. 588).

Yam and other roots were grown in gardens as the mainstay of food production (Austen 1939). However, as noted in the quote above, it was common for root production to be variable from year to year. Since leaders did not oversee the organization of food production, we see the maintenance of ties with other polities not just as a way to mitigate food-destroying disasters, but also as an integral part of the leader's exclusionary governance strategies to maintain their prestige and power—including through frequent warfare and competition between villages or sets of villages, as noted by Powell (1960).

2) EXCLUSIONARY GOVERNANCE WITH LOWER LEVELS OF FOOD-DESTROYING DISASTERS

As an exception to the thesis that exclusionary strategies are typical when experiencing food-destroying disasters, the exclusionary leaders of the Manus of New Guinea enjoyed a low frequency or threat of disaster for the focal time period of 1919–44. Manus' rulers, despite not encountering disasters, used an exclusionary strategy through trade with distant groups—leaders received valuables such as dogs' teeth, shell discs, and sometimes pigs. These valuables were exchanged with affinal kin—in the end, such trade was important for a leader's position in his own village (Gustafsson 1992). Swidden agriculture focused on trees and root crops—along with coconut collection and/or fishing for coastal or island dwellers. Coordination of food production did not come under the power of leaders, generally, while there was a system of external relations of exchange of fish from islands for starch from mainland (Carrier 1991).

In the following passage, we see how leadership involved a mixture of kin-based exclusion and political centralization, plus charismatic appeal—as opposed to moral or bureaucratic corporate appeals. Some moral control is exerted through ancestor worship but, again, that is a kin-based ideology:

That is, a leader possessing great authority might succeed in making the villagers take part in community work, while a weaker leader might fail completely. A leader, even if he is elected, therefore, still has to prove himself much in the same way as did a traditional leader. When we were discussing the development of the Movement, we said that the most successful leaders were those who were of lapan rank. This situation does not seem to have changed, since the lapans are still considered to be best suited, through their affinity with the ancestors, to organize the activities of the village. The lapans, therefore, have succeeded, not only as lawyers, but also as elected komitis, in

extending their field of influence in the new political organization, especially since they are still also leaders of their own house communities (Gustafsson 1992, p. 199).

If, in settings not experiencing food-related disasters, we expect to see primarily corporate governance techniques chosen, why would the leaders of the Manus continue to choose primarily exclusionary approaches? In other words, why did they not construct elaborate infrastructure and social statuses and cosmologies if their society was free of destabilizing food-destroying disasters for decades? We assume that despite the costliness of public goods and thus the difficulty of maintaining corporate strategies sometimes, it is ultimately easier for leaders to appeal to and appease the populace and stay in power through moral and cosmological appeals than it is to exclude them and ignore them. Besides the truism that humans are capable of most anything, one possible explanation for exclusionary strategies by Manus leaders is that the Manus live on an island. In our review of the ethnographies and others not included in this sample due to lack of disaster data, we found that very few corporate strategies develop or persist on small islands. This lack of insular corporate strategies on islands is possibly due to the obvious geographic circumstance of needing to trade with and access resources from other populations—as was the case for the Trobrianders. Another possibility for the Manus leaders maintaining an exclusionary strategy during the focal period is that occupation by Australian forces in the mold of the previous German colonial powers right before the study time period destabilized the precolonial collectivistic or corporate governance approaches of Manus leaders (see Carrier and Carrier 1989), thus leaving a greater opening for what we could call a more exclusionary governance strategy.

c. Corporate strategy examples

1) CORPORATE GOVERNANCE WITH LOWER LEVELS OF FOOD-DESTROYING DISASTERS

The Nyakyusa fit the proposed pattern shown in Table 4—their leaders employed mainly corporate activities and faced no disasters in the focal time period and place covered (1924–49). The ethnographies consulted about the Nyakyusa provided clear evidence of moral appeal, mutual obligation, and ritual—including food production—as integral to the governance strategies leaders chose in this society for the focal time period. *Kyungu* is the term used for divine king:

The people of Ngonde hoed large fields as tribute to the *Kyungu* and if they failed to do so 'he grew angry and poured all the water out of the pot in which he kept his rain stones' (vide infra, p. 114) and 'the sky dried up'. Then the chiefs called their men to

hoe . . . ‘They hoed and hoed and hoed and their wives planted, then the rain came in a torrent . . . Kyungu created much rain.’ (Wilson 1959, p. 43).

