Extreme Weather Events and the Support for Democracy

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Abstract

Climate change and the erosion of democratic norms are two of the most important global challenges. This paper establishes a relationship between individuals' beliefs for what type of political system should govern their country and extreme weather events, such as droughts. I do so in the context of sub-Saharan Africa, a region highly susceptible to climate change and where democratic norms are not firmly entrenched. I analyze the issue by combining Afrobarometer data on the support for democracy from 2002 to 2015 for 129,002 individuals across 16 countries with granular weather data from 1960 to 2015 across 27km × 27km grid cells. I find that exposure to a drought reduces the support for democracy by 2.56% to 5.28%. I next isolate one (of many possible) channel(s) driving the result. Specifically, I explore the extent to which this weakening of democratic norms relates to exposure to non-democratic systems of governance, as proxied by households' proximity to development projects that are either funded by technocrats (World Bank) or autocrats (China). I find that the impact of droughts on the support for democracy only exists for individuals exposed to non-democratic systems of governance. I end the paper by providing suggestive evidence that this reduction in the support for democracy is associated with a reduction in riots and conflict events more broadly. My findings shed light on the political costs of climate change in developing countries.

Keywords: climate change, support for democracy, non-democratic systems.
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1 Introduction

How do people form beliefs about the political governance system that they want to live in? Given that populist governments are gaining increasing traction globally, while support for democracy is falling and political polarization is rising (Guriev and Papaioannou, 2022), this question is once again at the forefront of the research frontier.

A prominent hypothesis, the "modernization theory," argues that economic development (in the form of higher incomes and more education), pushes a country towards democracy (e.g., Lipset, 1959; Huber et al., 1993) and that higher levels of development reduce the likelihood of democratic reversal (e.g., Lipset, 1959; Przeworski and Limongi, 1997). Other scholars argue that economic downturns contribute to democratization (e.g., Haggard and Kaufman, 1995; Acemoglu and Robinson, 2001).[1] Empirically, there is support for both views. For example, Barro (1999) argues that higher standards of living are associated with higher levels of democracy.[2] On the other side, Brückner and Ciccone (2011) provide empirical support that recessions can lead to "democratic windows of opportunity."[3] This literature evidently addresses the initial question from a "macroeconomic perspective," i.e., it focuses on regime changes. There is a much smaller literature taking a "microeconomic perspective," i.e., focusing on individual beliefs. This literature, analyzing the determinants of the support for democracy, argues that this support is acquired by experiences with democracy over time (e.g., Fuchs-Schündeln and Schündeln, 2015; Claassen, 2020*b*; Acemoglu et al., 2021; Tabellini and Magistretti, 2022).[4]

This paper extends this latter literature by establishing a relationship between individuals' beliefs for what type of political system should govern their country and climate change. Climate change is one of the most urgent policy challenges worldwide. Anthropogenic climate change has increased temperatures by 1.3 degrees Celsius from 1900 to 2010, affecting the frequency and severity of extreme weather events, such as droughts or floods (IPCC, 2021).

The theory of change motivating the idea of the paper is straightforward. There is extensive evidence documenting that weather shocks have large economic impacts on people's lives (e.g.,

[1] There are other theories of democratization, e.g., the "conditional modernization theory" (Treisman, 2020).

[2] Acemoglu et al. (2008) show that once one accounts for unobserved country-level characteristics (country-level fixed effects) in these types of studies, there is no causal relationship between income and democracy.

[3] The robustness of this finding has been questioned by Barron et al. (2014).

[4] This is related to the notion of "democratic capital", introduced by Persson and Tabellini (2009), who argue that a nation's historical experience with democracy reduces the probability that it exits from democracy.

Dell et al., 2014; Carleton and Hsiang, 2016). These changes in individuals' economic conditions may affect people's beliefs about the political governance system that they want in their country. Put differently, climate shocks affect exactly the economic circumstances that the literature has suggested lead to "democratization" (e.g., Lipset, 1959; Acemoglu and Robinson, 2001).

The paper empirically investigates this relationship in sub-Saharan Africa (SSA). SSA provides an interesting empirical setting for studying this relationship. The region is particularly vulnerable to climate change and is already experiencing large negative economic impacts as a consequence (e.g., IDA, 2021). In addition, the slowing rate at which democracy has been adopted in SSA since 2000 coupled with the population's ambivalence towards democracy, raises the possibility that climate change influences the support for democracy.

To measure individuals' support for democracy, I use geolocalized data from five rounds of the Afrobarometer surveys in 16 SSA countries for the period 2002-2015. My main outcome is a dummy indicating whether individuals support democracies or are open to non-democratic systems. Across all countries and survey waves, 68.2% of respondents support democracy.

I proxy climate change by using a long-term measure of droughts: the Standardized Precipitation Evapotranspiration Index (SPEI) developed by Vicente-Serrano et al. (2010). The proxy is based on the scientific consensus that the frequency and intensity of natural disasters is amplified by anthropogenic climate change (IPCC, 2021). The SPEI index is a standardized and continuous drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. The index therefore captures both droughts and floods.[5]

To identify the effect of droughts on the support for democracy, I regress the support for democracy on the drought index, controlling for grid cell and month-by-year of the survey interview fixed effects and various household-level characteristics.

In the first part of the paper, I establish a robust relationship between extreme weather events and the support for democracy. My baseline finding is that a drought reduces the support

[5]The key idea behind the SPEI index is that the impact of precipitation on agriculture depends not only on the level of precipitation, but also on the soil's ability to retain water. This ability is a function of a variety of other weather inputs, such as temperature, sunshine exposure, latitude, wind speed, and pressure. The SPEI index incorporates all of these inputs and outperforms other indices used to predict crop yields (Vicente-Serrano et al., 2012). The SPEI index is calculated using weather data at the grid cell level with monthly frequency from 1960 to 2015 and is expressed in units of standard deviations from the historical mean. In my sample, the mean (standard deviation) of the SPEI index is 0.475 (0.785), indicating that my sample period is drier than the historical period.

for democracy by 2.56% to 5.28%. I further show that droughts reduce individuals' trust in government and institutions. The effects on the support for democracy and trust only persist in democracies. In autocracies, there are no effects of droughts on political beliefs.

Democracy is a multi-dimensional concept, meaning different things to different people both across and within countries. The overwhelming majority of my sample (43.5%) associate democracy with personal freedom, followed by 10.2% who associate democracy with voting, and 9.90% who associate it with the idea of government by and for the people. Only 3.90% of respondents associate economic development with democracy.

I show that in response to droughts, respondents are more likely to want one man rule (i.e., to want a dictator) and one party rule (i.e., to abolish parliament and elections). Since elections, a parliament, and a leader/president with some constraints on their power are cornerstones of a democracy, the respondents' answers indicate that they want a consolidation of power in their country's politics in response to a drought. Given that droughts reduce democracy and given that 43.5% of the sample associate democracy with personal freedoms, it is not surprising that droughts also reduce the freedom of speech, the freedom to join any organization, and the freedom to vote. To interpret this result, I rely on the results just discussed on the desire for more consolidation of power within a country's politics. A logical continuation of this result is a loss in freedoms (e.g., if a country abolishes elections, there is no more freedom to vote). A way to interpret the "freedom findings" is therefore that individuals deliberately give up some freedom in exchange for a less democratic country if, for example, they believe that "less democracy" is better at dealing with climate change.

My findings hold for a variety of robustness checks. My estimations rely on three primary assumptions: (a) the exogeneity of the drought index, (b) homogeneous treatment effects (e.g., De Chaisemartin and d'Haultfoeuille, 2022*b*; Roth et al., 2023), and (c) no selected sample. The first assumption assumes that the weather is random conditional on geography and time fixed effects. The fact that the weather is random (within a place and time) has been a long-established result in the literature. The second assumption assumes that the treatment effect is constant across all 16 countries and five survey waves. I show that my results are robust to allowing for heterogeneous treatment effects. The assumption of no selected sample refers to the possibility that: (i) natural disasters can affect the roll out of the Afrobarometer surveys,

(ii) conditional on the roll out of the surveys, the Afrobarometer interviews different "types" of individuals, and (iii) individuals exhibit adaptation behavior (e.g., they migrate) due to natural disasters and thus change the composition of the sample. I show that these considerations do not represent concerns in my analysis.

In the second part of the paper, I dive into the question of what channel is driving the main result. The theory of change proposed in the beginning of this paper emphasizes a channel via income based on prominent theoretical papers such as Lipset (1959) or Acemoglu and Robinson (2001). However, the list of possible channels driving the baseline result is more likely to be (almost) endless. For example, it is widely known that weather variations affect conflict, which may very well in turn affect respondent's support for democracy. My aim is therefore not to identify *the* channel driving the results but to parse out *a* channel driving the result.

I start by showing that my baseline finding from the first part of the paper is homogeneous across a wide range of dimensions: for example, the impact is the same for poor and rich individuals, for those exposed and not exposed to conflict, and for those with differing levels of education. The lack of heterogenous effects of droughts on the support for democracy across these dimensions motivates me to focus on another channel altogether.

Specifically, I inquire whether the exposure to non-democratic systems is a channel driving the results. I proxy this exposure by exposure to development projects funded by the World Bank and China, the former being technocratic and the latter being autocratic.

The motivation for focusing on this channel comes from a growing, albeit very inconclusive, literature evaluating the relationship between the presence of foreign aid and political attitudes. For example, Bai et al. (2022) show that Chinese infrastructure aid significantly increases positive attitudes towards the government in the region where the aid was implemented. While Eichenauer et al. (2021) and Blair et al. (2022) find no evidence that exposure to Chinese development projects in, respectively, Latin America and Africa increases attitudes towards China, Wellner et al. (2022) show that exposure to Chinese development projects can increase the support for China. Most closely related to this paper, Freytag et al. (2024) show that exposure to Chinese development aid in Latin America is associated with an increase in democratic values.

The hypothesis I test is whether the interaction of a drought and the exposure to a development project is the driving force that explains the observed reduction in the support for

democracy. To be precise, I posit that a "cultural transmission" occurs due to this exposure to non-democratic systems of government. In other words, the mechanism underlying this channel is not (for example) an economic one, i.e., it is not an economic benefit (or lack thereof) of a development project that is relevant in mediating the impact of a drought. I argue that the exposure to these non-democratic systems per se is relevant in explaining the variation in the support for democracy when interacted with the exposure to a drought.

I find that respondents exposed to non-democratic systems of governance experience a decrease of 3.03% to 5.59% in their support for democracy after a drought. In contrast, the relationship between droughts and the support for democracy disappears for individuals not exposed to non-democratic systems of governance.

Because development projects are unlikely to be randomly allocated throughout SSA, likely targeting areas with particular characteristics (like poorer areas), one might worry that my results conflate other mechanisms. Examples include exposure to conflict or the income/wealth, health or education levels of the local population.

I implement three main tests to mitigate this concern. First, I test whether droughts impact the support for democracy for respondents who are not exposed to development projects at the time of the interview but who will be exposed to them in the future. I find no support for this. Areas that receive a project only after experiencing a drought do not exhibit any relationship between climate change and the support for democracy. In addition, if projects target certain types of areas, and certain characteristics of these areas drive the overall results, the drought index in these areas with these future development projects would display significant effects. Therefore, this test rules out local conditions as a potential mechanism.

Second, I rely on a doughnut design. The premise of this idea is that if the exposure to alternatives to democracy (i.e., the presence of official development assistance (ODA)) is orthogonal to some x, then this x cannot be a mechanism because the relationship between climate change and the support for democracy only exists for individuals exposed to alternatives to democracy. This simple insight rules out a whole range of possible mechanisms. To assess this empirically, I show that development projects correlate with various potential mechanisms, such as employment/income, in a radius of at most 10km around the development project. Thereafter, the presence of the development projects no longer correlates with local conditions. Replicating the

main result while excluding individuals who live within a 10km radius of a development project therefore serves as a test whether I am conflating these potential mechanisms and exposure to non-democratic systems as mechanisms. I find no support for this, thus providing further evidence that local conditions do not act as potential confounders.

Third, I show that the results are not driven by development projects in particular sectors. This is further evidence that development projects do indeed act as proxies for exposure to non-democratic systems of governance and are not capturing a particular need of some people which may be driving the result.

Taken together, the evidence presented suggests that these development projects do indeed proxy exposure to non-democratic systems of governance and are not conflating other potential mechanisms.

Finally, in the third part of the paper I provide suggestive evidence that the reduction in the support for democracy is associated with a reduction in riots and conflict events more broadly. While droughts significantly increase conflict in general, this effect becomes insignificant for individuals exposed to Chinese or World Bank projects. This is in line with the findings in Gehring et al. (2022) who show that Chinese and World Bank development projects reduce conflict occurrences and increase stability. For riots the relationship is even more extreme as individuals exposed to development projects are less likely to partake in riots in responses to droughts. This goes against the idea in Acemoglu and Robinson (2001) who argue that individuals may be more likely to protest to advance democracy ("threaten revolution") when the opportunity cost is low, which is likely the case during a drought (recession).

The paper contributes to various strands of the literature. Most closely, this paper relates to the "microeconomic literature" analyzing the determinants of the support for democracy (Fuchs-Schündeln and Schündeln, 2015; Claassen, 2020*b*; Acemoglu et al., 2021; Tabellini and Magistretti, 2022).[6] I contribute to this literature in two ways. First, I consider a new determinant for the support for democracy: climate change. Second, when thinking about the channel that drives this relationship, I provide evidence that channels other than the "obvious income mechanism" are (also) important in understanding the relationship between the climate and the

[6]Canonical theories of democratization in political science hinge on the support for democracy within the population (e.g., Lipset, 1959; Almond and Verba, 1963; Easton, 1965), thus emphasizing the importance of studying the "microeconomic perspective." For empirical evidence, see Claassen (2020*a*).

support for democracy. This latter point is crucial in that it highlights (a) how only focusing on income as a mechanism can miss parts of the story and (b) how identifying the effects of weather shocks on the political variables via a 2SLS design can be misleading (Brückner and Ciccone, 2011).

More broadly, the paper contributes to a literature linking weather shocks to political outcomes. The most widely studied outcomes are voting outcomes (e.g., Malhotra and Kuo, 2008; Healy and Malhotra, 2009; Healy et al., 2010; Cole et al., 2012; Amirapu et al., 2022), though some papers do look at trust in government (e.g., Alfano and Aboyadana, 2020; Balcazar and Kennard, 2022) or even social capital/cultural persistence (e.g., Buggle and Durante, 2021; Giuliano and Nunn, 2021). I contribute to this literature by analyzing a new type of outcome: the support for democracy. This is importance because (a) democratic norms around the world have been eroding and (b) electoral data in developing countries can be inaccurate and beliefs can signal future votes, providing useful information for policy makers. Furthermore, most of this literature, especially in developing countries, argues that the main mechanism is one through income or agricultural productivity (Cole et al., 2012; Amirapu et al., 2022). In contrast, my results highlight a different channel that does not operate via income or respondents' economic circumstances more broadly.

