



RESEARCH BRIEF – MARCH 2013

INSTITUTIONAL CAPACITY FOR NATURAL DISASTERS: METHODOLOGY FOR CASE STUDIES IN AFRICA

EXECUTIVE SUMMARY

The CCAPS program's research on institutional capacity for natural disasters examines the causes of variation in government policies to reduce the risk of, prepare for, and respond to natural disasters. Natural hazards, such as floods, drought, earthquakes, and tropical cyclones, do not necessarily result in disasters, but they present a clear policy challenge for national governments: how does a country prepare for the often unexpected? This brief presents the methodologies used to investigate how governments answer this question. Through a qualitative analysis of ten African country case studies, this study provides a comprehensive evaluation of existing explanations for variation in government efforts to develop disaster management capacities. The research strategy also helps to overcome limitations of previous analyses focused on a small number of cases or inadequate quantitative data, thereby providing new insights into the practice of disaster preparedness.

AUTHORS

Jennifer Bussell is an assistant professor at the LBJ School of Public Affairs at the University of Texas at Austin.

Adam Colligan is a former graduate research assistant at the Robert S. Strauss Center for International Security and Law.

NATURAL DISASTER PREPAREDNESS AND RESPONSE

Natural disasters are a frequent risk around the world, facing developing and developed countries alike. The ability to deal with natural hazards, and the potential disasters associated with them, however, differs dramatically across countries. Within the African continent, where countries such as Mozambique have developed institutional structures to manage disaster preparedness and response, other countries, such as Togo, have done little to respond to increasing risks associated with flooding and droughts in the region.

National governments play a key role in shaping disaster management, and thus affecting the nature of this variation across countries. Yet, analysts have little leverage for understanding why national governments take, or fail to take, a particular stance toward investment in activities that should reduce the overall vulnerability of their countries to natural hazards. This lack of knowledge is not due to a shortage of theories or explanations of why some countries do better at preparing for and preventing disasters. Many possible explanations exist—e.g. differences in economic resources or differing political incentives—but these theories have not been rigorously tested to see which explanation alone or in combination with others does the best job of explaining why there are such differences in countries' responses to disaster risk.

The CCAPS program's research on institutional capacity for natural disasters aims to provide a current assessment of natural disaster management capacities in a set of African states and to offer the first comprehensive empirical test of arguments regarding states' incentives to invest in disaster management activities. Based on an extensive literature review, the research documents the range of explanations posited in social science and policy literature on the

potential factors influencing government policies regarding natural disaster management. This study thus considers potential explanations related to countries' perceived risk of natural hazards, economic strength, electoral incentives and democracy, political development, foreign aid, civil society, and relationships with external actors. These alternative explanations are then tested, using case-based evidence from ten African states.¹

AREAS OF FOCUS

This research approaches the question of natural disaster preparedness and response primarily from the perspective of national governments. It attempts to understand the potential causes of government decisions regarding investment in countries' abilities to reduce the risk of, prepare for, and respond to disasters.² In order to do so, the study attempts to explain variation in national policies, and the implementation of those policies—the primary dependent variables—while setting aside other related topics, including the decision-making of international aid agencies and local non-governmental organizations, as well as the dynamics of post-disaster recovery.

The study pursues some of the most prominent potential explanations of how diverse factors affect a government's political will to invest in disaster preparedness and response.

However, the constraints of a highly complex area of analysis remain. In order to gauge the quality of government capacities to prepare for and respond to natural shocks, it is necessary to have some sense of both the outcomes of natural shocks and potential explanations for what leads to those outcomes. The study also assumes that national policies have some independent effect on the outcomes of natural shocks. This latter assumption is complex and potentially problematic for two main reasons. First, explanatory models of disaster outcomes often rely on a long causal chain involving many factors—such as electoral conflict, population dispersion, and climatic patterns—and are themselves very complex, poorly understood