Nyakyusa food production of the focal time period revolved largely around plantain, banana, and grain cultivation, along with cattle herding. The quotation above shows how leaders were involved in the organization of food production. Otherwise, land was distributed through the age villages until later in the focal period when the nuclear family became more dominant for managing land (Kenny 1995).

British indirect rule for four decades after World War 1 meant hierarchical political structures gradually supplanted more centralized political structures (Ndembiwe 2006). This means that direct reporting to the center from communities was replaced by midlevel rulers—bureaucrats, even—who took responsibility for law/accountability, finance, and moral leadership. This replacement of centralization—where the chief or king could hear the claims of anyone—with hierarchy characterized by rule-abiding bureaucracies may not have changed the broad political economy much. Although such hierarchical bureaucratic organization was resisted by tribal chiefs, bureaucratization typically is in line with corporate ruling tactics.

2) CORPORATE GOVERNANCE WITH HIGHER LEVELS OF FOOD-DESTROYING DISASTERS

Since not all societies governed via corporate strategies are disaster-free, we want to know how leaders can maintain corporate approaches when there are food-destroying disasters. Corporate strategies structure vulnerability and response through 1) politically focusing inward and emphasizing bureaucracy and a fixed hierarchy, 2) ideologically maintaining the imperative that everyone strive to keep the cosmos in order, and 3) economically using public goods (and thus sometimes food production and distribution) to maintain that political hierarchy and ideological commitment to the whole, as exhibited by the Santal.

The other society with corporate governance we chose as an example were the Santal (1971–96), who during the focal period maintained a rigid and complex social system despite being faced by food-destroying disasters. What allowed a corporate political-economic orientation to survive frequent disasters? More specifically, how could leaders stay in power while maintaining a rigid cosmology, involvement in staple goods production (which would be subject to destruction by disaster), and generally ignoring international or culturally external resources—when frequently bombarded by extreme events?

This disaster governance framework generally holds that corporate strategies are typically less flexible for leaders to maintain power in the face of extreme events (see also Blanton 2010). However, perhaps there are constellations of corporate strategies that are either flexible enough or resistant enough to avoid major political reorientation in the face of food-destroying disasters. The ethnographies on the Santal for the period 1971–96 indicated the importance of the strength of ideology, religion,

and interdependence—and the role of the leader in supporting such corporate orientations—especially for resisting or absorbing food-destroying disasters (Mukherjea 1962):

To go into details, the Headman with his assembly will raise subscriptions for the public festivals like the December Harvest-Home, for religious feasts, and for offering libations to the deities of serious epidemics affecting the tribe. In all cases of marriage and funerals, the Headman and his advisory body must attend. Such ceremonies without them are unthinkable to the Santal (Mukherjea 1962, p. 155).

British colonialism over the two prior centuries may have built upon prior Santal political economic governance. Harris (1989) noted that British colonial rule perpetuated and reinforced the disadvantage experienced by local peasants with regard to their landlords and land rights, despite a lack of a caste system among the Santal. But at the same time, a centralized polity accompanied by high levels of collectivism promoted by leaders may well have assisted the Santal to cope with the tragedies from natural disasters—particularly since the floods the Santal experience are relatively predictable. We expect this is because the political, economic, and ideological facets of a corporate society could be easier to sustain not only under stable circumstances, but perhaps also under predictable circumstances—even if less stable.