Finally, the paper relates to a large literature analyzing the drivers of people's political beliefs.[7] In particular, my paper builds on the strand in this literature looking at how exposure to foreign influences drives political outcomes (e.g.,. Meyersson et al., 2008). The emergence of China as an important global player has led to a growing literature studying the effects of Chinese foreign aid. Researchers have studied the impact of Chinese aid on (i) the behavior of traditional lenders such as the World Bank (Hernandez, 2017; Humphrey and Michaelowa, 2019; Zeitz, 2021; Watkins, 2022; Kern et al., 2024), (ii) economic and political outcomes (Isaksson and Kotsadam, 2018*a*,*b*; Bluhm et al., 2018; Dreher et al., 2019; Martorano et al., 2020; Dreher et al., 2021; Mueller, 2022), and (iii) political beliefs (Kleinberg and Fordham, 2010; Hanusch, 2012; Eichenauer et al., 2021; Bai et al., 2022; Blair et al., 2022; Wellner et al., 2022; Freytag et al., 2024). I contribute to this third literature in two ways. First, I show that political

[7]For an overview looking at the burgeoning literature analyzing people's understanding of economic policies, see Stantcheva (2023). For an example related to climate change policies, see Dechezleprêtre et al. (2022).

characteristics of aid donors, interacted with climate change, are important determinants of the beliefs about democracy in SSA, highlighting effects of foreign aid not studied yet. Second, by showing that climate change interacted with foreign aid reduces the support for democracy, I add a new negative externality to the list of potential concerns associated with the effects of foreign aid. Importantly, I provide evidence that this negative impact of climate change on the support for democracy for individuals exposed to development projects does not occur because of some economic effect of the project. Instead, the negative externality occurs because of the presence of this non-democratic system of governance itself. This is a type of externality the literature has not yet considered.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 establishes a robust relationship between extreme weather events and the support for democracy and presents all the robustness checks. Section 4 discusses the exposure to non-democratic systems of governance as the main mechanism. Section 5 demonstrates that the documented effects on beliefs in previous sections translate into effects on tangible outcomes, with a particular focus on conflict. Section 6 concludes and offers new avenues for future work.

2 Data

Afrobarometer data. To measure the support for democracy across SSA, I rely on the Afrobarometer surveys. These nationally representative surveys, conducted approximately every three years in a variety of African countries, contain a plethora of information regarding Africans' political preferences, social capital, economic conditions, as well as other topics. In each country-survey wave, interviews are conducted in the local language with a (random) sample of either 1,200 or 2,400 individuals.

This paper uses geocoded data from 16 SSA countries that were surveyed in all rounds from round 2 to round 6 (2002—2015), providing me with a sample of 129,002 individuals, representing 51.7% of the SSA population.[8] I match the locations of individuals to weather grid

[8]The countries are Botswana, Cape Verde, Ghana, Kenya, Lesotho, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. The reason for restricting the sample to 16 countries is that they are the only ones surveyed in all five survey rounds.

cells, which are described in more detail below.[9,10]

The precise question respondents were presented with is "Which of these three statements is closest to your own opinion? A: Democracy is preferable to any other kind of government. B: In some circumstances, a non-democratic government can be preferable. C: For someone like me, it doesn't matter what kind of government we have." I use this question to code two different versions of the outcome used in this paper. First—coding 1—I create a dummy variable that equals 1 if participants answer "A" (i.e., they support democracy) and 0 if they answer "B" (i.e., they are open to non-democratic regimes). Second—coding 2—I create a dummy variable that equals 1 if participants answer "A" (i.e., they support democracy) and 0 if they answer "B" or "C" (i.e., they are open to non-democratic regimes or indifferent) or "don't know".[11]

The first row in Panel A of Table 1 displays the share of individuals who support democracy, showing that 85.9% of individuals support democracy across my full sample (Column 1) and that this share does not vary much across different regions in Africa (Columns 2—4). To delve into the geographical distribution of this support for democracy in more detail, Panels A and B of Figure 1 plots that same share at the state level for survey rounds 2 and 6 separately. While the overall support for democracy is quite high throughout, there is some variation that suggests, for example, that landlocked regions in southern and eastern Africa exhibit higher support for democracy than non-landlocked regions. All these shares are conditional on not picking option

[9]At the time of writing (May 7, 2024), only survey rounds 1 through 6 have been geocoded. Since the wording of questions in survey round 1 differs substantially from that in other rounds, I exclude that round. Furthermore, in round 2, I lose 797 observations in Senegal as the date of those interviews is not known.

[10]Geocoded Afrobarometer surveys provide researchers with the location of an "Enumeration Area" (EA), i.e., the primary sampling unit (PSU). The precision of this PSU depends on the size of the EA, which varies between different population densities, but usually represents a village (or a several geographically close villages) or a neighborhood in an urban area. Each geocoded location is associated with a precision code ranging from 1 (most precise) to 8 (least precise). 98.46% of observations have precision codes between 1 and 4. As this is pretty much the complete sample (except for 1,986 observations), I keep the full sample in my main analysis. All results presented in this paper are robust to restricting the sample to precision codes 1 through 4. For more information on the process of geocoding the Afrobarometer data, see BenYishay et al. (2017).

[11]This question is unique in that it asks respondents directly about their belief whether democratic or non-democratic regimes are better. It does, to my knowledge, not exist in this form in any other survey. It is most closely related to the "democracy better" variable used in Tabellini and Magistretti (2022), which asks respondents to agree or disagree with the statement "Democracy may have problems but it's better than any other form of government." While similar in spirit, there is a subtle difference between the two questions. The Afrobarometer neutrally presents respondents with two alternatives, namely democratic or non-democratic regimes. It does not imply that one is better than the other. The "democracy better" variable suggests that democracy is flawed and then asks individuals to agree or disagree with this statement. This suggestion that democracy is flawed can influence respondents' answers. The Afrobarometer thus presents a unique opportunity to analyze respondents' answers to a simple straightforward question about their support for democracy.

"C" (i.e., coding 1 of the outcome) or answering "don't know." As Panel A in Table 1 shows, 20.6% of respondents choose option "C" or answer "don't know." It follows that 68.2% of the sample support democracy unconditionally (as shown in the second row of Panel A in Table 1).

I conduct my main analysis relying on coding 1 of the outcome. I view this as the most conservative approach, as it relies on individuals who display strict preferences over which alternative is better. Indifferent individuals, or individuals who may not have views on political systems at all, are therefore excluded from the analysis. I show that the main result of the paper also holds for coding 2 of the outcome.

Democracy can, and likely does, mean different things to different people both across and within countries. Understanding what respondents perceive democracy to be is therefore important. To this end, Panel B of Table 1 displays the four answers to a question in the Afrobarometer asking individuals "what does democracy mean to you?". They are (i) personal freedoms (43.5%), (ii) government for and by the people (9.99%), (iii) voting (10.2%), and (iv) economic development (3.90%). Two facts are worth highlighting: (i) individuals seem to hold an overwhelmingly positive view of democracy and (ii) close to no one associates democracy with economic development. The second point suggests that in this context income/economic development may not serve as a mechanism when considering the relationship between droughts and the support for democracy, something I will return to multiple times throughout the paper.

Panels C and D in Table 1 and Table 2 provide further summary statistics for various political variables. First, Panel C of Table 1 displays variables relating to personal freedom, showing that 76.9%, 81.8%, and 84.3% of respondents perceive that they are free to, respectively, speak their mind, join any political organization, and vote. Second, Panel D of Table 1 provides the shares of respondents who do not support one-party rule, army rule, and one-man rule (i.e., abolishing parliament and elections). Table 2 displays three groups of variables relating to trust in government, the capabilities of the government, and trust in institutions. All these measures show that around half of the respondents trust the government, its institutions, and/or view it to be capable in providing various services. Finally, Panel D in Table 2 displays the share of respondents who believe their country to be a full democracy (23.2%), a democracy with minor problems (37.8%), a democracy with major problems (31.2%), or not a democracy (7.7%). For each group of the variables displayed in Panels C and D in Table 1 and Panels A, B, and C

of Table 2, I also construct an index by (a) averaging the dummy variables in each category and (b) standardizing this measure. For the variables in Panel D of Table 2, I create a variable ranging from 1 to 4, where 1 indicates "not a democracy" and 4 indicates "full democracy."[12]

To validate the responses in the survey, Table A3 presents OLS regressions of coding 1 of my main outcome variable on the above-mentioned household characteristics. The table shows that older respondents, respondents who completed at least high school, male respondents, black respondents, religious respondents, and respondents who are politically aligned with the party in power are more likely to support democracy. The respondent's employment status does not correlate significantly with the support for democracy and being white and having an occupation that is affected by climate change correlates negatively with the support for democracy.

Table A4 provides further validation of the responses in the Afrobarometer. The table regresses various answers from the Afrobarometer on the polity score.[13] Column 1, relying on coding 1 of the support for democracy, shows that there is no correlation between this outcome and the "true" level of democracy in a country. Column 2 uses the variable ranging from 1 to 4 measuring how democratic people think their country is (see Panel D in Table 2) to show that people who live in a more democratic country view their country as more democratic. The outcome in Column 3 (4) [5] {6} is an index created from variables in Panel A of Table 2 (Panel C of Table 2) [Panel D of Table 2] {Panel C of Table 1}, as described above. As can be seen, individuals living in more democratic countries display higher trust in government and institutions, view their government as more capable, and believe themselves to be more free. The directions of the significant correlations found in Columns 2—6 validate the Afrobarometer data. The fact that my main outcome in Column 1 is not correlated with the level of democracy in a country is not necessarily surprising. The outcome I am studying is distinct from other, more standard, political outcomes studied (such as the ones in Columns 2—6), i.e., my outcome measures an individual's belief about the "optimal system." There is a priori no reason to believe that such a belief is systematically correlated with the level of democracy in a country.

To show that my main outcome is distinct from other political beliefs, Figure A1 looks at the

[12]The Afrobarometer also contains a battery of individual- and village-level characteristics that can be used as controls and which I've summarized in Tables A1 and A2, respectively.

[13]The polity2 measurement comes from the Polity5 project. This index, widely used in the literature (e.g., Burke and Leigh, 2010; Fuchs-Schündeln and Schündeln, 2015; Besley and Persson, 2019; Tabellini and Magistretti, 2022), ranges from −10 (autocracy) to +10 (democracy).

raw correlations between the support for democracy and a set of other political beliefs found in the Afrobarometer surveys, using only data from the latest survey round. The correlations highlighted in yellow are the correlations of interest, i.e., the ones between the support for democracy and other political beliefs, while the correlations highlighted in orange represent the correlations amongst the other political beliefs. The figure clearly highlights that the correlations between political beliefs other than the support for democracy are much higher than the correlation between the support for democracy and these political beliefs. For example, the correlation between trust in the president and trust in parliament is 0.575, while the correlation between the support for democracy and these two beliefs is 0.073 and 0.054, respectively. If the support for democracy were capturing individuals' view of the government instead of their support for democracy, the correlations in the yellow part of the figure should be higher.

Weather data. As measuring climate change is inherently difficult, my focus here is on droughts. The rationale behind this is based on the scientific consensus that the frequency and intensity of natural disasters is amplified by anthropogenic climate change (IPCC, 2021).[14] A drought is a "temporal anomaly characterized by a deficit of water compared with long-term conditions" (Peng et al., 2020) that can be grouped into one of five types: meteorological (precipitation deficiency), agricultural (soil moisture deficiency), hydrological (runoff and/or groundwater deficiency), socioeconomic (social response to water supply and demand) and environmental or ecological (Mishra and Singh, 2010; Peng et al., 2020).

To identify droughts, or drought-like conditions, my main right-hand side variable is the SPEI index, developed by Vicente-Serrano et al. (2010).[15] The SPEI index is a standardized and continuous drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. More specifically, the impact of precipitation on agriculture not only depends on the level of precipitation, but also on potential evapotranspiration (PTE),[16] i.e., the soil's ability to retain water. PTE is a function of a variety of other

[14]Examples of work looking at political outcomes include papers analyzing the effects of tornadoes (e.g., Healy et al., 2010), hurricanes (e.g., Malhotra and Kuo, 2008; Fitch-Fleischmann and Kresch, 2021), droughts (e.g., Tarquinio, 2022), earthquakes (e.g., Klomp, 2020; Pathak and Schündeln, 2022), or floods (e.g., Besley and Burgess, 2002; Cole et al., 2012; Kosec and Mo, 2017; Neugart and Rode, 2021).

[15]To ease the interpretation of my results, I multiply the final index by -1.

[16]PTE is the amount of evaporation that would occur if a sufficient water source were available.

weather inputs such as temperature, sunshine exposure, latitude, wind speed, and pressure. The SPEI index incorporates all of these components and has been found to outperform other indices in predicting crop yields (Vicente-Serrano et al., 2012).[17,18]

I rely on the daily ERA5 reanalysis dataset from the European Center for Medium-Range Weather Forecasts for the weather inputs to calculate the SPEI index, downloading the data from 1960 until 2015 for a 0.25×0.25 degree (≈ 27×27km) grid spanning the world.[19]

The SPEI index is calculated for each grid cell-month and is expressed in units of standard deviations from the grid cell's historical mean. By construction it therefore has mean (standard deviation) 0 (1) in the historical sample, which in my case is 1960-2015. In my sample, the mean (standard deviation) of the SPEI index is 0.475 (0.785), indicating that my sample period (2002-2015) was both drier and exhibited less variability than the historical period.

Present drought conditions are not only a function of current weather conditions but also of past periods. The SPEI index can therefore be constructed over different timescales. This paper relies on the 12 months SPEI index which reflects long-run climatic conditions. The reasons for this choice are twofold. First, given my interest in the effects of climate change (i.e., a long-run event), it is imperative to focus on a SPEI index capturing long-run deviations from the historical mean. Second, individuals' recollection period is not infinite. As such, while I could compute the SPEI index for any other months, limiting the "recall period" is important. I choose 12 months in my main specification.

Notwithstanding its continuous nature, researchers have categorized the index. Values above 2.00 are classified as being "extremely wet", values between 1.50 and 1.99 are "very wet", values between 1.00 and 1.49 are "moderately wet", values between -0.99 and 0.99 are "near normal", values between -1.00 and -1.49 are "moderately dry", values between -1.50 and -1.99 are "severely dry", and values below -2.00 are "extremely dry". Throughout the paper, I sometimes define

[17]Two of these other indices are the Palmer Drought Severity Index (PDSI) (Palmer, 1965) and the Standardized Precipitation Index (SPI) (McKee et al., 1993). For more information on drought indices, see Mishra and Singh (2010). The details for the calculation of the SPEI index can be found in Vicente-Serrano et al. (2010) and can simply be executed in R using the package "SPEI".

[18]In terms of droughts, climate change has two implications: (i) a decrease in precipitation and (ii) an increase in temperature, which in turn causes an increase in the evapotranspiration rate. The SPEI is therefore "particularly suited to [detect, monitor, and explore] the consequences of global warming on drought conditions" (Vicente-Serrano et al., 2010, p. 1698)).

[19]See Auffhammer et al. (2013) for arguments why using reanalysis data is more suitable than simple gridded datasets such as UDEL or CRU.

extreme weather event dummies. Extreme droughts or floods are classified as "extremely dry" or "extremely wet" in the SPEI categories. Droughts and floods add the categories "severely dry" and "very wet" to the "extreme" categories. (Extreme) disasters are defined to be (extreme) droughts and floods combined. Finally, for expositional simplicity, I call the 12 months SPEI index "drought index" in this paper.

Panels C and D of Figure 1 plot the distribution of the drought index for the grid cells in my data for survey rounds 2 and 6 separately, showing variation both across geography and time. As can be seen, large parts of western Africa, Kenya, Uganda, and Lesotho are the most dry areas in the sample. Other places like Namibia, Zimbabwe, and South Africa, for example, are wet areas, suffering from floods instead of droughts. Furthermore, over time, the graphs get "lighter" (in color), implying that the climate becomes drier.