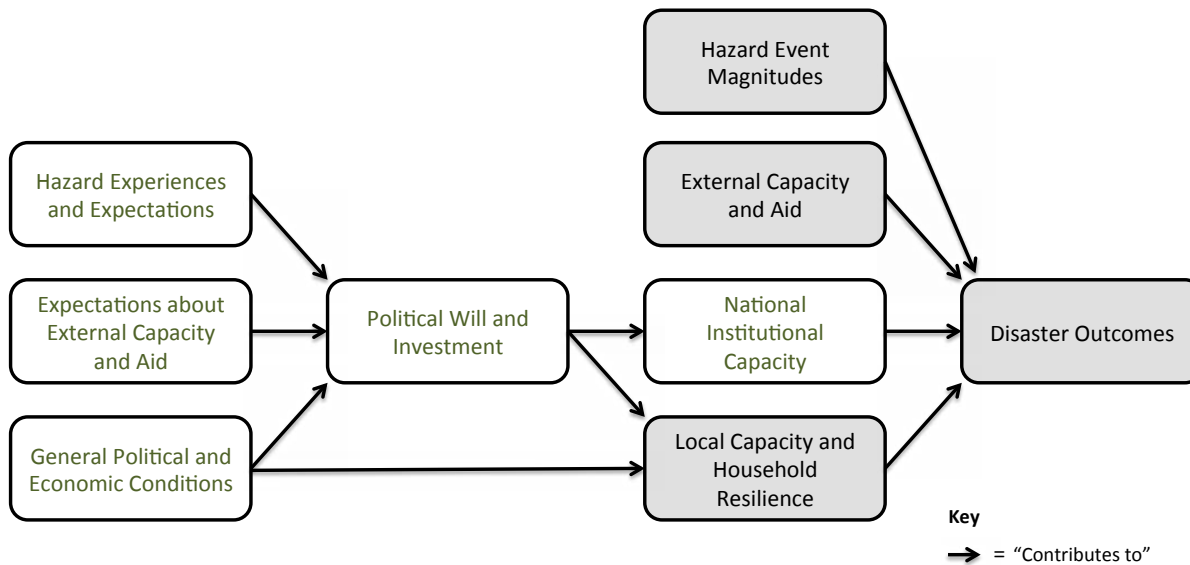
empirically, and often subject to random shocks. Second, researchers can all too easily conflate one concept (such as “outcome” in terms of disaster deaths) with a logically related one (such as “outcome” in terms of how much money was invested in preparedness and response), making comparisons within and across seemingly similar research initiatives quite difficult.

This study has thus sought to test the relationships between potential explanatory factors—the independent variables—in a rigorous manner, with attention to these complexities and the need for caution in comparing a diverse set of natural shocks. This brief outlines the methodology and boundaries of this study, while keeping in mind that the characteristics of countries can have complex relationships that are difficult to parse in any single research initiative.

The research considers a range of issues within a local “neighborhood” of relationships that are relevant to disaster risk. The primary topics of study were hazard experiences and expectations, expectations about external capacity and whether the international community would mobilize aid in the event of a disaster, general political and economic conditions, political will and investment, and national institutional capacity (shown in white boxes in Figure 1). Related issues of hazard magnitude, actual external capacity and aid, local capacity and household resilience, and disaster outcomes are closely related areas outside the focus of this research (shown in gray boxes in Figure 1).

The study reviews and pursues some of the most prominent potential explanations for how diverse factors affect a government's political will to invest in disaster outcome mitigation, as manifest in the commitment of money, skilled personnel, and political capital to address disaster risk. The study also examines how selected bureaucratic and institutional factors mediate between that investment input and the subsequent perceived capacity of national institutions to carry out those functions they are funded to perform. The term “national institutional capacity” is used to encapsulate both the effectiveness of pre-hazard risk reduction programs and post-hazard response and recovery programs.

Figure 1. Research Focus on Factors Influencing Disaster Outcomes



EVALUATING DISASTER INVESTMENT AND CAPACITY

The research design utilized a paired comparison model, in which each country was evaluated in conjunction with one neighboring country. The principal goal was to establish comparisons in which the paired countries face as similar a set of natural hazards as possible, and often the same specific hazard, to facilitate comparison of the responses by national and local governments to similar hazard profiles.

At the same time, countries were selected to incorporate the range of natural hazards typical to the African continent—including drought, floods, and tropical storms or cyclones—and to incorporate countries from across the continent. The resulting country pairs cover all of Africa’s sub-Saharan regions: Senegal and the Gambia, Ghana and Togo, Ethiopia and Kenya, Malawi and Mozambique, and Zambia and Zimbabwe (See Figure 2).

As a starting point for structuring the analysis, this study draws on the Hyogo Framework for Action, established at the World Conference for Disaster Reduction in 2005, which is a United Nations strategy that guides government activities with regard to natural hazards. The framework outlines a set of five overall priorities

for countries to shape policies for disaster risk reduction over the period 2005-15 (see Table 1).