4. Discussion

Food-destroying disasters appear to be associated with leaders’ deployment of exclusionary governance strategies. Our findings point in favor of the general hypotheses that 1) corporate strategies are free to, and tend to, develop in low disaster settings, whereas 2) exclusionary strategies may be more common in high disaster settings, despite workarounds that leaders with generally corporate strategies can achieve. While leaders using exclusionary strategies might be threatened with decreases in power over certain sectors due to food-destroying disasters, as our results suggest, governance via corporate political-economic strategies might be more threatened by a wholesale loss of power when faced with destabilizing disasters.

Addressing collapse, but not disasters, Blanton (2010) found that collective states tend to last longer or experience a more sustained conservation stage of development, but he hypothesized that they nonetheless collapse when there is corruption, bureaucratic irregularities, and overtaxation. To us, this sounds like tendencies toward transformation into exclusionary leadership strategies: corruption emphasizes family and friend as do bureaucratic irregularities, and overtaxation is not an absolute measure but a relative one—leaders tax to benefit themselves but do not redistribute the wealth. The loss of trust in government by the people, according to Blanton, brings about collapse. We would agree, but disasters seem to have a good chance of creating incoherence in the cosmological and bureaucratic focuses of the corporate governance strategy. Exclusionary leadership may allow more flexibility structurally economically for maintaining political and ideological coherency and thus for

staying in power when dealing with disaster-related food insecurity. Also, even the toppling of an exclusionary leader in challenging times often puts the blame on the leader for not meeting people's needs rather than blaming the exclusionary strategy itself.

Where food-destroying disasters were actually accompanied by a corporate governance strategy, it appears that leaders were able to forge mechanisms to maintain control of staple good production or distribution, alter the existing belief system to support a new (or existing) cosmological order, and perhaps morally justify that some people at the bottom of the social hierarchy would bear the brunt of the disaster.

Returning to the three broad facets of the domains of specific governance activities—with economic, ideological, and political focuses—we take another look at the economic, political, and ideological propositions underpinning the question of whether disasters are accompanied by relatively exclusionary behaviors by leaders. 1) *Food-destroying disasters challenge leaders' abilities to support public economic infrastructure.* The ethnographic descriptions of the many societies suggest that this is typically so—there were fewer examples of leaders getting people to work together to build things or maintain public works in societies with food-destroying disasters. 2) *Food-destroying disasters are typically accompanied by leaders advocating kin-focused ideology rather than advocating beliefs that seek to maintain cosmological order.* We found this generally to be the case. Exceptions include some cases where leaders were authoritarian and thus assumed roles in rituals but without allowing internal participation in politics and without providing much in the way of public goods. 3) *Externally focused strategies will be more common in societies experiencing food-destroying disasters.* Mainly, leaders in many cases appeared to have connections to other societies (including through warfare or conflict and not just trade or assistance) when their experience with food-destroying disasters was higher.

Some studies on the issue of governance strategies have focused on how leaders specifically acquire revenues used to pay for public goods on how the ruled are able to restrict the power of leaders through bureaucratic controls and through a tacit acceptance of legitimacy in exchange for public goods (Blanton and Fargher 2008, 2009). As such, those studies address only some conceptual pieces of our study. For example, while revenue acquisition may seem similar to the economic focus of leaders' control, there is an important theoretical distinction. Blanton and Fargher's research has focused on two main aspects of economic activity: revenue acquisition and the provisioning of public goods. There are other aspects of the economy that play into governance of the economy that we examined, such as labor control, land tenure, specialty versus staple crops, markets, and ideologies concerning rights over certain resources. And, despite the regulation and taxation of markets by leaders in most state-level societies regardless of broad corporate or exclusionary orientation, direct total control of all markets has rarely been the focus of leaders of societies of any scale. More common is leader control in a market over a few key staple goods—typically for food (often part of a corporate strategy) or over some specific preciosities or elite goods (usually part of

an exclusionary strategy) that, at the same time, enjoys some ideological justification and/or political basis.