There is a large literature documenting negative economic impacts of weather variations (e.g., Dell et al., 2014; Carleton and Hsiang, 2016). To this end, Table A5 regresses five potentially climate-affected outcomes on the drought index used in this paper. In Columns 1—3, I rely on three proxies for income available from the Afrobarometer surveys: (positive) economic expectations, food availability, and cash availability.[20] As the table shows, a one standard deviation increase in the drought index (i) reduces individuals' economic expectations by 3.6 percentage points, (ii) reduces food availability by 0.070 points (on a 5 point scale), and (iii) reduces cash availability by 0.069 points (on a 5 point scale). Column 4 presents results relying on yet another proxy for income: the log of nightlights within the grid cell of the respondent.[21] Reassuringly, a drought reduces the luminosity of a grid cell. Finally, in Column 5, I rely on another outcome that is widely documented to be affected by droughts: conflict.[22] As expected,

[20]The Afrobarometer does not have reliable income data, which is why I rely on proxies. The three questions are: (i) "looking ahead, do you expect the following to be better or worse: your living conditions in 12 months time?"—I convert the 5-scale answers provided by respondents into a dummy indicating a positive outlook; (ii) "over the last year, how often, if ever, have you or your family gone without enough food to eat?"—I flip the scale of the answers provided to a variable ranging from 1 to 5 with 1 indicating "always" and 5 indicating "never"; (iii) "over the past year, how often, if ever, have you or your family gone without cash income?"—I flip the scale of the answers provided to a variable ranging from 1 to 5 with 1 indicating "always" and 5 indicating "never".

[21]I download the widely used grid cell level nightlights data from 1992 to 2013 here (last accessed: May 8, 2024).

[22]I download the Armed Conflict Location & Event Data Project (ACLED) database for all years of my sample. I follow Harari and La Ferrara (2018) in defining dummy variables capturing conflict exposure. Specifically, I create two variables: (i) the dummy "battles" indicates having experienced a conflict classified as a battle of any kind (regardless whether control of geographies changes) and (ii) the variable "riots" captures riots and protests and indicates if (public) demonstrations against government institutions take place. In Table A5 I use

droughts increase the probability that a respondent's grid cell is exposed to a battle/conflict event. Overall, Table A5 validates the drought index used in this paper.[23]

The drought index yields a level effect of drought conditions on the support for democracy. With climate change one might, however, also be interested in looking at the effects of higher moments or at nonlinearities.

The premise of this paper relies on the fact that individuals notice changes in the weather and update their beliefs accordingly. As such, these changes must be noticeable. This leaves the level effect and the effect of the variance (or standard deviation) of droughts, i.e., the fact that climate change doesn't just change the intensity of droughts but also affects the frequency and/or likelihood of their occurrence. As already mentioned, the mean (standard deviation) of the SPEI index is 0.475 (0.785) in my sample. This standard deviation is smaller than the one in the historical sample (which is 1). The individuals in my sample are therefore not exposed to more drought variability over time. This renders the context of my study more suited to study level effects.

Figure A2 provides further intuition for this by plotting the 1, 12, 24, and 48-month SPEI index from January 1970 to December 2015 for Dakar, Senegal.[24] Shorter timescales of the index pick up a lot of short-run variation while longer time horizons vary much less. This is why I don't consider nonlinear effects—captured for example by the inclusion of drought or flood dummies—as my main point of interest. I want to capture the effect of long-run changes in drought conditions and these are not only represented by extreme drought dummies, but also by prolonged moderately dry periods, for example. The 12 months SPEI index allows me to capture all of these effects. Notwithstanding this, I show in robustness checks that my main result holds when measuring droughts using dummy variables.

the "battle" dummy as the outcome. The "riot" dummy will be relevant only in section 5.

[23] As the outcomes in Columns 4 and 5 are at the grid cell (and yearly) level, I lag the drought index by one year (i.e., 12 months) to allow the impacts to be visible at this aggregation.

[24] The location is arbitrary. The point is to show inherent features of the different timescales of the SPEI index. These are similar for any location.

3 Main Results

Empirical strategy. To capture the reduced form effect of the drought index on the support for democracy, my main specification looks as follows

$$\text{Support for democracy}_{iegt} = \delta_g + \tau_t + \beta \text{Drought Index}_{gt} + \mathbf{x}_{iegt}\gamma + \epsilon_{iegt} \tag{1}$$

where Support for democracy$_{iegct}$ denotes the outcome variable indicating whether individual i in enumeration area e in grid cell g in year-month t supports democracy or is open to non-democratic regimes. The right-hand side of the equation includes grid cell and month by year fixed effects, the drought index at the grid cell and month by year level, and allows for the inclusion of household level controls.[25] Standard errors are clustered at the grid cell level.[26]

The coefficient of interest in this TWFE regression, β, indicates the percentage point change in the outcome in response to a one standard deviation increase in the drought index. Recall from section 2 that values above 1.5 are considered severely dry and extremely dry and that the mean (standard deviation) of my drought index is 0.475 (0.785). Defining a drought as corresponding to severely and extremely dry conditions, the effect of a drought is therefore equivalent to a two standard deviation increase in the drought index.

Whether this regression succeeds in capturing the causal effect of the drought index on the support for democracy, hinges on at least three important assumptions: (a) the exogeneity of the index, (b) homogeneous treatment effects (e.g., De Chaisemartin and d'Haultfoeuille, 2022*b*; Roth et al., 2023), and (c) no selected sample. The first assumption assumes that the weather is random conditional on geography and time fixed effects. Acemoglu et al. (2002) and Rodrik et al. (2004) argue that long-run climate averages can be associated with changes in institutional quality (hence rendering them endogenous), but that deviations from the long-run mean are not

[25]The controls I include in all regressions are the age of the respondent and dummy variables indicating (a) whether the respondent completed high school or more, (b) whether the respondent is male, (c) whether the respondent is white, (d) whether the respondent is religious, (e) whether the respondent is aligned with the political party in power, and (f) whether the respondent is employed (see Table A1). Controls (d), (e), and (f) are potentially bad controls as they may themselves be affected by the drought index. In robustness tests I show that the results are robust to removing these potential bad controls (and also to removing all controls).

[26]The subscript i is redundant as I only know the enumeration area e an individual lives in. The subscript e clarifies that I merge the enumeration area e to the grid cell g. Specifically, geocoded Afrobarometer data contains the geographic center of each enumeration area e. I merge this information to the relevant grid cell g.

(hence rendering them exogenous). Recall that the drought index is a deviation from a long-run mean, making it exogenous. Given that my main specification relies on the (long-run) 12 months drought index (i.e., it is comparing the weather conditions in the last twelve months to the historical weather), I show, in robustness checks, that the main results also hold when relying on the (short-run) 3 months drought index. The second assumption assumes that the treatment effect is constant across all 16 countries and five survey waves. I show that my results are robust to allowing for heterogeneous treatment effects in robustness tests. The assumption of no selected sample refers to the possibility that: (i) natural disasters can affect the roll out of the Afrobarometer surveys, (ii) conditional on the roll out of the surveys, the Afrobarometer interviews different "types" of individuals, and (iii) individuals exhibit adaptation behavior (e.g., they migrate) due to natural disasters and thus change the composition of the sample. I show that these considerations do not represent concerns in my analysis in robustness checks.

Main results. Table 3 presents the main results, relying on coding 1 (2) of the main outcome in Columns 1 and 2 (3 and 4). Columns 1 and 3 estimate equation (1) and show that, depending on the coding of the outcome, a one standard deviation increase in the drought index decreases the support for democracy by 1.1 or 1.8 percentage points.[27] These effects are statistically significant at the 5% and 1% level, respectively. The next part of the table translates these estimates into percentage effects for one drought. As mentioned above, one drought corresponds to an increase of 2 standard deviations in the drought index. Put differently, this means that one drought alone reduces the support for democracy by 2.56%—5.28%.

Columns 2 and 4 add one- and two-year (i.e., 12 months and 24 months) lags of the drought index to the regressions. While the contemporaneous effects in these regressions are unchanged, the effects fade out after one or two years, depending on the coding of the outcome. The contemporaneous and lagged effects in Column 4 are jointly significant.

Freedom. As discussed in section 2, democracy is a multi-dimensional concept, meaning different things to different people both across and within countries. To this end, Table 4 displays

[27]The precise interpretation is that a one standard deviation increase in the drought index decreases the probability that a respondent answers that they support democracy by 1.1 or 1.8 percentage points. For simplicity, I will refer to this simply as a decrease in the support for democracy throughout the paper.

the effects of droughts on three variables relating to the erosion of democracy (see Panel D of Table 1) and three variables relating to personal freedoms (see Panel C of Table 1). Columns 1 and 3 of the table show that in response to droughts, respondents are more likely to want one-man rule (i.e., to want a dictator) and one-party rule (i.e., to abolish parliament and elections). Since elections, a parliament, and a leader/president with some constraints on their power are cornerstones of a democracy, the respondents answers indicate that they want a consolidation of power in their country's politics in response to a drought.[28]

Columns 4—6 show that droughts reduce the freedom of speech, the freedom to join any organization, and the freedom to vote by, respectively, 4.94%, 3.18%, and 2.85%. Given that droughts reduce democracy and given that 43.5% of the sample associates democracy with personal freedoms, this result is to be expected. To interpret this result, consider the results just discussed on the desire for more consolidation of power within a country's politics. A logical continuation of this result is a loss in freedoms (e.g., if a country abolishes elections, there is no more freedom to vote). A way to interpret the findings in Columns 4—6 is therefore that individuals deliberately give up some freedom in exchange for a less democratic country if, for example, they believe that "less democracy" is better at dealing with climate change.

Trust. Table 5 displays results for the effects of droughts on three further dimensions of democracy: trust in government (Columns 1—3), trust in institutions (Columns 4—6), and capabilities of the government (Columns 7—10). I observe that one drought significantly reduces trust in the president by 11.3%, trust in parliament by 9.71%, and trust in local government by 4.68%. Furthermore, one drought reduces individuals' trust in the police, the courts, and the army by 12.6%, 7.72%, and 5.36% respectively. Finally, in terms of citizens' views of the capabilities of the government, a drought reduces the share of individuals who believe the government can manage the economy and education services by 7.84% and 5.52%, respectively.[29]

[28]Columns 1—3 reassuringly show that individuals are consistent in their answers. Table 3 showed that droughts reduce individuals' support for democracy. The answers in Columns 1—3 of Table 4 show that respondents understand what this decrease in democracy means.

[29]The results on trust in government mirror the findings from the literature (Alfano and Aboyadana, 2020; Balcazar and Kennard, 2022). For example, Balcazar and Kennard (2022) find that temperatures above 3 degrees Celsius decrease trust in political leaders by 2-3 percentage points.

Democracy vs. autocracy. Table 6 shows that the negative effects on the support for democracy and trust in government and institutions documented so far only persist in democracies. Specifically, the table explores heterogeneous effects by expanding equation (1) and adding an interaction term of the drought index and a variable indicating whether the respondent lives in an autocratic country and that variable itself.[30] Column 1 shows that the main effects from Column 1 in Table 3 are unique to democratic countries: in non-democratic systems (autocracies), droughts reduce the support for democracy insignificantly. The outcomes in Columns 2—4 are the democracy index, the trust in government index, and the trust in institutions index described in Tables 1 and 2 and the text in section 2. Similarly to the heterogeneity analysis in Column 1, the negative effects on these indices only exist in democracies.

Two extensions. There are many extensions to the above that one can pursue. I here highlight two that seem of first-order importance. These are not the main subject of the paper and, therefore, should be analyzed in future research in more detail.

Country-level heterogeneities. My sample consists of 16 SSA countries. These countries of course vary in their levels of democracy, state capacity, or economic development. They also vary culturally. While the fixed effects in my analysis take these differences into account (to some degree at least), I here nonetheless estimate equation (1) at the country level. Table A6 shows the results, presenting only the percentage effects of droughts or floods for each country where the effect is significant. The main results from Table 3 mask large country level variations. The table shows that the negative effects of droughts on the support for democracy are driven by Cape Verde, Tanzania, Senegal, Zambia, and Kenya, with effects of one drought implying reductions in the support for democracy of up to 18.1%. In other countries, i.e., Zimbabwe and South Africa, the drought index picks up the effects of a flood. Looking at Figure 1 confirms that these countries are confronted mainly with extremely wet conditions (i.e., floods). Finally, the remaining countries—Botswana, Ghana, Lesotho, Malawi, Mali, Mozambique, Namibia, Nigeria, and Uganda—display no effect of droughts on the support for democracy. There are many possible reasons for this. Note that most of the countries with null effects have large

[30]The variable is created from the polity measurement (see Table A4). Specifically, the dummy is equal to one if a country has a polity score of 0 or less.

negative coefficients implying that droughts do reduce the support for democracy in these areas but that the effect is just not statistically significant.

Cumulative effects. Throughout a lifetime, an individual is unlikely to be affected only by one drought. Indeed, the median individual in my sample is affected by 7 droughts (min=0 and max=16).[31] Panel A of Figure A3 estimates equation (1) but replaces "Drought Index$_{gt}$" with 16 dummy variables indicating whether the respondent has been exposed to 1, 2, 3, ..., 16 droughts, respectively.[32] As can be seen, all dummies have a negative effect on the support for democracy, with the effect clearly increasing with more drought exposure. For the first few droughts the effect is still non-significant but then becomes significant and remains so. For example, the cumulative effect of exposure to 7 droughts for the median individual in the sample is $-0.068(0.045)$, which translates into a 7.95% reduction in the outcome. For individuals exposed to 16 droughts, the effect is $-0.385(0.048)$, which translates into a 44.8% reduction in the outcome. Panel B of Figure A3 repeats this procedure but relies only on extreme droughts, showing an even more extreme pattern.

3.1 Robustness of Main Results

Appendix B presents details of various robustness tests of the main result from Table 3. First, I show that my results are robust to allowing for heterogeneous treatment effects. Second, I explore the possibility that the sample is selected. Specifically, this refers to the possibility that (i) natural disasters affect the roll out of the Afrobarometer surveys, (ii) conditional on the roll out of the surveys, the Afrobarometer interviews different "types" of individuals, and (iii) individuals exhibit adaptation behavior (e.g., they migrate) due to natural disasters and thus change the composition of the sample. I show that neither of these possibilities poses serious concerns in my setting. Third, I show that the results are robust to the inclusion of leads and therefore that there are no pre-trends in my empirical setting. Fourth, I consider two alternative ways of measuring droughts (drought dummies and the 3-month drought index) and

[31] Since my weather data only goes back to 1960, and since my sample ends in 2015, I can only calculate the number of droughts individuals are exposed to for respondents 55 or younger. They make up 78% of the sample.

[32] The dummy indicating no drought exposure is the one excluded from the regression. The effect on the dummy indicating exposure to 16 droughts should be taken with a grain of salt as only 8 individuals are exposed to 16 droughts.

show that the results survive this adjustment. Fifth, I show that the result is robust to the use of Conley standard errors (Conley, 1999). Sixth, I show that the main results are robust to the inclusion of different fixed effects. Seventh, I show that the results are unchanged when removing all controls. Eighth, I find that the results are robust when only controlling for age, gender, and education. Ninth, I show that the results survive when controlling for temperature and precipitation levels. Tenth, I show that the results remain unchanged when controlling for village controls.

4 Exposure to Non-Democratic Systems

The previous section has established that extreme weather events reduce the support for democracy and that this effect only persists in democracies. I have so far not looked at what mechanisms or channels drive this reduced form finding. This section dives into this question.