National disaster programs are analyzed in relation to these priorities. Research teams drew on information collected through interviews and secondary materials to evaluate the progress of each country on all aspects of the Hyogo Framework. The material collected was standardized through a single set of interview guides and list of data to be collected. This information was then shared across teams and collaborative discussions were used to compare progress within the set of country cases. The entire research team then scored countries relative to each other on each element of the framework.³ Though this coding strategy does not allow for comparisons to countries outside the study, it provides for within-study analyses of progress to date that can then be used to evaluate the set of alternative explanations.

Even within this structured framework, evaluating investment in disaster policy is a difficult task, as acknowledged by much of the previous literature.⁴ While many countries have established specific departments or ministries to oversee disaster-related activities, funding is often spread across departments and lack of budget transparency in many states is still a hurdle. In addition, dual-use investments such as infrastructure, which have functions during both disaster and non-disaster periods, may not be formally

Figure 2. Ten African Country Case Studies



predicated on disaster risk but nevertheless form the backbone of a country’s ability to cope in the event of a disaster. An understanding of relevant spending in these areas must often be estimated through imprecise information from state and non-state actors involved in disaster-related activities.

To respond to these difficulties, this study focuses on those explicit, dedicated channels of investment whose predominant focus is disaster risk reduction and associated budget items that may contribute to the overall capacity of the state to manage natural hazards. In addition, the research team has sought to leverage an understanding of investment disparities within countries: while the total value of overall investment may be difficult to quantify, interviewees were prompted to discuss the locations and sectors in the country that were the main focus of attention, to gain insight into institutional priorities and motivations.

This research design does not resolve an inherent problem of research based on a small number of cases, which is the presence of many potentially important independent variables and an insufficient number of cases with which to sufficiently test each potential cause of variation. However, it does allow for the collection of expert narrative opinion from national, international, NGO, and “ground-level” stakeholders about the causes of national political commitment,

resource investment, and institutional effectiveness regarding disaster risk reduction.⁵

The qualitative, comparative case design was used in large part due to a number of fundamental limitations in current quantitative modeling related to natural hazards.⁶ First, as international organizations note, “there are no universal standards for archiving environmental parameters for defining hazards and related data. Data exchange, hazard analysis, and hazard mapping thus become difficult,”⁷ not to mention the difficulty of analyzing the factors associated with hazard outcomes.

Second, there are no standardized scales that capture the magnitude of the shocks that are used to measure hazard input. Great strides have been made on standardizing ground-level accelerations during earthquakes,⁸ but this is the exception rather than the rule and is made possible by the unique features of seismic events. Researchers are still far from being able to express a shock in generic units of “potential death” or “potential damage.”

Third, it is difficult to find standardized magnitude data for disaster *outcomes*. Databases on historic disasters differ in their sources and are subject to serious concerns about reporting bias, where countries with less pervasive media coverage, less international attention, or less capable government bodies may tend to show fewer events or a broader spread of estimates of outcomes than they would otherwise. Improvements in reporting coverage over time also make comparisons between outcomes of recent shocks and those of just a few decades ago highly problematic.

Given this range of difficulties with quantitative research on natural hazards and their effects, this study opts instead for the complications of qualitative research. The approach is also one that is appropriate to preliminary empirical research, in that researchers evaluated a wide range of potential explanations, rather than one primary explanation. Because the theoretical literature highlights a large number of potential explanatory variables, discussed below, without providing clear justification for privileging any particular explanation over the others, an inclusive approach was most appropriate for this stage of discovery.

Table 1. Hyogo Framework Priorities for Action

PRIORITY	EXAMPLES OF ACTIVITIES AND PROPOSED OUTCOMES
1. Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation	<ul style="list-style-type: none"> • National institutional mechanisms with designated responsibilities • Inclusion of DRR in development policies and planning • Assessment of human resources and capacities • Political commitment to addressing DRR • Community participation
2. Identify, assess, and monitor risks and enhance early warning	<ul style="list-style-type: none"> • Risk assessments and maps • Indicators on DRR and vulnerability • Early warning mechanisms and people-centered information systems • Scientific and technological development including data sharing, space-based earth observations, climate modeling, and forecasting
3. Use knowledge, innovation, and education to build a culture of safety and resilience at all levels	<ul style="list-style-type: none"> • Information sharing and cooperation • Networks across disciplines and regions • Use of standard terminology • Inclusion of DRR in school curricula • Training on DRR for communities and local authorities • Increased public awareness and use of media for public education
4. Reduce the underlying risk factors	<ul style="list-style-type: none"> • Sustainable ecosystems and environmental management • DRR strategies intergrated with climate change adaptation • Food security for resilience • Protection of critical public facilities • Recovery schemes and social safety nets • Public-private partnerships • Land use planning and building codes • Rural development plans and DRR
5. Strengthen disaster preparedness for effective response at all levels	<ul style="list-style-type: none"> • Increased policy, technical, and institutional disaster management capacities • Dialogue and coordination between disaster managers and development sectors • Regional approaches to disaster response with risk reduction focus • Preparedness and contingency plans • Emergency funds
Source: United Nations International Strategy for Disaster Reduction. <i>Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters</i> . (New York: United Nations, 2005).	