We also recognize the argument that the degree to which collective action is effectuated in a society can be one of many factors influencing leaders to modify or adjust their strategies. The more effective that collective mobilization is in any society (as indicated by factors such as the quality of public goods distribution, revenue dependence on the labor of those ruled, the efficacy of public administration, and the presence of regulations over rulers' behaviors), the more likely it is that leaders' strategies for governance and legitimacy are subject to regulation (Blanton and Fargher 2009). While such research is focused on the state, our study differentiated between community-level governance and supracommunity governance. In chiefdoms and small kingdoms that are not states—which constitute a large portion of the ethnographic record, direct control over the economy and resource acquisition is much less than in the case of the state—and so leaders rely heavily on the ideological and political/legal realms to seek to maintain their power.

The section with the four qualitative cases has highlighted both kinds of leadership situations: 1) where governance strategies appear similar (e.g., exclusionary) despite different levels of food-destroying disasters, and 2) where governance strategies appear different despite similar levels of food-destroying disasters. Leaders are not environmentally bound to follow a given strategy—they face myriad strong pressures and seek to find a way to stay in power along with any other competing motivations they might have, such as long-term adaptive capacity or participation of the public in decision making or saving the most lives, not all of which always can be made with a single decision or a single governance tactic.

Staying in power indeed sometimes depends on how useful a governance strategy is for solving the problems faced by people. Many scholars have criticized one-size-fits-all approaches, all-hazards approaches, and top-down responses by governments (e.g., Barber 2015). We see that the situation or context in which the leaders find themselves indeed does matter: What kinds of pressures affront a leader's future prospects for ruling? How long must the leader sustain help to the community? And, now thinking about the ruled, how close does the leader's strategy fit their expectations, and how much are the people contributing to community/societal recovery? The nature of a centralized response—which can be either exclusionary or corporate—depends on the postdisaster stage (e.g., event, response, recovery) in which governmental effort is deployed (Casagrande et al. 2017; Hoffman 1999), perhaps regardless of whether one would see the actual effect of the response as positive or negative.

Now we need to address another set of exceptions to our thesis—what are we to make of clearly mixed strategies (i.e., those bearing characteristics of both exclusionary and corporate strategies)? We found that clearly and overwhelmingly mixed strategies were relatively uncommon in our sample, although all leaders make use of many kinds of exclusionary and corporate tactics at any one time. Mixed strategies are potentially less coherent than are exclusionary or corporate societies and thus might be more transitory. Leaders with mixed governance strategies in this sample generally experienced strong external

pressures like colonialism or modernization *during* the focal time periods. These societies might have been experiencing relatively greater transition than at other times, and their leaders might have been resorting to a variety of governance strategies in order to maintain legitimacy and power during these transitions. Otherwise, we imagine leaders might use a mixed strategy because they govern island societies that are often necessarily engaged in trade or because a major event (e.g., war, political threat, disaster) has provoked a need for leaders to cobble together a variety of activities and strategies. We recognize that leaders may switch to a different political economic strategy as motivated by factors such as being overthrown by an external enemy, colonization, modernization, religious conversion, and/or political revolution. Nonetheless, this study is primarily interested in how and whether leaders facing, and having to respond to, food-destroying disasters tend to employ coherent political economic strategies—regardless of the existence of a variety of other motivations or forces.

To extend the relevance of this framework to contemporary settings and not just keep it focused on the past, we would expect mixed governance strategies to become more common in current times due to 1) the various new governance tools available to (and constraints found by) nation-states in a world system of states and recognized stateless actors and 2) the need of many leaders to respond to social movements and collective action in contemporary politics characterized by the relatively democratizing forces of elections/voting and world treaties (e.g., United Nations). It is also possible that all three coders sought extra hard concurrently to code any given society's leader(s) as having leadership strategies closer to one of the poles rather than allowing a society to be coded as a mixed strategy.