The list of possible channels driving the baseline result is (almost) endless. While the literature cited in the introduction emphasizes a channel via income (economic circumstances), this is by far not the only plausible mechanism. For example, it is widely known (and I show it in Table A5) that weather variations affect conflict, which may very well in turn affect respondents support for democracy.[33] The aim of this section is therefore not to identify *the* channel driving

[33]The empirical literature cited in the introduction often assumes that weather shocks only affect political outcomes via income. For example, Brückner and Ciccone (2011) write "under the assumption that rainfall shocks affect democratic change only through income, we can estimate the effect of transitory income shocks on democratic institutions using an instrumental variables approach." While they focus on democratic change (something I cannot do as I have a repeated cross-section), this is a very strong assumption that I do not think is empirically supported given the plethora of outcomes that the weather affects (Carleton and Hsiang, 2016).

the results but to parse out *a* channel driving the result, amongst many others.[34,35]

This section inquires whether the exposure to non-democratic systems is a channel driving the results. I proxy this exposure by exposure to development projects funded by the World Bank and China, the former being technocratic and the latter being autocratic.

The motivation for focusing on this channel comes from a growing, albeit very inconclusive, literature evaluating the relationship between the presence of foreign aid and political attitudes. For example, Bai et al. (2022) show that Chinese infrastructure aid significantly increases positive attitudes towards the government in the region where the aid was implemented. While Eichenauer et al. (2021) and Blair et al. (2022) find no evidence that exposure to Chinese development projects in, respectively, Latin America and Africa increase attitudes towards China, Wellner et al. (2022) show that exposure to Chinese development projects can increase the support for China. Most closely related to this paper, Freytag et al. (2024) show that exposure to Chinese development aid in Latin America is associated with an increase in democratic values.[36]

The hypothesis I test in this section is that the interaction of a drought and the exposure to a development project is the driving force that explains the observed reduction in the support for democracy in section 3. To be precise, I posit that a "cultural transmission" occurs due to this exposure to non-democratic systems of government. In other words, the mechanism underlying

[34]To explore how possible channels mediate the main effect, Table A7 explores heterogeneous effects with respect to nine characteristics by expanding equation (1) and adding an interaction term of the drought index and a variable and said variable itself. The dimensions of heterogeneity are: (i) a variable indicating the number of years a country has been a democracy (to count the years as a democracy I count the number of years since 1990 that the polity measurement was larger than 0); (ii) a variable proxying the level of local state capacity (to create the local state capacity measure, I construct an index by adding all (except "urban") village characteristics from Table A2 together. The resulting index ranges from 0 to 8); (iii) lagged log nightlights; (iv) lagged exposure to a conflict event; (v) economic expectations; (vi) a dummy indicating whether the respondent is employed; (vii) a dummy indicating whether the respondent has completed high school education or more; (viii) a dummy indicating whether the respondent is male; and (ix) a dummy indicating whether the respondent lives in an urban area. The main result worth highlighting is that there are no significant differential effects across any of these nine dimensions. The fact that dimensions that proxy income do not exhibit heterogeneous effects hints at the fact that income is not a mechanism driving the main result in this context. (I rely on lagged nightlights as current nightlights are affected by the drought index themselves. The result is unchanged when relying on the non-lagged measure. The same holds for the lagged conflict measure.) One possible explanation for this is the fact that only 3.9% of respondents associate economic development with democracy (see Table 1).

[35]Social capital is also a possible mechanism. For example, Buggle and Durante (2021) show that climate variability increases trust and cooperation and that communes—medieval cities characterized by inclusive political organization—are more widespread in regions with higher climate variability. Since my main finding is that droughts reduce the support for democracy, this mechanism is less likely to be at play here. See also Gorodnichenko and Roland (2021).

[36]There is also a literature that investigates the role of Chinese development aid and democratic backsliding of countries (Bader, 2015; Li, 2017; Hess and Aidoo, 2019; Gamso, 2019).

this channel is not (for example) an economic one, i.e., it is not an economic benefit (or lack thereof) of a development project that is relevant in mediating the impact of a drought. I argue that the exposure to these non-democratic systems per se is relevant in explaining the variation in the support for democracy when interacted with the exposure to a drought.

From a policy perspective, relying on ODA as a potential channel is interesting for at least two reasons. First, on average, ODA makes up 28.2% of the central government expenses for the countries in my sample, with a minimum of 1.22% in South Africa and a maximum of 88.2% in Malawi.[37] These numbers highlight the potential influence of exposure to alternative systems of governance. Second, the fight against climate change requires huge sums of money to flow to developing countries, with, for example, the World Bank being the "largest financier of climate action in developing countries delivering over $38.6 billion in [the] fiscal year 2023."[38] If ODA indeed does act as a driver of the results, this describes a "catch 22" as combating droughts and associated climate change requires foreign funding but simultaneously this funding, interacted with droughts, erodes democracy, thus highlighting a large negative externality.

4.1 Views of the World Bank and China

Supposing that development aid from the World Bank and China acts as a channel in explaining my result presumes that respondents hold some views about these entities. Table A8 summarizes views respondents in the Afrobarometer hold on China and the World Bank.[39]

Panel A contains three pieces of information. First, around two-thirds of respondents think that Chinese aid is useful. Second, when asking individuals which country or international organization is the best model for their country, 27.9% name China, 34.7% list the US, and 5.5% state international organizations such as the World Bank or the United Nations. Third, when asked which country has the largest influence on their country, 31.4% name China while 24.0% list the US.

Panels B and C document further views respondents hold about China. Specifically, Panel B shows that 80.6% of respondents view China as having a lot of economic influence on their

[37] Source: World Bank Indicators in 2015. There is no data for Mozambique and Nigeria.

[38] Source: https://www.worldbank.org/en/topic/climatechange/overview#2 (Last accessed: May 9, 2024)

[39] All variables presented are only available as a cross-section. Panels A, B, and C rely on data from the sixth round of the Afrobarometer and Panel D relies on data from the second round of the Afrobarometer.

country and 73.4% view this as a positive influence. Panel C lists the most important factor explaining this positive image of China: over 50% of individuals name infrastructure projects and business investments as the primary reason.

Panel D presents answers to two questions about the United Nations and the World Bank from the Afrobarometer. On a scale from 0 to 10, individuals were asked whether these institutions are doing a good job. Respondents rate both institutions at roughly 6.7 out of 10.

Table A9 regresses the support for democracy on some of these views to examine how they correlate. Column 1 (3) shows that individuals who believe China (the US) to be the best model for their country exhibit a lower (higher) support for democracy. Column 2 shows that similar to China, individuals who believe that the World Bank is doing a good job are less likely to support democracy. There is no correlation between people's view of the UN and their support for democracy (Column 4). Given my focus on development projects funded by China and the World Bank, the correlations from Table A9 suggest that the mechanism proposed in this section may work in similar directions for both types of projects.[40]

While I don't know what the non-democratic regimes are that individuals see in China or the World Bank, I assume that these are autocratic and technocratic ones, respectively.

4.2 Data

World Bank projects. Geocoded data on development projects approved by the World Bank from 1995-2014 are taken from AidData's Research Lab at William & Mary (Version 1.4.2).[41] I calculate the distance between each project location and individual (i.e., enumeration area) from the Afrobarometer and define exposure dummies indicating if the individual lives within 50km or 100km of a development project.[42]

Chinese projects. The data for development projects funded by China only are taken from AidData's Global Chinese Development Finance Dataset (Version 1.1.1). This data, introduced

[40]Columns 5 and 6 of Table A9 are discussed later in this section.

[41]I keep only projects in the sample that have precision codes 1 or 2. Furthermore, I assume that once a development project has been implemented it will "stay forever". The idea behind this is that if, for example, a road was built from 2002 to 2005, the road will not disappear in 2005. An individual interviewed in the Afrobarometer in 2009, for example, would therefore still be coded as being exposed to this road in my sample.

[42]I view 50km as the main distance because it is a reasonable commuting distance in Africa (Knutsen et al., 2017). I also report all result for 100km as a robustness test.

by Strange et al. (2017) and geocoded by Dreher et al. (2016), has widely been used in research (e.g., Dreher and Fuchs, 2015; Dreher et al., 2018; Mueller, 2022).[43] I again calculate the distance between each project location and individual from the Afrobarometer and define exposure dummies indicating if the individual lives within 50km or 100km of a development project.

Summary statistics. I create three groups of dummies. First, group G_{never} is an indicator for individuals that are never exposed to a project. Second, group G_{active} is an indicator for individuals that are interviewed after a project started to be implemented (i.e., they are exposed to a project at the time of the interview). Third, group $G_{inactive}$ is an indicator for individuals that are interviewed before a project started to be implemented (i.e., they will be exposed in the future but are not exposed at the time of the interview).

Relying on the 50km (100km) radius for World Bank projects shows that 28.1%, 65.0%, and 6.92% (18.7%, 75.8%, and 5.5%) of individuals are in groups G_{never}, G_{active}, and $G_{inactive}$, respectively. Similarly, relying on the 50km (100km) radius for Chinese projects shows that 67.6%, 22.4%, and 10.0% (49.2%, 35.8%, and 15.0%) of individuals are in groups G_{never}, G_{active}, and $G_{inactive}$, respectively.

4.3 The Development Projects

Figure A4 displays the share of development projects by the World Bank (Panel A) and China (Panel B) by sector across time. While "government and civil society" rank high for both, the World Bank otherwise tends to focus more on "water supply and sanitation" projects while China stays in the "health" and "education" sectors.

Finally, Table A10 regresses dummy variables indicating whether the respondent lives within 50km or 100km of a future development project on the drought index, thus assessing whether these projects are targeted towards drought areas.[44] The table shows no correlation for Chinese projects and a small negative correlation for World Bank projects.

[43] I drop umbrella agreements (Dreher et al., 2021), only keep projects categorized as ODA (Isaksson and Kotsadam, 2018*a*), drop any co-financed projects, and only consider projects where the source of the project information comes from official sources.

[44] To be clear, the outcome is the $G_{inactive}$ dummy indicating future exposure to projects. It is important to take this variable as the relevant question is whether droughts (or disasters more broadly) affect the location choice of future projects. How the location choice of past projects correlates with current droughts is irrelevant.

For Chinese projects this implies that areas subject to disasters are not actively targeted.[45] For World Bank projects, the results suggest that drought occurrences do affect their (future) locations. More precisely, World Bank projects are less likely to be built in areas where droughts occurred in the past. As I posit that the presence of a World Bank project acts as a channel in explaining the effect of a drought on the support for democracy, this means that I will underestimate the effect of droughts on the support for democracy for individuals exposed to World Bank projects in the following subsection.

4.4 The Exposure to Alternatives to Democracy

Empirical strategy. The empirical strategy to test whether development aid from the World Bank or China acts as a mechanism is a straightforward extension of the statistical model in (1)

$$\begin{aligned}\text{Support for democracy}_{iegct} = \delta_{cy} + \tau_r + \beta_0 \text{Drought Index}_{gct} \\ + \beta_1(\text{Drought Index}_{gct} \times \text{G}^{x\text{km}}_{\text{active},iegct}) + \beta_2 \text{G}^{x\text{km}}_{\text{active},iegct} + \mathbf{x}_{iegct}\gamma + \epsilon_{iegct} \quad (2)\end{aligned}$$

where $\text{G}^{x\text{km}}_{\text{active},iegct}$ is a dummy variable indicating exposure to either a World Bank or a Chinese project and $x \in \{50\text{km}, 100\text{km}\}$. The remaining variables are defined as in equation (1).

A difference to equation (1) are the fixed effects. δ_{cy} are country by year fixed effects. These capture (i) the 16 countries' time-varying relations with China and the World Bank (e.g., diplomatic relations, trade, FDI) and (ii) changes in the political and economic landscape of the recipient country. τ_r are region fixed effects, controlling for time-invariant differences across regions. Jointly, these fixed effects control for factors that influence the allocation of aid by China and the World Bank.

In this specification, β_0 is the effect of the drought index on the support for democracy for individuals not exposed to a development project and β_1 represents the differential effect of the drought index on the support for democracy of exposed and not exposed individuals. $\beta_0 + \beta_1$ is thus the effect of the drought index on the support for democracy for individuals exposed to a development project funded by the World Bank or China.

[45] This is contrary to the finding in Cervellati et al. (2022) who show that the location of Chinese projects is shaped by geo-climatological conditions.

Results. Table A11 presents estimates of how exposure to Chinese projects affects views of democracy.[46,47] The table shows that exposure to both Chinese and World Bank projects negatively, but insignificantly, correlates with the democracy index, mirroring the findings in Gehring et al. (2022). The fact that these negative correlations are not significant does not imply that the exposure to non-democratic systems of governance does not act as a channel. In other words, this is not a "first stage" as the argument in this section is that the interaction of climate shocks and this exposure impact the support for democracy.

Table 7 displays the main results of section 4. Columns 1 and 2 (3 and 4) interact the drought index with exposure to Chinese (World Bank) projects within 50km and 100km, respectively. The top panel presents the estimated coefficients $\widehat{\beta}_0$ and $\widehat{\beta}_1$. The second panel then displays the sum of the estimates, $\widehat{\beta}_0 + \widehat{\beta}_1$, as well as the p-value associated with said coefficients. Finally, the third panel translates the effects of $\widehat{\beta}_0$ and $\widehat{\beta}_0 + \widehat{\beta}_1$ into percentage effects of one drought.

The drought index has no significant negative effect on the support for democracy for respondents not exposed to a development project. The differential effect of the index for exposed and not exposed individuals ranges from 1.6 to 2.5 percentage points. This difference is highly statistically significant. This then culminates in a significant effect of the drought index on the support for democracy of -1.3 to -2.4 percentage points for exposed individuals. In other words, respondents living in areas exposed to alternatives to democracy and exposed to one drought experience a reduction in the support for democracy of 3.03% to 5.59%.

4.5 Robustness

Development projects are unlikely to be randomly allocated throughout SSA, likely targeting areas with particular characteristics (like poorer areas). It is therefore possible that my results

[46]The outcome in this table is a democracy index, consisting of my main outcome (support for democracy) and the three variables summarized in Panel D of Table 1. I rely on all these outcomes since Gehring et al. (2022) show that they can all be affected by the exposure to development projects.

[47]To estimate causal effects of development projects on economic outcomes, the literature (e.g., Knutsen et al., 2017; Isaksson and Kotsadam, 2018*a*) here usually relies on a quasi-DiD design, which in my case translates to

$$\text{Democracy Index}_{iegct} = \delta_{cy} + \tau_r + \beta_1 \text{G}^{x\text{km}}_{\text{inactive},iegct} + \beta_2 \text{G}^{x\text{km}}_{\text{active},iegct} + \mathbf{x}_{iegct}\gamma + \epsilon_{iegct} \tag{3}$$

where $\text{G}^{x\text{km}}_{\text{inactive},iegt}$ is a dummy variable indicating future exposure to either a World Bank or a Chinese project and $x \in \{50\text{km}, 100\text{km}\}$. Here, $\beta_2 - \beta_1$ provides a quasi-DiD effect of exposure to a development project on the democracy index (relative to individuals who are never exposed to a project).

conflate other mechanisms. The aim here is to mitigate this concern.