The study conducted field interviews to gather information on specific policies related to disaster preparedness; collected primary government data on disaster spending, natural hazards, and related policies; and collected secondary data from media, NGO, and academic reports.⁹ Researchers combined all of this information to produce comparative studies of disaster policy experiences in each paired case

EXISTING EXPLANATIONS FOR INVESTMENT

A primary goal of this study’s empirical analysis was to collect data to test existing explanations posited in academic and policy literature regarding national investments in disaster management capacity. This

section provides a review of the key arguments proposed to date and tested in this study (see Appendix).¹⁰

The research team considered each of these potential explanations for all of the country cases. In order to do so, the researchers developed questionnaires for field interviews that addressed each alternative explanation, in addition to questions for gathering information related to the Hyogo Framework priorities. Specialized versions of the questionnaire were also developed to draw on the diverse knowledge of different audiences: government officials, representatives of non-governmental organizations, and academics. The team was then able to collect comparative information on the relevance of each explanation across interviewees and countries. The findings from these interviews, as well as analysis of primary government documents and

secondary materials, were subsequently used to score each potential explanation for its relevance in each country.¹¹ The general argument of each explanation is considered here.

Perceived Risk

A key factor for states' disaster policies is likely to be the overall perceived risk of future hazards. In countries hard hit by disasters in the past, analysts link the experience of casualties, infrastructure damage, and economic loss to efforts to reduce the risk of similar losses in the future. In addition, previous experiences interacting with diverse national and international organizations in the disaster response process are hypothesized to increase efforts to develop disaster management capacities.¹² The literature on this topic tends to emphasize the *formalization* of national knowledge about expected future hazards as the key parameter in that knowledge having an impact on investment decisions.

This study thus collects empirical evidence to test the relationship between the perceived risk of a natural hazard and the likelihood that a government will instate policies to prepare for those hazards.

Economic Strength

Economic arguments also predominate in much of the disaster literature, with the typical expectation that wealthier governments will spend more on prevention.¹³ However, authors differ on the underlying logic of how economic factors impact disaster risk reduction (DRR). For example, with regard to earthquakes,¹⁴ Keefer et al. posit that "the opportunity costs of expenditures to limit earthquake mortality are higher in poor countries, so that rich countries should respond more strongly than poor countries to higher earthquake propensity."¹⁵ Other literature instead highlights the potential negative feedback effects from increasingly devastating disasters, which can threaten the productivity of wealthy countries or regions within countries, while also weighing down poor economies and further dampening their ability to invest.¹⁶

This study brings together data on economic resources and market conditions to assess the importance of strong economic conditions for spurring investment in disaster preparedness and response capacity.

Electoral Incentives and Democracy

The nature of a country's political system is also expected to play a role in its investment in disaster preparedness. Analysts have become increasingly aware that disaster policies are directly linked to political incentives, which can differ dramatically across countries.¹⁷ A range of factors, however, can affect the nature of political incentives. While authors such as Kahn posit that democracy, in general, is associated with fewer deaths from natural disasters,¹⁸ Keefer argues that democracy, or electoral competition, alone is insufficient for explaining variation in disaster outcomes.¹⁹

Instead, Keefer, Neumayer, and Plumper suggest that institutionalization of the party system can boost the propensity of governments to prepare for natural shocks, in particular earthquakes, by increasing the demand for public goods provision.²⁰ Specifically, "in countries where citizens or members of the ruling party can more easily sanction leaders for poor performance, leaders should respond more quickly to higher earthquake propensity."²¹ They argue that this characteristic, which can arise in both democratic and nondemocratic regimes, is even more relevant for policy outcomes than electoral competition on its own.