5. Conclusions

Food-destroying disasters are intensifying human vulnerability to food insecurity, emerging epidemics, social inequality, displacement, and death not only through destruction of crops or food supplies, by also through their impact on food supply chains, variability in food prices, and conflict (Cutter 2017). The general challenges to elites in most any society are always the same: to attempt to overcome barriers to maintain or accumulate power through the belief system, the economy, and political organization. However, the resolution of these governance challenges is not necessarily the same for every leader or cabal. Corporate and exclusionary strategies each face distinct challenges as a result of the ways they organize production and construe meaning in community life. Many of these challenges may be compounded by the presence and varied intensity of food-destroying disasters experienced by different societies. While we characterized the leaders' strategies, we did not examine the success of adaptation in the short, medium, or long term. Successful adaptation usually requires overcoming the inertia of existing cultural and political economic practices and thus changing one's strategy although leaders often find it difficult or do not wish to challenge the coherence of the strategy that keeps them in power or the coherence of an entrenched strategy (Plein 2019).

This comparative study examined the broad political-economic strategies leaders choose in societies affected by weather hazards that become food-destroying disasters. We categorized leader behaviors in a small sample of societies along a simple continuum of strategies to begin to cross-culturally explore our questions about postdisaster governance. The broad goal of this study was to discern how hazards differentially accompany ways of life across societies—specifically how the governing elites of those societies generate disaster exposure, create vulnerability, and guide recovery. We reiterate that it is important not to hold rigid to these typologies or to corporate/exclusionary versions of political economy but to use cross-cultural analysis to better understand and explain the dynamics of vulnerability, resistance to change by leaders or subjects, and adaptation in the face of hazards over the short and long term [see Torry (1979) for early review of potential mechanisms for cultural responses to hazards and disasters, and Chen et al. (1983) for early interest of social science in climate change].

At this stage of preliminary investigation in this field of inquiry, we believe a smaller exploratory study was warranted to begin building conceptual devices and start to establish a corpus of facts. The results do not apply to all time and space, necessarily, plus we went out of our way to seek and examine exceptions to our initial proposition. Thus, in the ethnographic vignettes, we demonstrated the complexity of actual cases through our selected case analysis of four societies that cover the possible broad typological outcomes: high disaster/exclusionary, high disaster/corporate, low disaster/exclusionary, and low disaster/corporate. While coding for each specific behavior rather than coding for a general strategy would be another approach, such an approach would cost considerably more time and resources for coding and data management. As a limitation, the comparative approach can decontextualize the specific food insecurity and governance challenges and related mechanisms experienced by leaders and their societies. Future research should also examine more mechanistic facets of these questions about disasters and governance, as well as the variation in suites of leadership behaviors that help leaders maintain their power or control when disasters occur.

Geographical context (e.g., distribution of hazard types and food production strategies) could prove to be an interesting source of variation in distribution of governance strategies, although our secondary data did not permit examining whether governance strategies for floods versus droughts versus other hazards or food-destroying disasters might differ. As a first step in the process of evaluating our hypotheses, we find it prudent to start general and later get more specific with a larger sample that would allow us to evaluate the tens of variables that constitute the mechanisms and processes for the strategies employed by leaders. It is possible that effective and equitable disaster response by governments or other institutions will be different for different types of societies that vary based on other factors. It is possible that the corporate/exclusionary continuum as a conceptual device is found in the future of relatively lower import than are other components of a framework covering governance and disasters. For example, centralization versus decentralization of power and authoritarianism versus democratization are related considerations that cut across the corporate/exclusionary

continuum and are similarly likely to be affected by level of societal organization. We expect future models to be more comprehensive in consideration of relevant factors.