Anticipation effects. To test for anticipation effects, I augment equation (3) to get

$$\begin{aligned}\text{Support for democracy}_{iegct} = \delta_{cy} + \tau_r + \beta_0 \text{Drought Index}_{gct} \\ + \beta_1(\text{Drought Index}_{gct} \times \text{G}^{x\text{km}}_{\text{inactive},iegct}) + \beta_2(\text{Drought Index}_{gct} \times \text{G}^{x\text{km}}_{\text{active},iegct}) \\ + \beta_3 \text{G}^{x\text{km}}_{\text{inactive},iegct} + \beta_4 \text{G}^{x\text{km}}_{\text{active},iegct} + \mathbf{x}_{iegct}\gamma + \epsilon_{iegct} \quad (4)\end{aligned}$$

β_1 in (4) indicates whether a drought has an effect on the support for democracy for individuals living in areas where a development project will be enacted in the future.

Table 8 presents the results. The interaction between the drought index and inactive development projects is insignificant. Areas that receive a project only after experiencing a drought do not exhibit any relationship between droughts and the support for democracy. If projects target certain types of areas, and certain characteristics of these areas drive the overall results, the drought index in these areas with these future development projects would display significant effects. Therefore, this test rules out local conditions as a potential mechanism.

Doughnuts. The premise of the doughnut idea is that if the exposure to alternatives to democracy (i.e., the presence of ODA) is orthogonal to some x, then this x cannot be a mechanism because the relationship between climate change and the support for democracy only exists for individuals exposed to alternatives to democracy. This relatively simple insight thus has the power to rule out a whole range of possible mechanisms.

To fix ideas, consider local employment, a proxy for income. Local development projects are not simply orthogonal to employment (e.g., Sautman and Yan, 2015; Guo et al., 2022). To show this, Table 9 regresses a dummy variable indicating whether the respondent is employed on a dummy variable indicating whether the respondent lives within a radius of, respectively, 10km, 20km (conditional on not living within 10km), and 30km (conditional on not living within 20km) of a development project funded by the World Bank or China. The idea behind this regression is simply that it is likely that development projects benefit respondents living close by a project and that at some point this economic benefit fades out. The table shows

that individuals living within 10km of a development project benefit economically from it, while individuals living further away do not benefit from the project. As such, for individuals living beyond 10km of a development project, there is no correlation between employment and the presence of development projects.

Employment, or income, is a potential mechanism that may be confounding my results from the previous subsection. Because there is no relationship between the presence of development projects and employment beyond 10km of the project, replicating the results from Table 7 while excluding individuals who live within a 10km radius of a development project serves as a test whether I am conflating income and exposure to non-democratic systems as mechanisms above.

Table 10 does exactly that, i.e., it replicates Table 7 but drops individuals living within 10km of a development project from the sample. The results are unchanged. This suggests that the finding that droughts only affect the support for democracy for individuals exposed to development projects is unlikely to be driven by confounding factors such as income.[48]

Employment is not the only possible confounder that threatens the result in Table 7. The doughnut design can therefore be repeated with any other confounder one can think of. While not shown in the paper, I find that the presence of these development projects either does not correlate with potential confounders or, if so, affects them only within a 10km radius.[49] In other words, the regression in Table 10 simultaneously takes into account multiple confounders.

Sectors of ODA. Table 11 asks whether the results in Table 7 are driven by development projects in particular sectors. As can be seen, when defining (a) "government and civil society" and "other social infrastructure" as "infrastructure projects", (b) "health" and "education" as "health and education projects", (c) "water supply and sanitation" as "water supply and sanitation projects", and (d) "energy generation and supply" as "energy" projects, no sector in particular seems to be driving the results displayed above.[50] This is further evidence that the development projects here do indeed act as proxies for exposure to non-democratic systems of

[48]Columns 5 and 6 of Table A9 show that individuals' views on China and the World Bank also negatively correlate with the support for democracy if individuals living within 10km of a Chinese or World Bank project, respectively, are excluded from the sample.

[49]As an example, the presence of development projects barely affects most village level characteristics from Table A2, for example.

[50]For expositional simplicity I group exposure to Chinese or World Bank projects together into one exposure variable for this table. The results are unchanged if done separately for Chinese and World Bank projects.

governance and are not targeting a particular need of people which may be driving the result.

Trust. Table 6 shows that the effects of droughts on the support for democracy as well as trust in government and institutions only exists in democracies. This leads to the plausible hypothesis that trust in government and institutions acts as mechanisms in explaining the reduction in the support for democracy. Table 12 provides evidence against this hypothesis. Specifically, the table shows that droughts reduce trust in government and institutions for individuals both exposed and not exposed to Chinese and World Bank development projects, which stands in contrast to the finding from Table 7 showing that the support for democracy is only reduced for individuals exposed to development projects.[51]

Other radii. Table A12 shows that the main result from Table 7 remains unchanged when changing the radius of exposure to 20km and 30km.[52]

5 Tangible Outcomes

This section tests whether the effects on the support for democracy translate into tangible effects, focusing on conflict events and demonstrations. Table 13 presents the results.

Columns 1 and 2 show that droughts reduce the probability of riots in a respondent's grid cell if the individual is exposed to a Chinese or World Bank project, respectively. There is no effect for individuals not exposed to development projects. This goes against the idea in Acemoglu and Robinson (2001) who argue that individuals may be more likely to protest to advance democracy ("threaten revolution") when the opportunity cost is low, which is likely the case during a drought/recession. It also goes against the finding in Iacoella et al. (2021), who show that the presence of Chinese development aid increases the occurrence of protests.

[51]This result is related to the "backlash argument." The rise of populism around the world has, in popular writings, led to a widespread acceptance that individuals are upset and lash out against the political elites by voting for populists. Is it possible that this also holds in my context? In other words, can it be that this decrease in the support for democracy and the mechanism via exposure to "other actors" is purely a backlash against incumbent political elites? In regressions replicating the main results in Table 7, but adding an additional interaction indicating whether a respondent lives in a high or low state capacity area, I show that droughts only affect the support for democracy for individuals exposed to development projects and this effect is significant and negative for individuals in high and low state capacity areas. In other words, the "backlash argument" does not apply.

[52]The results are unchanged for other radii as well.

Columns 3 and 4 show that droughts increase the probability that people would demonstrate, but only if they are not exposed to development projects.[53] Similarly, in Columns 5 and 6, I show that droughts increase real conflict events in respondent's grid cells only for individuals not exposed to development projects. This is in line with the findings in Gehring et al. (2022) who show that development projects reduce conflict occurrences/increase stability.[54]

Table 13 tells a compelling story. Columns 1 and 2 suggest that individuals become more "submissive" to a strong state: for individuals exposed to development projects, droughts reduce the support for democracy as well as the probability that riots occur. In line with this, the remaining columns show that for individuals exposed to development projects, droughts have no effect on respondent's desire to demonstrate or the probability that they engage conflicts.

Put differently, there is positive relationship between the support for democracy and conflict (in the sense that when one decreases the other does as well). Columns 3—6 show that droughts do increase conflict for individuals not exposed to development projects. This is reassuring as there is a large literature documenting increases in conflict due to variations in the weather. However, this effect disappears for individuals exposed to development projects, possibly due to the decrease in the support for democracy.

6 Conclusion

To my knowledge, this paper is the first to analyze the relationship between individuals' support for democracy and climate change in detail. The main takeaway is that exposure to non-democratic systems of governance is a key channel when considering this relationship.

The paper opens the doors to many more research questions. Taken together, these avenues for future work lay out an exciting and policy relevant research agenda.

First, there is a need for more granular data on individuals' preferences on and beliefs about climate change and how they relate to a variety of political outcomes in developing countries. Specifically, the process of how individuals update their beliefs about climate change and politics is largely untouched in this paper.[55] Related to this is a need specific to this paper: given the

[53] This is not a tangible outcome but a belief from the Afrobarometer.

[54] Sardoschau and Jarotschkin (2024) show that Chinese development projects increase conflict incidents.

[55] There is some work on how individuals update beliefs about climate change in developed countries (e.g.,

decrease in the support for democracy, it is pertinent to understand what alternative systems of governance individuals have in mind.

Second, there is ample room for more theoretical contributions in political economy showing how individuals choose what political system they want to have in their country. In this paper, I look at how extreme weather events in 16 SSA countries affect these beliefs, but more generally these could be a variety of conditions that individuals are exposed to. To date we lack theoretical models to help us understand how these beliefs are formed in detail. Detailed data collection processes on beliefs about climate change and political systems (point 1) can complement this theoretical undertaking.

Third, while I have analyzed the relationship between the support for democracy and conflict, the support for democracy may affect a range of other tangible outcomes as well. For example, voter turnout, voting outcomes, or, more extreme, participation in revolutions, are all actions by individuals that could be affected.

Finally, this paper has solely focused on developing countries. Climate change and the erosion of democratic norms are big policy issues in developed countries as well—it is therefore important to study this relationship in these countries as well.

7 Bibliography

Acemoglu, D., Ajzenman, N., Aksoy, C. G., Fiszbein, M. and Molina, C. A., 2021. (Successful) democracies breed their own support, Technical report, National Bureau of Economic Research.

Acemoglu, D., Johnson, S. and Robinson, J. A., 2002. 'Reversal of fortune: Geography and institutions in the making of the modern world income distribution', *The Quarterly Journal of economics* **117**(4), 1231–1294.

Acemoglu, D., Johnson, S., Robinson, J. A. and Yared, P., 2008. 'Income and democracy', *American Economic Review* **98**(3), 808–842.

Acemoglu, D. and Robinson, J. A., 2001. 'A theory of political transitions', *American Economic Review* **91**(4), 938–963.

Alfano, M. and Aboyadana, G. A., 2020. 'Perceived temperature, trust and civil unrest in Africa'.

Deryugina, 2013), but much more work is needed in developing countries. There is work on attitudes about climate change (e.g., Dechezleprêtre et al., 2022).

Almond, G. A. and Verba, S., 1963. 'The civic culture: Political attitudes and democracy in five nations'.

Amirapu, A., Clots-Figueras, I. and Rud, J. P., 2022. 'Climate change and political participation: Evidence from India'.

Auffhammer, M., Hsiang, S. M., Schlenker, W. and Sobel, A., 2013. 'Using weather data and climate model output in economic analyses of climate change', *Review of Environmental Economics and Policy* .

Bader, J., 2015. 'China, autocratic patron? an empirical investigation of China as a factor in autocratic survival', *International Studies Quarterly* **59**(1), 23–33.

Bai, Y., Li, Y. and Wang, Y., 2022. 'Chinese aid and local political attitudes', *Economic Modelling* **113**, 105893.

Balcazar, C. F. and Kennard, A., 2022. 'Climate change and political (in) stability', *Available at SSRN 4206967* .

Barro, R. J., 1999. 'Determinants of democracy', *Journal of Political Economy* **107**(S6), S158–S183.

Barron, M., Miguel, E. and Satyanath, S., 2014. 'Economic shocks and democratization in africa', *Political Science Research and Methods* **2**(1), 33–47.

BenYishay, A., Rotberg, R., Wells, J., Lv, Z., Goodman, S., Kovacevic, L. and Runfola, D., 2017. 'Geocoding Afrobarometer rounds 1-6: Methodology & data quality', *AidData. Available online at http://geo. aiddata. org* .

Besley, T. and Burgess, R., 2002. 'The political economy of government responsiveness: Theory and evidence from India', *The Quarterly Journal of Economics* **117**(4), 1415–1451.

Besley, T. and Persson, T., 2019. 'Democratic values and institutions', *American Economic Review: Insights* **1**(1), 59–76.

Blair, R. A., Marty, R. and Roessler, P., 2022. 'Foreign aid and soft power: Great power competition in Africa in the early twenty-first century', *British Journal of Political Science* **52**(3), 1355–1376.

Bluhm, R., Dreher, A., Fuchs, A., Parks, B., Strange, A. and Tierney, M. J., 2018. 'Connective financing: Chinese infrastructure projects and the diffusion of economic activity in developing countries'.

Borusyak, K., Jaravel, X. and Spiess, J., 2021. 'Revisiting event study designs: Robust and efficient estimation', *arXiv preprint arXiv:2108.12419* .

Brückner, M. and Ciccone, A., 2011. 'Rain and the democratic window of opportunity', *Econometrica* **79**(3), 923–947.

Buggle, J. C. and Durante, R., 2021. 'Climate risk, cooperation and the co-evolution of culture and institutions', *The Economic Journal* **131**(637), 1947–1987.

Burke, P. J. and Leigh, A., 2010. 'Do output contractions trigger democratic change?', *American Economic Journal: Macroeconomics* **2**(4), 124–157.

Burzyński, M., Deuster, C., Docquier, F. and De Melo, J., 2022. 'Climate change, inequality, and human migration', *Journal of the European Economic Association* **20**(3), 1145–1197.

Callaway, B. and Sant'Anna, P. H., 2021. 'Difference-in-differences with multiple time periods', *Journal of Econometrics* **225**(2), 200–230.

Carleton, T. A. and Hsiang, S. M., 2016. 'Social and economic impacts of climate', *Science* **353**(6304), aad9837.

Castells-Quintana, D., del Pilar Lopez-Uribe, M. and McDermott, T. K., 2022. 'Population displacement and urban conflict: Global evidence from more than 3300 flood events', *Journal of Development Economics* **158**, 102922.

Cervellati, M., Esposito, E., Sunde, U. and Yuan, S., 2022. 'Malaria and Chinese economic activities in Africa', *Journal of Development Economics* **154**, 102739.

Claassen, C., 2020*a*. 'Does public support help democracy survive?', *American Journal of Political Science* **64**(1), 118–134.

Claassen, C., 2020*b*. 'In the mood for democracy? Democratic support as thermostatic opinion', *American Political Science Review* **114**(1), 36–53.

Cole, S., Healy, A. and Werker, E., 2012. 'Do voters demand responsive governments? Evidence from Indian disaster relief', *Journal of Development Economics* **97**(2), 167–181.

Conley, T. G., 1999. 'GMM estimation with cross sectional dependence', *Journal of Econometrics* **92**(1), 1–45.

Conte, B., 2022. 'Climate change and migration: the case of Africa'.

De Chaisemartin, C. and d'Haultfoeuille, X., 2022*a*. Difference-in-differences estimators of intertemporal treatment effects, Technical report, National Bureau of Economic Research.

De Chaisemartin, C. and d'Haultfoeuille, X., 2022*b*. Two-way fixed effects and differences-in-differences with heterogeneous treatment effects: A survey, Technical report, National Bureau of Economic Research.

de Chaisemartin, C., d'Haultfoeuille, X., Pasquier, F. and Vazquez-Bare, G., 2022. 'Difference-in-differences estimators for treatments continuously distributed at every period', *arXiv preprint arXiv:2201.06898* .

De Chaisemartin, C. and d'Haultfoeuille, X., 2020. 'Two-way fixed effects estimators with heterogeneous treatment effects', *American Economic Review* **110**(9), 2964–2996.

Dechezleprêtre, A., Fabre, A., Kruse, T., Planterose, B., Chico, A. S. and Stantcheva, S., 2022. Fighting climate change: International attitudes toward climate policies, Technical report, National Bureau of Economic Research.

Dell, M., Jones, B. F. and Olken, B. A., 2014. 'What do we learn from the weather? The new climate-economy literature', *Journal of Economic literature* **52**(3), 740–798.

Deryugina, T., 2013. 'How do people update? The effects of local weather fluctuations on beliefs about global warming', *Climatic Change* **118**, 397–416.

Dreher, A. and Fuchs, A., 2015. 'Rogue aid? An empirical analysis of China's aid allocation', *Canadian Journal of Economics/Revue Canadienne d'Économique* **48**(3), 988–1023.

Dreher, A., Fuchs, A., Hodler, R., Parks, B. C., Raschky, P. A. and Tierney, M. J., 2019. 'African leaders and the geography of China's foreign assistance', *Journal of Development Economics* **140**, 44–71.