Electoral conditions may also shape the distribution of disaster spending, both in terms of preparedness and response. Cohen and Werker argue that governments may target spending to favor "regions that are politically aligned with the party in power."²² Here, politicians in democratic environments may be more affected by "electoral myopia," in that they invest only in expectation of the next election, rather than for long-term preparedness.²³ Authoritarian regimes may thus be more likely to invest in overall, rather than targeted, preparedness.

The expectation of future natural shocks may also interact with electoral conditions to affect policy. Spending on disaster preparedness is often difficult to translate into electoral benefits. Keefer outlines this argument in noting that, "Building codes, early warning systems, disaster relief planning and floodplain management are all difficult for citizens to observe. Even if individuals can observe them, they cannot easily assess the contribution they make until a disaster occurs."²⁴

As a result, and because it is easier to evaluate the quality of spending on response, multiple authors highlight that voters are more likely to reward response spending than spending on preparedness and mitigation.²⁵ However, as natural shocks become more frequent, citizens may become less likely to punish politicians for the preparedness activities that then reduce the chances of a negative electoral response when a shock does occur.²⁶

To evaluate how these various electoral incentives impact spending on disaster preparedness, mitigation, and response, this study collects empirical data on election histories, electoral results, and other measures of democracy.

Political Development

Another political factor impacting DRR may be the overall character of government institutions. In particular, the degree of development in the bureaucracy and the presence of corruption in government operations may shape the quality of programs put in place to prepare for or mitigate the effects of natural shocks. With regard to corruption, officials' willingness to skim funds from programs intended to support preparedness and response, or to accept bribes from individuals and companies attempting to affect regulations or avoid their enforcement, can limit the quality of policies put into place. In the case of earthquakes, Escaleras et al. argue that such corruption is a key factor in the enforcement, or lack thereof, of building codes.

Political development more generally concerns the degree to which the bureaucracy is meritocratic and insulated from political whims in the implementation of policy. As Evans and Rauch have shown, the extent to which government agencies use meritocratic recruitment and offer predictable career paths can be linked to policy outcomes such as economic growth.²⁸ Bureaucracies with more meritocratic policies may then also be better able to promote other policy outcomes, such as those related to disaster preparedness. Similarly, the degree to which bureaucrats are insulated from political interference may affect their ability to implement new policy initiatives.²⁹

This study analyzes country case evidence, including measures of corruption and evaluations of bureaucratic

politicization, to assess how a country's level of political development impacts its effort and ability to respond to challenges from natural hazards.

Foreign Aid

Another key argument in the literature draws on the idea of moral hazard in foreign aid. As Cohen and Werker argue, "governments underinvest in disaster prevention when they know that they will be bailed out in the event of disaster."³⁰ Keefer outlines a more nuanced impact of aid, arguing that, "Aid has two potential and offsetting effects. One is to loosen budget constraints that prevent countries from investing in ex ante disaster risk reduction.... However, past aid is a signal to countries of the amount of aid that they can receive in the event of a disaster...and countries substitute post-disaster relief for pre-disaster risk reduction."³¹

Raschky and Schwindt provide an empirical test of this hypothesis in the case of earthquakes, storms, and floods. They find evidence to support a predominantly negative effect of aid in the case of storms, but the results are ambiguous for floods and earthquakes.³² These findings suggest both that analysts and practitioners should be cautious in overestimating the negative effects of aid and that there is reason to consider the type of natural shock when evaluating the incentives for investing in preparation and mitigation.

The inverse of this explanation is that countries *not* expecting to receive international support in the event of a disaster will be more likely than others to invest in preparedness. This assertion is in some cases referred to as the "pariah" state explanation.³³

This study gathers evidence on international aid, donor relationships, and domestic spending to assess whether the influence of foreign aid helps explain the behavior of states in disaster preparedness and response activities.

This study gathers evidence on international aid, relationships with international organizations, and domestic spending to assess whether the influence of

foreign aid helps explain the behavior of states with regard to disaster preparedness and response activities.

Civil Society

Civil society organizations often play a part in promoting, and engaging in, disaster preparedness activities. The presence of local non-governmental organizations in a country implies the availability of actors who can directly engage in disaster preparedness and who may have an indirect influence on disaster-related spending through lobbying efforts directed at the national government. In the former case, these organizations may take over responsibilities from the state, either by contract or of their own volition, when state capacity is insufficient. During non-crisis periods, this often takes the form of general services such as education and health,³⁴ but civil society actors also engage in activities specific to disaster risk reduction and preparedness.³⁵

To investigate the relevance of civil society to levels of disaster preparedness, this study gathers evidence on the presence and activities of civil society in general, and disaster-oriented NGOs in particular.