We emphasize again that we are not measuring societal resilience nor successful responses to disasters. We have sought to begin to examine what general strategies are employed by leaders in disaster settings. While we characterized the leaders' strategies, we did not examine the success of adaptation in the short, medium, or long term. Successful adaptive capacity is based on living with change and uncertainty, supporting cultural diversity, employing different kinds of knowledge, and organizing toward sustainability (e.g., [Colombi and Smith 2012](#)). These strategies often contradict the interest of leaders. Successful adaptation usually requires overcoming the inertia of existing cultural and political economic practices and thus changing one's strategy although leaders often find it difficult or do not wish to challenge the coherence of the strategy that keeps them in power or the coherence of an entrenched strategy ([Plein 2019](#)). Political participation—the other side of the governance coin—is potentially promising for helping overcome such inertia. In the service of considering societal implications of the results, we find it ironic that, in the ethnographic record of our sample, disasters more typically are met by governing strategies that are relatively less responsive to helping the public at large and that are not meeting the needs of a public that is in dire straits. It is clear, however, that the arrow could point either direction or both: leaders act exclusionary in response to food-destroying disasters, and/or leaders act exclusionary and that would help turn hazards into food-destroying disasters. For example, [Collins \(2008\)](#) highlights the case where elites' and governing officials' behaviors increased vulnerability to wildfires. Nonetheless, in some cases governments do learn how to provide responses to hazards that reduce future hazards and disastrous effects [e.g., [Smart and Smart \(2009\)](#) on Canada and Hong Kong].

Despite the inherently political nature of deciding what is just and responsive governance, we do wonder: How can governance be fashioned to coherently respond to the needs of commoners or subjects when it is clear that the elites have more of an interest in maintaining their positions and power than in fashioning mitigation and recovery mechanisms that might undermine their own governance strategies? This question might be answered partially by cross-cultural research on social movements and/or collective action (e.g., [Blanton and Fargher 2009](#); [Blanton 2010](#)), where subjects may mobilize against authorities so as to propel the latter to satisfy the masses' needs or demands (for public goods). [Cuny \(1983\)](#) and [Watts \(1983\)](#) early on suggested disasters as a source of opportunity for social change brought about by the public and perhaps by new leadership.

In the end, such an ambitious theoretical approach explores leader behaviors within the goal of predicting societal adaptive capacity in the face of major threats like climate change (e.g., [IPCC 2001](#)), where leader behaviors become one of many predictor variables in a complex model given some particular operationalization of adaptive capacity. For example, exclusionary leadership may be employed to keep a leader in charge, but when does it also align with adaptive capacity? One

definition of resilience has been economic development and human development (instead of, say, human rights or social justice or political participation), and some Africanists have found evidence for effectiveness of an authoritarian developmental state (e.g., [Dejene and Cochrane 2019](#)) and keeping a society from engaging in collective destruction ([de Waal 2012](#)) when facing droughts and internal and external conflict and disease. Such authoritarianism might be classified as exclusionary but is not necessarily so. Sometimes it is challenging to tell the difference between types of authoritarian rule that are more exclusionary versus more corporate. Additionally, the answer about the relation of governance to hazards relies on the fact that adaptive capacity in part depends on the time scale—a short-term adaptation may not be good for long-term adaptation. Such research could require data at broader times scales than we considered here. The archaeological studies we discussed earlier in the paper suggest that, over longer terms, less authoritarian rule with greater collective action might be more sustainable and resilient to myriad pressures despite the corporate strategy's lack of ubiquity in settings with frequent disasters in the generation time scale we considered.

It is worth reminding ourselves that in this research on the political economic strategies of leaders, unexamined is the fact that there is not always homogeneity among those that wield great power within a society. Also unexamined by this particular study is that past and contemporary disaster responses of various time scales also are influenced by more cognitive aspects among the governed: how and what the subjects in a society want, need, demand, and believe before, during, and after disasters. We additionally recognize that expectations and strategies of subjects often prove to be even less homogeneous or predictable than are those of leaders, thus making collective action additionally difficult. In the anthropology of disasters, primary concerns to date have been with the fields of vulnerability or adaptation by subjects but not systematically with the ways that subjects help generate, sustain, or push back against various strategies of governance. This will be a rich area for investigation as populations continue to encounter extreme events and, apparently, the concurrent possibility of leaders trying to maintain power.

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