Dreher, A., Fuchs, A., Hodler, R., Parks, B., Raschky, P. and Tierney, M. J., 2016. 'Aid on demand: African leaders and the geography of China's foreign assistance', *Centro Studi Luca d'Agliano Development Studies Working Paper* (400).

Dreher, A., Fuchs, A., Parks, B., Strange, A. M. and Tierney, M. J., 2018. 'Apples and dragon fruits: The determinants of aid and other forms of state financing from China to Africa', *International Studies Quarterly* **62**(1), 182–194.

Dreher, A., Fuchs, A., Parks, B., Strange, A. and Tierney, M. J., 2021. 'Aid, China, and growth: Evidence from a new global development finance dataset', *American Economic Journal: Economic Policy* **13**(2), 135–174.

Easton, D., 1965. 'A systems analysis of political life'.

Eichenauer, V. Z., Fuchs, A. and Brückner, L., 2021. 'The effects of trade, aid, and investment on China's image in Latin America', *Journal of Comparative Economics* **49**(2), 483–498.

Fitch-Fleischmann, B. and Kresch, E. P., 2021. 'Story of the hurricane: Government, NGOs, and the difference in disaster relief targeting', *Journal of Development Economics* **152**, 102702.

Freytag, A., Kautz, M. and Wolf, M., 2024. 'Chinese aid and democratic values in Latin America', *Public Choice* pp. 1–63.

Fuchs-Schündeln, N. and Schündeln, M., 2015. 'On the endogeneity of political preferences: Evidence from individual experience with democracy', *Science* **347**(6226), 1145–1148.

Gamso, J., 2019. 'China's rise and physical integrity rights in developing countries', *Review of International Political Economy* **26**(4), 722–748.

Gehring, K., Kaplan, L. C. and Wong, M. H., 2022. 'China and the World Bank—how contrasting development approaches affect the stability of African states', *Journal of Development Economics* **158**, 102902.

Giuliano, P. and Nunn, N., 2021. 'Understanding cultural persistence and change', *The Review of Economic Studies* **88**(4), 1541–1581.

Gorodnichenko, Y. and Roland, G., 2021. 'Culture, institutions and democratization', *Public Choice* **187**, 165–195.

Guo, S., An, J. and Jiang, H., 2022. 'Chinese aid and local employment in Africa', *Available at SSRN 3718578* .

Guriev, S. and Papaioannou, E., 2022. 'The political economy of populism', *Journal of Economic Literature* **60**(3), 753–832.

Haggard, S. and Kaufman, R. R., 1995. *The political economy of democratic transitions*, Princeton University Press.

Hanusch, M., 2012. 'African perspectives on China–Africa: Modelling popular perceptions and their economic and political determinants', *Oxford Development Studies* **40**(4), 492–516.

Harari, M. and La Ferrara, E., 2018. 'Conflict, climate, and cells: A disaggregated analysis', *Review of Economics and Statistics* **100**(4), 594–608.

Healy, A. and Malhotra, N., 2009. 'Myopic voters and natural disaster policy', *American Political Science Review* **103**(3), 387–406.

Healy, A., Malhotra, N. et al., 2010. 'Random events, economic losses, and retrospective voting: Implications for democratic competence', *Quarterly Journal of Political Science* **5**(2), 193–208.

Hernandez, D., 2017. 'Are "new" donors challenging World Bank conditionality?', *World Development* **96**, 529–549.

Hess, S. and Aidoo, R., 2019. 'Democratic backsliding in sub-Saharan Africa and the role of China's development assistance', *Commonwealth & Comparative Politics* **57**(4), 421–444.

Huber, E., Rueschemeyer, D. and Stephens, J. D., 1993. 'The impact of economic development on democracy', *Journal of Economic Perspectives* **7**(3), 71–86.

Humphrey, C. and Michaelowa, K., 2019. 'China in Africa: Competition for traditional development finance institutions?', *World Development* **120**, 15–28.

Iacoella, F., Martorano, B., Metzger, L. and Sanfilippo, M., 2021. 'Chinese official finance and political participation in Africa', *European Economic Review* **136**, 103741.

IDA, 2021. 'IDA20 Special theme: climate change by the international development association'.

IPCC, 2021. 'Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the intergovernmental panel on climate change'.

Isaksson, A.-S. and Kotsadam, A., 2018*a*. 'Chinese aid and local corruption', *Journal of Public Economics* **159**, 146–159.

Isaksson, A.-S. and Kotsadam, A., 2018*b*. 'Racing to the bottom? Chinese development projects and trade union involvement in Africa', *World Development* **106**, 284–298.

Kern, A., Reinsberg, B. and Shea, P. E., 2024. 'Why cronies don't cry? IMF programs, Chinese lending, and leader survival', *Public Choice* **198**(3), 269–295.

Kleinberg, K. B. and Fordham, B. O., 2010. 'Trade and foreign policy attitudes', *Journal of Conflict Resolution* **54**(5), 687–714.

Klomp, J., 2020. 'Do natural disasters affect monetary policy? A quasi-experiment of earthquakes', *Journal of Macroeconomics* **64**, 103164.

Knutsen, C. H., Kotsadam, A., Olsen, E. H. and Wig, T., 2017. 'Mining and local corruption in Africa', *American Journal of Political Science* **61**(2), 320–334.

Kosec, K. and Mo, C. H., 2017. 'Aspirations and the role of social protection: Evidence from a natural disaster in rural Pakistan', *World Development* **97**, 49–66.

Li, X., 2017. 'Does conditionality still work? China's development assistance and democracy in Africa', *Chinese Political Science Review* **2**(2), 201–220.

Lipset, S. M., 1959. 'Some social requisites of democracy: Economic development and political legitimacy', *American Political Science Review* **53**(1), 69–105.

Malhotra, N. and Kuo, A. G., 2008. 'Attributing blame: The public's response to Hurricane Katrina', *The Journal of Politics* **70**(1), 120–135.

Martorano, B., Metzger, L. and Sanfilippo, M., 2020. 'Chinese development assistance and household welfare in sub-Saharan Africa', *World Development* **129**, 104909.

McKee, T. B., Doesken, N. J., Kleist, J. et al., 1993. The relationship of drought frequency and duration to time scales, *in* 'Proceedings of the 8th Conference on Applied Climatology', Vol. 17, California, pp. 179–183.

Meyersson, E., i Miquel, G. P. and Qian, N., 2008. 'The rise of China and the natural resource curse in Africa', *London School of Economics and Political Science, Economic Organisation and Public Policy Programme* .

Mishra, A. K. and Singh, V. P., 2010. 'A review of drought concepts', *Journal of Hydrology* **391**(1-2), 202–216.

Mueller, J., 2022. China's foreign aid: Political determinants and economic effects, Technical report, Working paper, www. jorismueller. com/files/chinaaid_latest_draft. pdf.

Neugart, M. and Rode, J., 2021. 'Voting after a major flood: Is there a link between democratic experience and retrospective voting?', *European Economic Review* **133**, 103665.

Palmer, W. C., 1965. *Meteorological drought*, Vol. 30, US Department of Commerce, Weather Bureau.

Pathak, P. and Schündeln, M., 2022. 'Social hierarchies and the allocation of development aid: Evidence from the 2015 earthquake in Nepal', *Journal of Public Economics* **209**, 104607.

Peng, J., Dadson, S., Hirpa, F., Dyer, E., Lees, T., Miralles, D. G., Vicente-Serrano, S. M. and Funk, C., 2020. 'A pan-African high-resolution drought index dataset', *Earth System Science Data* **12**(1), 753–769.

Persson, T. and Tabellini, G., 2009. 'Democratic capital: The nexus of political and economic change', *American Economic Journal: Macroeconomics* **1**(2), 88–126.

Przeworski, A. and Limongi, F., 1997. 'Modernization: Theories and facts', *World Politics* **49**(2), 155–183.

Rodrik, D., Subramanian, A. and Trebbi, F., 2004. 'Institutions rule: the primacy of institutions over geography and integration in economic development', *Journal of Economic Growth* **9**, 131–165.

Roth, J., Sant'Anna, P. H., Bilinski, A. and Poe, J., 2023. 'What's trending in difference-in-differences? A synthesis of the recent econometrics literature', *Journal of Econometrics* .

Sardoschau, S. and Jarotschkin, A., 2024. 'Chinese aid in Africa: Attitudes and conflict', *European Journal of Political Economy* p. 102500.

Sautman, B. and Yan, H., 2015. Localizing Chinese enterprises in Africa: From myths to policies, Technical report, HKUST Institute for Emerging Market Studies.

Stantcheva, S., 2023. 'How to run surveys: A guide to creating your own identifying variation and revealing the invisible', *Annual Review of Economics* **15**, 205–234.

Strange, A. M., Dreher, A., Fuchs, A., Parks, B. and Tierney, M. J., 2017. 'Tracking under-reported financial flows: China's development finance and the aid–conflict nexus revisited', *Journal of Conflict Resolution* **61**(5), 935–963.

Sun, L. and Abraham, S., 2021. 'Estimating dynamic treatment effects in event studies with heterogeneous treatment effects', *Journal of Econometrics* **225**(2), 175–199.

Tabellini, M. and Magistretti, G., 2022. Economic integration and the transmission of democracy, Technical report, National Bureau of Economic Research.

Tarquinio, L., 2022. 'The politics of drought relief: Evidence from southern India', *Available at SSRN 4163045* .

Treisman, D., 2020. 'Economic development and democracy: Predispositions and triggers', *Annual Review of Political Science* **23**(1), 241–257.

Vicente-Serrano, S. M., Beguería, S. and López-Moreno, J. I., 2010. 'A multiscalar drought index sensitive to global warming: The standardized precipitation evapotranspiration index', *Journal of Climate* **23**(7), 1696–1718.

Vicente-Serrano, S. M., Beguería, S., Lorenzo-Lacruz, J., Camarero, J. J., López-Moreno, J. I., Azorin-Molina, C., Revuelto, J., Morán-Tejeda, E. and Sanchez-Lorenzo, A., 2012. 'Performance of drought indices for ecological, agricultural, and hydrological applications', *Earth Interactions* **16**(10), 1–27.

Watkins, M., 2022. 'Undermining conditionality? the effect of Chinese development assistance on compliance with World Bank project agreements', *The Review of International Organizations* **17**(4), 667–690.

Wellner, L., Dreher, A., Fuchs, A., Parks, B. and Strange, A., 2022. 'Can aid buy foreign public support? Evidence from Chinese development finance'.

Wooldridge, J. M., 2021. 'Two-way fixed effects, the two-way Mundlak regression, and difference-in-differences estimators', *Available at SSRN 3906345* .

Zeitz, A. O., 2021. 'Emulate or differentiate? Chinese development finance, competition, and World Bank infrastructure funding', *The Review of International Organizations* **16**(2), 265–292.

8 Tables and Figures

Table 1: Summary Statistics of Political Variables (1)

	(1) Full Sample	(2) Eastern Africa	(3) Western Africa	(4) Southern Africa
A. Support for Democracy				
Respondent supports democracy (cond.)	0.859	0.872	0.872	0.818
	(0.348)	(0.334)	(0.334)	(0.386)
Respondent supports democracy (uncond.)	0.682	0.678	0.725	0.636
	(0.466)	(0.467)	(0.446)	(0.481)
Respondent indifferent to politics	0.206	0.222	0.168	0.223
	(0.404)	(0.416)	(0.374)	(0.416)
B. Meaning of Democracy				
Personal freedom	0.435	0.456	0.436	0.401
	(0.496)	(0.498)	(0.496)	(0.490)
Government for/by the people	0.099	0.072	0.135	0.094
	(0.299)	(0.258)	(0.342)	(0.292)
Voting	0.102	0.133	0.074	0.093
	(0.303)	(0.339)	(0.261)	(0.290)
Economic development	0.039	0.038	0.033	0.048
	(0.194)	(0.190)	(0.179)	(0.215)
C. Personal Freedom				
Freedom of speech	0.769	0.753	0.779	0.786
	(0.421)	(0.432)	(0.415)	(0.410)
Freedom to join organization	0.818	0.789	0.837	0.845
	(0.386)	(0.408)	(0.370)	(0.362)
Freedom to vote	0.843	0.831	0.849	0.857
	(0.363)	(0.375)	(0.358)	(0.350)
D. Erosion of Democracy				
Respondent doesn't support one party rule	0.741	0.701	0.833	0.699
	(0.438)	(0.458)	(0.373)	(0.459)
Respondent doesn't support army rule	0.798	0.837	0.769	0.765
	(0.402)	(0.370)	(0.422)	(0.424)
Respondent doesn't support one man rule	0.833	0.851	0.839	0.795
	(0.373)	(0.356)	(0.368)	(0.404)
Observations	128988	61208	37870	29910

Notes: The table displays mean sample characteristics and standard deviations (in parentheses) for a variety of political preferences. Panel A displays the share of individuals who indicate they support democracy vs. any other system of government (conditional on them not having answered that they are indifferent between democracy and other systems or on them having answered "don't know", and unconditionally) as well as the share of individuals who are indifferent to or don't know anything about politics. Panel B displays four meanings respondents associate with democracy: personal freedom, government by and for the people, voting, and economic development. Panel C displays summary statistics for three dimensions of personal freedom. Finally, Panel D displays summary statistics for three political variables relating to the erosion of democracy. Column 1 displays the characteristics across the full sample, while Columns 2—4 split the sample by regions in Africa. All summary statistics are calculated across all survey rounds.

Table 2: Summary Statistics of Political Variables (2)

	(1) Full Sample	(2) Eastern Africa	(3) Western Africa	(4) Southern Africa
A. Trust in Government				
Respondent trusts president	0.622	0.646	0.562	0.652
	(0.485)	(0.478)	(0.496)	(0.476)
Respondent trusts parliament	0.556	0.593	0.487	0.576
	(0.497)	(0.491)	(0.500)	(0.494)
Respondent trusts local government	0.513	0.545	0.472	0.506
	(0.500)	(0.498)	(0.499)	(0.500)
B. Capabilities of Government				
Gov. cap. of managing economy	0.485	0.480	0.420	0.574
	(0.500)	(0.500)	(0.494)	(0.494)
Gov. cap. of managing health	0.615	0.611	0.565	0.682
	(0.487)	(0.487)	(0.496)	(0.466)
Gov. cap. of managing education	0.652	0.667	0.560	0.736
	(0.476)	(0.471)	(0.496)	(0.441)
Gov. cap. of fighting corruption	0.433	0.423	0.409	0.478
	(0.495)	(0.494)	(0.492)	(0.500)
C. Trust in Institutions				
Respondent trusts police	0.539	0.530	0.510	0.588
	(0.498)	(0.499)	(0.500)	(0.492)
Respondent trusts courts	0.622	0.642	0.552	0.671
	(0.485)	(0.479)	(0.497)	(0.470)
Respondent trusts army	0.672	0.694	0.658	0.649
	(0.470)	(0.461)	(0.474)	(0.477)
D. Is your Country a Democracy?				
Not a democracy	0.077	0.097	0.072	0.052
	(0.267)	(0.296)	(0.258)	(0.221)
Democracy with major problems	0.312	0.316	0.334	0.279
	(0.463)	(0.465)	(0.472)	(0.448)
Democracy with minro problems	0.378	0.386	0.365	0.382
	(0.485)	(0.487)	(0.481)	(0.486)
Full democracy	0.232	0.201	0.229	0.288
	(0.422)	(0.401)	(0.420)	(0.453)
Observations	128705	61074	37750	29881

Notes: The table displays mean sample characteristics and standard deviations (in parentheses) for a variety of political preferences. Panel A displays the share of respondents who trust (a) the president, (b) parliament, and (c) local government. Panel B reports summary statistics for four variables indicating whether the respondent believes that the government is capable of (a) managing the economy, (b) managing health services, (c) managing education services, or (d) fighting corruption. Panel C displays the shares of individuals who trust (a) the police, (b) the courts, or (c) the army. Finally, Panel D presents the share of individuals who view their country as (a) not a democracy, (b) a democracy with major problems, (c) a democracy with minor problems, and (c) a full democracy. Column 1 displays the characteristics across the full sample, while Columns 2—4 split the sample by regions in Africa. All summary statistics are calculated across all survey rounds from the Afrobarometer surveys.