The strength of civil society may also impact disaster preparedness in cases where civil society groups take over responsibilities from the state, either by contract or of their own volition, when state capacity is insufficient.

External Actors

A similar argument can be made for the role of international actors in promoting disaster risk reduction and preparedness. Here, entities such as international aid agencies and international non-governmental organizations may again play both direct and mediated roles in disaster-related activities. Direct actions include implementation of preparedness projects and support for local NGO activities. State actors may then learn from these activities and adopt related state-led programs. External actors may also work directly with the national government, supporting activities such as development of risk reduction and preparedness plans, building

state disaster management institutions, and funding-related initiatives.

In addition to international actors, domestic governments may learn from the activities of their neighboring states. Particularly where countries in the same region face similar natural hazards, the disaster preparedness activities of one country may serve as an example to their peers. Under these circumstances, countries where state leaders are exposed to more developed natural disaster programs in nearby states may also exhibit greater investments in disaster risk management.

This study thus collects and evaluates information to examine whether the involvement of external actors in disaster-related activities is associated with stronger national disaster preparedness programs, and if so, how.

Through this methodology, using qualitative empirical evaluation of largely untested explanations of disaster investment in five country case pairs, this research offers a unique and comprehensive perspective on the factors influencing national government policies to invest in disaster management capacity. 🌍

ENDNOTES

- 1 A full report on these case studies is planned for release in summer 2013. See "Institutional Capacity for Natural Disasters: Case Studies in Africa," *Student Working Paper No. 6* (Austin: Robert S. Strauss Center for International Security and Law, forthcoming). A synopsis of findings and analysis from this report is available in "Institutional Capacity for Natural Disasters: Findings from Case Studies in Africa," *CCAPS Research Brief No. 10* (Austin: Robert S. Strauss Center for International Security and Law, 2013).
- 2 It is important to clarify that natural hazards are physical processes, but whether or not exposure to a hazard becomes a disaster depends a great deal on the social and political circumstances in a country. It is these social and political dynamics that are the primary focus of this study.
- 3 Resulting country scores and other findings are provided in Jennifer Bussell, "Institutional Capacity for Natural Disasters: Findings from Case Studies in Africa," *CCAPS Research Brief No. 10* (Austin: Robert S. Strauss Center for International Security and Law, 2013).
- 4 Rashcky, Paul A. and Manijeh Schwindt, "Aid, Natural Disasters, and the Samaritan's Dilemma," *World Bank Policy Research Working Paper 4952* (Washington: The World Bank, 2009); Vordzorgbe, Seth Doe, "Making the Case for Disaster Risk Reduction in Africa," *United Nations International Strategy for Disaster Reduction (UN/ISDR) Africa paper* (Nairobi: UN/ISDR, December 2006).
- 5 To provide the broadest possible set of perspectives, the research team utilized a snowball sampling approach that began with multiple initial starting points in each country and resulted in a wide range of respondents, including politicians, government officials, non-governmental organization representatives, academics, and individual citizens.
- 6 For a detailed discussion on the limits of quantitative research for evaluating national disaster management policies, please see the Introduction to the full report for this project. See "Institutional Capacity for Natural Disasters: Case Studies in Africa," *Student Working Paper No. 6* (Austin: Robert S. Strauss Center for International Security and Law, forthcoming).
- 7 World Bank and United Nations, *Natural Hazards, UnNatural Disasters: The Economics of Effective Prevention* (Washington: World Bank, 2010), 3.
- 8 Jaiswal, Kishor and David Wald, "An Empirical Model for Global Earthquake Fatality Estimation," *Earthquake Spectra* 26, 4 (2010): 1017-1037.
- 9 Field research included interviews with more than 125 individuals in the ten case study countries from December 2011 to January 2012. Researchers used semi-structured interviews to focus discussions with respondents on data collection to test these hypotheses but also to allow for flexibility across individual cases.
- 10 For each category of hypotheses there is a primary hypothesis and a number of sub-hypotheses, which may or may not logically agree with the primary hypothesis but are concerned with similar issues.
- 11 The hypothesis scores and other findings are provided in "Institutional Capacity for Natural Disasters: Findings from Case Studies in Africa," *CCAPS Research Brief No. 10*.
- 12 See, e.g., Consortium of Non-Traditional Security Studies in Asia (NTS), "Disaster Risk Reduction (DRR): Reducing Human Vulnerabilities to Natural Disasters," *NTS Alert* Issue 1, Sept 2010; International Environment and Disaster Management Laboratory, CITYNET, Tokyo Development Learning Center, Sustainable Environment and Ecological Development Society, and UNISDR Asian Regional Task Force on Urban Risk Reduction, "Climate Disaster Resilience Initiative: Capacity-building Program" (Kyoto: Graduate School of Global Environmental Studies, 2010); Entrepreneurship Development Institute (EDI), "Disaster Risk Reduction and Climate Change Advocacy Strategy" (Nairobi: Oct 3, 2010); and National Disaster Management Commission (Liberia) and United Nations Development Programme, *Capacity Needs Assessment in Disaster Risk Reduction: County, District, and Community Assessment* (Monrovia: UNDP, July 2009).
- 13 Cohen, Charles and Eric Werker, "The Political Economy of 'Natural' Disasters," *Journal of Conflict Resolution* 52, 6 (2008): 795-819; Keefer, Philip, "Disastrous Consequences: The Political Economy of Disaster Risk Reduction," paper commissioned by the Joint World Bank – United Nations Project on the Economics of Disaster Relief, 2009; Keefer, Philip, Eric Neumayer, and Thomas Plumper, "Earthquake Propensity and the Politics of Mortality Prevention," *World Development* 39, 9 (2011): 1530-1541.
- 14 While earthquakes are not directly climate-related, they are relevant for this study's broader considerations for two primary reasons. First, governments typically do not distinguish between earthquakes and other types of natural disasters in disaster risk management activities. Second, from a methodological standpoint, the magnitude of earthquakes is easier to measure than other types of natural shocks, allowing for the most precise analyses of the relationship between preparedness and disaster outcomes.
- 15 Keefer et al. 2011: 1531
- 16 World Bank Sustainable Development Department, *Making Development Climate Resilient: A World Bank Strategy for Sub-Saharan Africa* (WB Report No. 46947-AFT, 2009), xviii.
- 17 Keefer 2009: 1.
- 18 Kahn, Matthew, "The Death Toll from Natural Disasters: The Role of Income, Geography, and Institutions," *Review of Economics and Statistics* 87, 2 (2005): 271-84.
- 19 Keefer 2009.
- 20 Keefer et al. 2011.
- 21 Keefer et al. 2011: 1531; see also Keefer 2009 and World Bank and United Nations 2010: 8.
- 22 Cohen and Werker 2008: 797.
- 23 Healy, Andrew and Neil Malhotra, "Myopic Voters and Natural Disaster Policy," *American Political Science Review* 103, 3 (2009): 387-406.
- 24 Keefer 2009: 8.
- 25 Healy and Malhotra 2009; Keefer 2009.
- 26 Keefer 2009.
- 27 Escaleras, Monica, Nejat Anbarci, and Charles Register, "Public Sector Corruption and Major Earthquakes: A Potentially Deadly Interaction," *Public Choice* 132, 1 (2007): 209-230.
- 28 Evans, Peter and James E. Rauch, "Bureaucracy and Growth: A Cross-National Analysis of the Effects of "Weberian" State Structures on Economic Growth," *American Sociological Review* 64, 5 (1999): 748-765.
- 29 Geddes, Barbara, *Politician's Dilemma* (Berkeley: University of California Press, 1994); Haggard, Stephan, "Reform of the State in Latin America" in Shahid Javed Burki, et al., eds., *Development in Latin America and the Caribbean* (Washington: World Bank, 1997).
- 30 Cohen and Werker 2008: 797.
- 31 Keefer 2009: 21.
- 32 Raschky and Schwindt 2009.
- 33 Cohen and Werker 2008.
- 34 MacLean, Lauren M., "State Retrenchment and the Exercise of Citizenship in Africa," *Comparative Political Studies* 44, 9 (2011): 1238-1266; Brass, Jennifer N., "Blurring Boundaries: The Integration of NGOs into Governance in Kenya," *Governance* 25, 2 (2012): 209-235.
- 35 Allen, Katrina M., "Community-based Disaster Preparedness and Climate Adaptation: Local Capacity-building in the Philippines," *Disasters* 30, 1 (2006): 81-101.

APPENDIX

This study sought to test the range of existing explanations posited in academic and policy literature regarding national investments in disaster management capacity. Field research gathered empirical evidence to test seven primary explanations, each associated with several related sub-components.

PERCEIVED RISK

If governments perceive that the risk of a natural hazard is high, then they will invest more in preparedness.