Table 3: Extreme Weather Events and the Support for Democracy

	Respondent supports democracy			
	Coding 1		Coding 2	
	(1)	(2)	(3)	(4)
Drought index	-0.011**	-0.011**	-0.018***	-0.017***
	(0.005)	(0.005)	(0.005)	(0.005)
Lagged drought index (1 year)		-0.001		-0.010**
		(0.004)		(0.005)
Lagged drought index (2 years)		-0.000		-0.008
		(0.004)		(0.005)
p-value of joint significance		[0.108]		[0.000]
Mean of outcome	0.859		0.682	
Effect of one drought (2 SDs)	-2.56%	-2.56%	-5.28%	-4.99%
Lagged effect of one drought (2 SDs)		-0.23%		-2.93%
Lagged effect of one drought (2 SDs)		-0.00%		-2.35%
Household controls	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63077	63077	76792	76792

Notes: The table displays OLS regressions of two codings of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table 4: Dimensions of Democracy

	Respondent doesn't support			Freedom		
	one party rule	army rule	one man rule	of speech	to join organization	to vote
	(1)	(2)	(3)	(4)	(5)	(6)
Drought index	-0.023***	0.002	-0.012**	-0.019***	-0.013***	-0.012**
	(0.006)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)
Mean of outcome	0.741	0.798	0.833	0.769	0.818	0.843
Effect of one drought (2 SDs)	-6.21%	0.50%	-2.88%	-4.94%	-3.18%	-2.85%
Household controls	Yes	Yes	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	75489	74944	74479	75780	75475	75752

Notes: The table displays OLS regressions of dummy variables indicating (i) no support for one party rule, (ii) no support for army rule, (iii) no support for one man rule (i.e., abolishing parliament and elections), (iv) freedom of speech, (v) freedom to join political organizations, and (vi) freedom to vote of respondents on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table 5: Further Dimensions of Democracy

	Respondent trusts						Government is capable of managing/fighting			
	the president	the parliament	the local government	the police	the courts	the army	the economy	health services	education services	corruption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Drought index	-0.035***	-0.027***	-0.012**	-0.034***	-0.024***	-0.018***	-0.019***	-0.003	-0.018***	-0.006
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.008)	(0.006)	(0.005)	(0.008)
Mean of outcome	0.622	0.556	0.513	0.539	0.622	0.672	0.485	0.615	0.652	0.433
Effect of one drought (2 SDs)	-11.3%	-9.71%	-4.68%	-12.6%	-7.72%	-5.36%	-7.84%	-0.98%	-5.52%	-2.77%
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	74900	73869	71406	75639	73996	61706	73449	75392	75209	71830

Notes: The table displays OLS regressions of dummy variables indicating (i) trust in the president, (ii) trust in parliament, (iii) trust in the local government, (iv) trust in the police, (v) trust in the courts, (vi) trust in the local army, as well as the respondent's belief whether the government is capable (vii) of managing the economy, (viii) of managing health services, (ix) of managing education services, and (x) of fighting corruption on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table 6: Democracies vs. Autocracies

	Respondent supports democracy	Democracy index	Trust in government	Trust in institutions
	(1)	(2)	(3)	(4)
Drought index	-0.012**	-0.040**	-0.067***	-0.071***
	(0.005)	(0.016)	(0.013)	(0.012)
Drought index x country is autocratic	0.009	0.061*	0.113**	0.042
	(0.013)	(0.037)	(0.045)	(0.036)
Coefficient of index + interaction	-0.003	0.021	0.046	-0.029
p-value: Coefficient of index + interaction	[0.787]	[0.532]	[0.274]	[0.383]
Mean of outcome		0.859		
Effect of one drought (2 SDs) (no interaction)	-2.79%	-9.31%	-15.60%	-16.53%
Effect of one drought (2 SDs) (interaction)	-0.70%	4.89%	10.7%	-6.75%
Household controls	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63077	76160	76143	76062

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) (in Column 1), the democracy index (in Column 2), trust in government (in Column 3), and trust in institutions (in Column 4) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household characteristics, all of which are described in Table A1 in detail. All columns add an interaction of the SPEI index with a variable indicating whether the respondent lives in an autocratic country and that variable itself. The outcomes in Columns 2—4 are described in Tables 1 and 2 and the main text. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table 7: The Exposure to Alternatives to Democracy

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.002	-0.001	0.003	0.010
	(0.005)	(0.005)	(0.006)	(0.007)
Drought index x Chinese project (50km)	-0.022***			
	(0.007)			
Drought index x Chinese project (100km)		-0.021***		
		(0.007)		
Drought index x World Bank project (50km)			-0.016**	
			(0.007)	
Drought index x World Bank project (100km)				-0.025***
				(0.007)
Coefficient of exposure to project	-0.024	-0.022	-0.013	-0.015
p-value: Coefficient of exposure to project	[0.002]	[0.001]	[0.010]	[0.004]
Mean of outcome		0.859		
Effect of one drought (2 SDs) (no project exposure)	-0.47%	-0.23%	0.070%	2.33%
Effect of one drought (2 SDs) (project exposure)	-5.59%	-5.12%	-3.03%	-3.49%
Household controls	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63216	63216	63216	63216

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), an interaction of the SPEI index with a dummy variable indicating whether the respondent lives within a radius of 50km or 100km of a Chinese or World Bank project, said dummy itself, as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 8: Local Conditions do not act as Confounding Mechanisms

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.001	0.001	0.006	0.011
	(0.004)	(0.005)	(0.006)	(0.007)
Drought index x inactive Chinese project (50km)	-0.010			
	(0.012)			
Drought index x active Chinese project (50km)	-0.023***			
	(0.008)			
Drought index x inactive Chinese project (100km)		-0.009		
		(0.011)		
Drought index x active Chinese project (100km)		-0.023***		
		(0.007)		
Drought index x inactive World Bank project (50km)			-0.024**	
			(0.010)	
Drought index x active World Bank project (50km)			-0.021***	
			(0.007)	
Drought index x inactive World Bank project (100km)				-0.013
				(0.010)
Drought index x active World Bank project (100km)				-0.026***
				(0.008)
Mean of outcome	0.859			
Household controls	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63216	63216	63216	63216

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), an interaction of the SPEI index with a dummy variable indicating whether in a radius of, respectively, 50km or 100km from where the respondent resides a Chinese or World Bank project will exist in the future ("inactive project") or already exists ("active project"), said dummy itself, as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 9: Local Employment Correlates with Development Projects

	Respondent is employed					
	(1)	(2)	(3)	(4)	(5)	(6)
Chinese project: 10km	0.026**					
	(0.012)					
Chinese project: 20km | not 10km		0.008				
		(0.014)				
Chinese project: 30km | not 20km			-0.001			
			(0.014)			
World Bank project: 10km				0.029***		
				(0.006)		
World Bank project: 20km | not 10km					-0.001	
					(0.008)	
World Bank project: 30km | not 20km						-0.002
						(0.010)
Mean of outcome	0.345					
Household controls	No	No	No	No	No	No
Country by year effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	128446	117480	112171	128446	86549	69452

Notes: The table displays OLS regressions of a dummy variable indicating whether the respondent is employed on a dummy variable indicating whether the respondent lives within a radius of, respectively, 10km, 20km, or 30km of a Chinese or World Bank project. Columns 2 and 5 (3 and 6) are conditional on not living within a radius of 10km (20km) of a project. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 10: Excluding Income as a Mechanism

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.002	-0.000	0.002	0.010
	(0.005)	(0.005)	(0.006)	(0.007)
Drought index x Chinese project (50km)	-0.027***			
	(0.009)			
Drought index x Chinese project (100km)		-0.023***		
		(0.008)		
Drought index x World Bank project (50km)			-0.019**	
			(0.008)	
Drought index x World Bank project (100km)				-0.029***
				(0.008)
Coefficient of exposure to project	-0.029	-0.023	-0.017	-0.019
p-value: Coefficient of exposure to project	[0.002]	[0.001]	[0.013]	[0.002]
Mean of outcome		0.859		
Effect of one drought (2 SDs) (no project exposure)	-0.47%	-0.00%	0.47%	2.33%
Effect of one drought (2 SDs) (project exposure)	-6.75%	-5.36%	-3.96%	-4.42%
Household controls	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	58230	58230	44004	44004

Notes: The table replicates Table 7, but drops individuals living within 10km of a Chinese or World Bank project.

Table 11: Exposure to Different Sectors of Development Projects

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	0.000	0.000	0.004	-0.002
	(0.006)	(0.005)	(0.006)	(0.005)
Drought index x gov./infrastructure project	-0.014**			
	(0.007)			
Drought index x health/education project		-0.020***		
		(0.007)		
Drought index x sanitation/water project			-0.021***	
			(0.006)	
Drought index x energy project				-0.018**
				(0.008)
Coefficient of exposure to project	-0.013	-0.019	-0.017	-0.020
p-value: Coefficient of exposure to project	[0.018]	[0.004]	[0.002]	[0.004]
Mean of outcome		0.859		
Effect of one drought (2 SDs) (no project exposure)	0.00%	0.00%	0.93%	-0.47%
Effect of one drought (2 SDs) (project exposure)	-3.03%	-4.42%	-3.96%	-4.66%
Household controls	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63216	63216	63216	63216

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), an interaction of the SPEI index with a dummy variable indicating whether the respondent lives within a radius of 75km of four types of development projects, said dummy itself, as well as a variety of household characteristics, all of which are described in Table A1 in detail. The sectors of development projects are: (i) "government and civil society" and "other social infrastructure", (ii) "health" and "education", (iii) "water supply and sanitation", and (iv) "energy generation and supply". The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 12: Excluding Trust in Government and Institutions as a Mechanism

	Trust in government				Trust in institutions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Drought index	-0.025**	-0.024**	-0.029**	-0.029**	-0.031***	-0.031***	-0.034***	-0.033**
	(0.010)	(0.010)	(0.012)	(0.013)	(0.010)	(0.011)	(0.012)	(0.013)
Drought index x Chinese project (50km)	-0.045**				-0.001			
	(0.020)				(0.020)			
Drought index x Chinese project (100km)		-0.029				-0.001		
		(0.018)				(0.017)		
Drought index x World Bank project (50km)			-0.001				0.006	
			(0.016)				(0.017)	
Drought index x World Bank project (100km)				-0.000				0.003
				(0.016)				(0.017)
Coefficient of exposure to project	-0.069	-0.053	-0.030	-0.030	-0.031	-0.032	-0.027	-0.030
p-value: Coefficient of exposure to project	[0.001]	[0.002]	[0.024]	[0.014]	[0.133]	[0.053]	[0.053]	[0.018]
Mean of outcome	0.000				0.000			
Effect of one drought (2 SDs) (no project exposure)	-5.82%	-5.59%	-6.75%	-6.75%	-7.22%	-7.22%	-7.92%	-7.68%
Effect of one drought (2 SDs) (project exposure)	-16.07%	-12.34%	-6.98%	-6.98%	-7.22%	-7.45%	-6.29%	-6.98%
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76216	76216	76216	76216	76137	76137	76137	76137

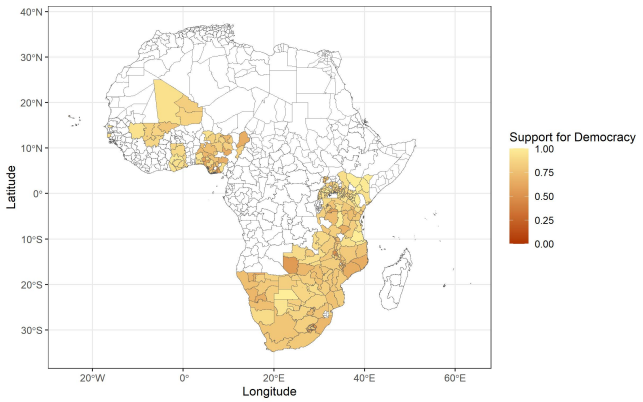
Notes: The table replicates Table 7, but changes the outcome to be trust in government (Columns 1—4) and trust in institutions (Columns 5—8).

Table 13: Conflict and the Support for Democracy

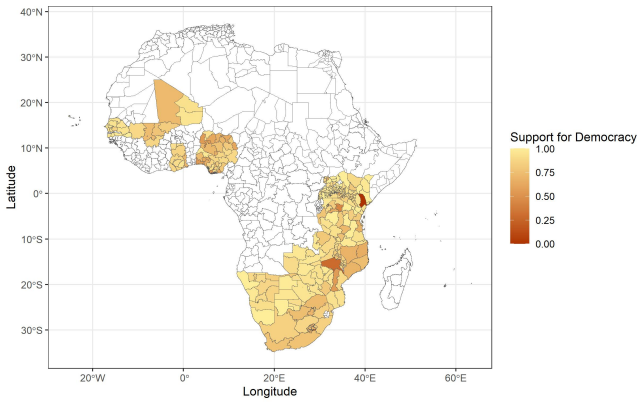
	Riots		Would attend demonstrations		Conflict event	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged drought index	-0.010	-0.014			0.010*	0.015**
	(0.009)	(0.011)			(0.006)	(0.007)
Lagged drought index x Chinese project (50km)	-0.047**				-0.007	
	(0.020)				(0.012)	
Lagged drought index x World Bank project (50km)		-0.011				-0.011
		(0.014)				(0.010)
Drought index			0.010**	0.018***		
			(0.004)	(0.005)		
Drought index x Chinese project (50km)			-0.006			
			(0.008)			
Drought index x World Bank project (50km)				-0.016**		
				(0.006)		
Coefficient of exposure to project	-0.056	-0.025	0.005	0.002	0.004	0.004
p-value: Coefficient of exposure to project	[0.007]	[0.047]	[0.574]	[0.749]	[0.766]	[0.621]
Mean of outcome	0.182		0.118		0.073	
Effect of one drought (2 SDs) (no project exposure)	-2.33%	-3.26%	2.33%	4.19%	2.33%	3.49%
Effect of one drought (2 SDs) (project exposure)	-13.0%	-5.82%	1.16%	0.47%	0.93%	0.93%
Household controls	Yes	Yes	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76900	76900	75560	75560	76900	76900

Notes: The table displays OLS regressions of dummy variables indicating (i) whether the respondent is exposed to a riot, (ii) whether a respondent would attend a demonstration or (iii) whether the respondent is exposed to a conflict event on the (lagged) 12 months Standardized Precipitation Evapotranspiration Index (SPEI), an interaction of the SPEI index with a dummy variable indicating whether the respondent lives within a radius of 50km of a Chinese or World Bank project, said dummy itself, as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

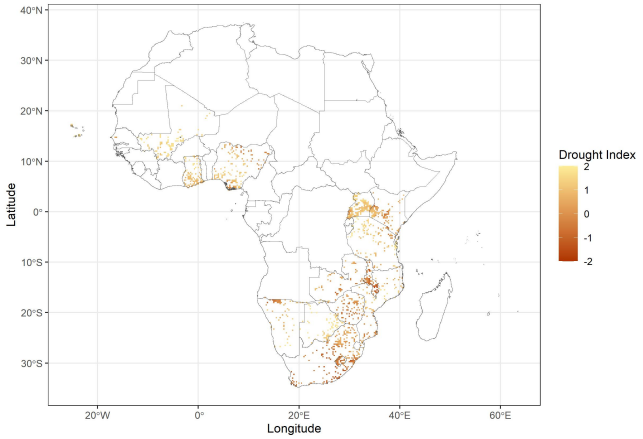
Figure 1: Distribution of the Support for Democracy and Drought Index



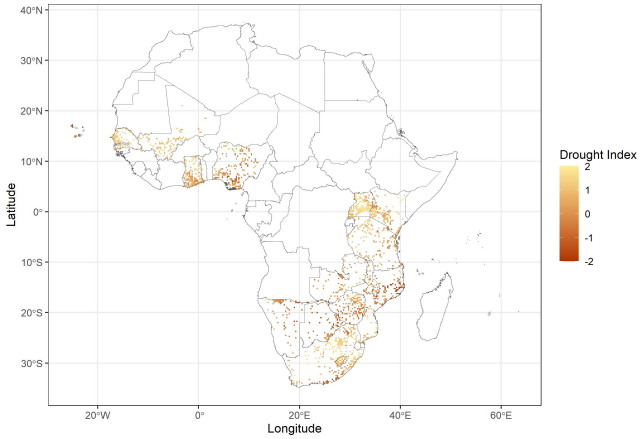
(a) Survey Round 2



(b) Survey Round 6



(c) Survey Round 2



(d) Survey Round 6

Notes: Panels A and B of the figure display the distribution of the support for democracy at the regional level in two survey rounds. Support for democracy is measured as a dummy variable indicating support for democracy vs. other systems of government at the individual level and is here aggregated to the regional level to preserve the anonymity of all respondents. Panels C and D of the figure displays the distribution of the drought index used in this paper, i.e., the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), across all grid cells that appear in the data in each survey round. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations.