- If a country has experienced more natural hazards/disasters in the past, then the government will invest more in preparedness.
- If a country anticipates more natural hazards in the future, then it will invest more in preparedness.
- If a country (or region) is small, then it will invest more in preparedness (given the greater threat of a hazard to the country's overall welfare). This encompasses an argument about local areas being more likely to invest in preparedness than central governments.
- If a country is at risk of large natural shocks (but not necessarily frequent), then it will be more likely to invest in preparedness.
- If the at-risk population is concentrated in smaller areas, less money will be required to offer them the same level of protection, and so less will be spent. This half-conflicts with the smaller country will spend more theory, but only in the geographic sense.
- If the at-risk population is wealthier or more productive than the national average, then more money will be spent on DRR to protect them and their contribution to the economy/tax base. If they are a drain on resources, less will be spent.

ECONOMIC STRENGTH

If a country has resources to spend on disaster preparedness, then it will be more likely to spend in this area.

- If a country has a higher GDP, then it will be more likely to spend on preparedness.
- If a country receives a large amount of international aid, then it will be more able to spend on preparedness. This contrasts with the foreign aid argument.
- If there is a vibrant market economy, then there will be more investment in preparedness. This will be due to: Market actors pressuring the state to protect their own investments or market actors engaging in their own preparedness activities.
- If a country is constrained in its spending, and preparedness is seen as a substitute to development spending, then the government will spend less on preparedness.

ELECTORAL INCENTIVES AND DEMOCRACY

If a government perceives disaster preparedness to be electorally beneficial, then it will spend on preparedness.

- If events are rare, then governments will not invest in preparedness, because efforts will be hard to measure and thus electoral benefits will be limited.
- If a government has differing support across regions of a country (including from particular ethnic groups), then it will invest more in preparedness in areas dominated by its supporters.
- If politicians perceive that citizens respond more to disaster response than to preparedness, then they will spend less on preparedness and will spend more if a natural disaster happens.
- If the media gives more attention to preparedness activities (thereby increasing the likelihood of an electoral benefit), then governments will invest more in preparedness.
- If preparedness spending has spillovers into areas that are likely to help politicians electorally, then they will be more likely to invest in preparedness.
- If the population suffers from an acute natural shock, then they are less likely to hold the government responsible than they are for slow-onset disasters, and so governments will invest less in being ready for more acute shocks.
- If a government is in a country with a more advanced democracy, then it will invest more in preparedness.
- If there are competitive elections in a country, then the government will be more likely to invest in preparedness because it is more likely to be held accountable by the population.

POLITICAL DEVELOPMENT

If a government is more developed (in terms of the quality of its bureaucracies and the quality and independence of bureaucrats), then it will prepare more for disasters.

- If a country's politicians are more corrupt and if international aid flows are more easily diverted into rents than preparedness funds, then the government will be less likely to invest in preparedness.
- In general, if a country has more corrupt politicians and bureaucrats, then they will invest less in preparedness.
- If government agencies are largely insulated from politics, then they will be more likely to engage in preparedness activities.
- If local officials, who have more first-hand knowledge of and exposure to risks, are in control of budgets and projects, then the country as a whole will spend more on preparedness.

FOREIGN AID

If governments anticipate that other actors will spend on preparedness or response, then they will spend less on preparedness.

- If a country expects international aid in response to a natural hazard, then it will invest less in preparedness.
- If a country believes that its security situation would deter effective external aid, especially on the ground, then it will invest more in preparedness.

CIVIL SOCIETY

If there is a strong civil society, then there will be greater investment in preparedness.

- If civil society actors pressure the state to invest in preparedness, then the state will invest more.
- If there is a strong civil society, then civil society actors will engage in their own preparedness activities.
- If there are strong local kinship networks, then local actors will invest more in preparedness.

EXTERNAL ACTORS

If a government has greater exposure to disaster preparedness from the actions of external actors, then it will invest more in preparedness.

- If a state is proximate to states that are investing in preparedness, then it will invest more in preparedness.
- If a state has more exposure to IOs and NGOs that promote preparedness, then it will invest more in preparedness.

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POLITICAL STABILITY

THE UNIVERSITY OF TEXAS AT AUSTIN
2315 RED RIVER STREET, AUSTIN, TEXAS 78712
PHONE: 512-471-6267 | FAX: 512-471-6961
CCAPS@STRAUSSCENTER.ORG
STRAUSSCENTER.ORG/CCAPS

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