A Appendix Tables and Figures

Table A1: Household Characteristics

	(1) Full Sample	(2) Eastern Africa	(3) Western Africa	(4) Southern Africa
Age	36.868	35.553	37.353	38.547
	(15.006)	(13.817)	(15.241)	(16.419)
High school education or more	0.270	0.242	0.244	0.352
	(0.444)	(0.428)	(0.429)	(0.478)
Male	0.498	0.498	0.499	0.497
	(0.500)	(0.500)	(0.500)	(0.500)
Race: black	0.946	0.992	0.904	0.915
	(0.226)	(0.091)	(0.295)	(0.279)
Race: white	0.012	0.002	0.004	0.035
	(0.107)	(0.043)	(0.067)	(0.185)
Religious	0.947	0.964	0.963	0.899
	(0.223)	(0.186)	(0.189)	(0.301)
Aligned with political party in power	0.518	0.519	0.394	0.645
	(0.500)	(0.500)	(0.489)	(0.479)
Employed (salaried)	0.345	0.333	0.376	0.329
	(0.475)	(0.471)	(0.484)	(0.470)
Occupation affected by climate change	0.710	0.747	0.737	0.600
	(0.454)	(0.435)	(0.440)	(0.490)
Observations	128988	61208	37870	29910

Notes: The table displays mean sample characteristics and standard deviations (in parentheses) for a variety of household characteristics. The variables displayed are the age of the respondent in years and dummy variables indicating (a) whether the respondent completed high school or more, (b) whether the respondent is male, (c) the race of the respondent (black or white), (d) whether the respondent is religious, (e) whether the respondent is aligned with the political party in power, (f) whether the respondent is employed, and (g) whether the respondent's occupation is affected by climate change. Column 1 displays the characteristics across the full sample, while Columns 2—4 split the sample by regions in Africa. All summary statistics are calculated across all survey rounds from the Afrobarometer surveys.

Table A2: Village Characteristics

	(1) Full Sample	(2) Eastern Africa	(3) Western Africa	(4) Southern Africa
Post office	0.206	0.139	0.210	0.315
	(0.404)	(0.346)	(0.407)	(0.465)
School	0.835	0.857	0.866	0.758
	(0.371)	(0.350)	(0.341)	(0.428)
Police station	0.300	0.297	0.299	0.306
	(0.458)	(0.457)	(0.458)	(0.461)
Electricity	0.584	0.448	0.696	0.678
	(0.493)	(0.497)	(0.460)	(0.467)
Piped water	0.520	0.327	0.598	0.751
	(0.500)	(0.469)	(0.490)	(0.433)
Sewage	0.255	0.149	0.306	0.372
	(0.436)	(0.356)	(0.461)	(0.483)
Health clinic	0.534	0.528	0.573	0.495
	(0.499)	(0.499)	(0.495)	(0.500)
Market stalls	0.594	0.675	0.540	0.523
	(0.491)	(0.468)	(0.498)	(0.499)
Urban	0.372	0.276	0.460	0.436
	(0.483)	(0.447)	(0.498)	(0.496)
Observations	128988	61208	37870	29910

Notes: The table displays mean sample characteristics and standard deviations (in parentheses) for a variety of village characteristics. The variables displayed are dummy variables indicating whether the respondent's village (a) has a post office, (b) has a school, (c) has a police station, (d) has access to electricity, (e) has access to piped water, (f) has a sewage system, (g) has a health clinic, (h) has market stalls, and (i) is urban. Column 1 displays the characteristics across the full sample, while Columns 2—4 split the sample by regions in Africa. All summary statistics are calculated across all survey rounds from the Afrobarometer surveys.

Table A3: Correlates of the Support for Democracy: Household Characteristics

	Respondent supports democracy								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Household Characteristics									
Age	0.000***								
	(0.000)								
High school education or more		0.017***							
		(0.003)							
Male			0.015***						
			(0.003)						
Race: black				0.026***					
				(0.010)					
Race: white					-0.053**				
					(0.022)				
Religious						0.022***			
						(0.007)			
Aligned with political party in power							0.024***		
							(0.004)		
Employed (salaried)								0.003	
								(0.003)	
Occupation affected by climate change									-0.008*
									(0.004)
Cell fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	101941	102750	102935	97120	97120	101724	70122	102596	50235

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on a variety of household characteristics, all of which are described in Table A1 in detail. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table A4: Correlates Political Preferences and Polity Measurement

	Respondent supports democracy	How democratic is country?	Trust in government	Trust in institutions	Capabilities of government	Freedom
	(1)	(2)	(3)	(4)	(5)	(6)
Polity score	0.000	0.079***	0.067***	0.033***	0.053***	0.070***
	(0.003)	(0.009)	(0.009)	(0.008)	(0.009)	(0.010)
Mean of outcome	0.859	2.766	0.000	0.000	0.000	0.000
Cell fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	102935	114925	126715	126759	127050	127575

Notes: The table displays OLS regressions of six outcomes on the polity measurement, a variable measuring the true level of democracy of a country and ranging from -10 (fully autocratic) to $+10$ (fully democratic). The outcomes are: (i) a dummy variable if the respondent supports democracy (vs. other systems of government), (ii) a variable ranging from 1 (not a democracy) to 4 (full democracy), indicating how much of a democracy respondents believe their country to be, and (iii) four indices measuring trust in government, trust in institutions, the capabilities of the government, and freedom. Each index is constructed in two steps. First, I average the components of the index, which are always dummy variables. Second, I standardize this average to get the final index. The trust in government index has three components: trust (a) in the president, (b) in parliament, and (c) in the local government. The institutions index has three components: trust (a) in the police, (b) in the courts, and (c) in the local army. The capabilities index has four components: the respondent's belief that the government is capable (a) of managing the economy, (b) of managing health services, (c) of managing education services, and (d) of fighting corruption. Finally, the freedom index has three components: perceived freedom of speech, freedom to join any political organization, and freedom to vote. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table A5: Validation of Drought Index

	Economic expectations	Food availability	Cash availability	Log(nightlights)	Conflict event
	(1)	(2)	(3)	(4)	(5)
Drought index	-0.036***	-0.070***	-0.069***		
	(0.008)	(0.015)	(0.016)		
Lagged drought index				-0.020**	0.012*
				(0.008)	(0.006)
Mean of outcome	0.621	3.934	3.011	1.388	0.073
Household controls	Yes	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes
Observations	51927	76695	76529	58718	76828

Notes: The table displays OLS regressions of various outcomes on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. The outcomes are: (i) a dummy variable indicating the respondent's economic expectations, (ii) two variables ranging from 1 (always) to 5 (never) indicating how often the respondent's household has gone without food or cash in the past year, (iii) the log of nightlights in the respondent's grid cell, and (iv) a dummy indicating whether the respondent's grid cell has been exposed to a conflict event. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table A6: Effects by Country

Effect of Floods	Null Effect	Effect of Droughts
Zimbabwe (-8.79%)	Botswana	Cape Verde (-18.1%)
South Africa (-8.67%)	Ghana	Tanzania (-9.61%)
	Lesotho	Senegal (-8.12%)
	Malawi	Zambia (-8.01%)
	Mali	Kenya (-5.07%)
	Mozambique	
	Namibia	
	Nigeria	
	Uganda	

Notes: The table replicates the regression from Column 1 in Table 3 for each country in the sample individually and reports the percentage effect of a disaster for each country where the effect is significant.

Table A7: Heterogeneous Effects

	Respondent supports democracy								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Drought index	-0.018*	-0.013*	-0.016*	-0.012**	-0.015**	-0.013**	-0.011**	-0.011**	-0.011**
	(0.011)	(0.007)	(0.009)	(0.005)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)
Drought index x no. years democracy	0.000								
	(0.001)								
Drought index x local state capacity		0.000							
		(0.001)							
Drought index x lagged log(nightlights)			-0.001						
			(0.005)						
Drought index x lagged conflict event				0.006					
				(0.011)					
Drought index x econ. expectations					-0.004				
					(0.006)				
Drought index x employed						0.003			
						(0.004)			
Drought index x educated							-0.000		
							(0.005)		
Drought index x male								-0.001	
								(0.004)	
Drought index x urban									0.001
									(0.007)
Coefficient of index + interaction	-0.018	-0.013	-0.017	-0.005	-0.019	-0.009	-0.012	-0.012	-0.10
p-value: Coefficient of index + interaction	[0.086]	[0.059]	[0.004]	[0.641]	[0.004]	[0.099]	[0.038]	[0.025]	[0.136]
Mean of outcome					0.859				
Effect of one drought (2 SDs) (no interaction)	-4.19%	-3.03%	-3.73%	-2.79%	-3.49%	-3.03%	-2.56%	-2.56%	-2.56%
Effect of one drought (2 SDs) (interaction)	-4.19%	-3.03%	-3.96%	-1.16%	-4.42%	-2.10%	-2.79%	-2.79%	-2.33%
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	63077	62471	48722	63077	43673	63077	63077	63077	62337

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household characteristics, all of which are described in Table A1 in detail. All columns add an interaction of the SPEI index with a variable and that variable itself. The variables added measure: (i) the number of years the respondent's country has been a democracy since 1990, (ii) local state capacity, (iii) lagged values of the log of nightlights in the respondent's grid cell, (iv) lagged values of a dummy indicating whether the respondent's grid cell has been exposed to a conflict event, (v) the respondent's economic expectations, (vi) the respondent's employment status, (vii) the respondent's education, (viii) the respondent's gender, and (ix) whether the respondent lives in an urban area. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table A8: Views on China and International Organizations

	(1) Full Sample	(2) Eastern Africa	(3) Western Africa	(4) Southern Africa
A. General Views				
Chinese aid is useful	0.622	0.630	0.668	0.555
	(0.485)	(0.483)	(0.471)	(0.497)
Best model for my country: China	0.279	0.295	0.278	0.255
	(0.449)	(0.456)	(0.448)	(0.436)
Best model for my country: US	0.347	0.333	0.412	0.288
	(0.476)	(0.471)	(0.492)	(0.453)
Best model for my country: UN/WB	0.055	0.052	0.061	0.052
	(0.228)	(0.221)	(0.240)	(0.223)
Most influence on my country: China	0.314	0.378	0.218	0.324
	(0.464)	(0.485)	(0.413)	(0.468)
Most influence on my country: US	0.240	0.256	0.252	0.196
	(0.427)	(0.437)	(0.434)	(0.397)
B. Chinas has [...] on my country				
a lot of economic influence	0.806	0.796	0.836	0.785
	(0.396)	(0.403)	(0.370)	(0.411)
a positive influence	0.734	0.747	0.769	0.669
	(0.442)	(0.435)	(0.421)	(0.471)
C. Factors explaining positive Chinese image				
Infrastructure and business investments	0.577	0.597	0.527	0.605
	(0.494)	(0.491)	(0.499)	(0.489)
D. International Organizations				
United Nations do a good job (0-10)	6.732	6.933	6.860	6.274
	(2.646)	(2.685)	(2.531)	(2.663)
World Bank does a good job (0-10)	6.726	6.971	6.938	5.971
	(2.630)	(2.663)	(2.489)	(2.622)
Observations (Panels A, B, C)	29948	15558	8400	5990
Observations (Panel D)	23486	10913	6582	5991

Notes: The table displays mean sample characteristics and standard deviations (in parentheses) for a variety of variables related to China and international organizations. The variables in the table indicate (a) whether China's overall economic development assistance is doing a good job of meeting the country's needs, (b) which country or international organization is the best model for the future development of the respondent's country, (c) which country has the most influence on the respondent's country, (d) whether China has a lot of economic influence on the respondent's country, (e) whether China has a positive economic and political influence on the respondent's country, (f) whether infrastructure and business investments are factors explaining the positive Chinese image, (g) whether the United Nations do their job well, and (h) whether the World Bank does its job well. Variables in Panels A, B, and C rely on data from the sixth round of the Afrobarometer surveys, while the two questions in Panel D are from the second round of the Afrobarometer surveys.

Table A9: Views of China, the US, International Organizations, and the Support for Democracy

	Respondent supports democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Best model for my country: China	-0.015*				-0.022**	
	(0.008)				(0.009)	
World Bank does a good job (0-10)		-0.005**				-0.005**
		(0.002)				(0.003)
Best model for my country: US			0.017**			
			(0.008)			
United Nations do a good job (0-10)				0.000		
				(0.002)		
Mean of outcome	0.859					
Not living within 10km of project	No	No	No	No	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes
Country by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13175	6551	13175	6913	11604	4995

Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on, in Columns 1 and 3, a dummy variable indicating whether the respondent believes that, respectively, China or the US are the best model for the future development of the respondent's own country and, in Columns 2 and 4, variables indicating whether the United Nations or the World Bank are doing their job well, as well as a variety of household characteristics, all of which are described in Table A1 in detail. Columns 5 and 6 recreate Columns 1 and 2 but drop individuals living within 10km of, respectively, a Chinese or World Bank project. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table A10: Extreme Weather Events and the Exposure to Alternatives to Democracy

	Respondent will be exposed to:			
	Chinese project		World Bank project	
	50km	100km	50km	100km
	(1)	(2)	(3)	(4)
Drought index	-0.011	-0.001	-0.013*	-0.010*
	(0.009)	(0.008)	(0.007)	(0.006)
Mean of outcome	0.128	0.183	0.072	0.058
Household controls	Yes	Yes	Yes	Yes
Country by year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	76900	76900	76900	76900

Notes: The table displays OLS regressions of dummy variables indicating whether a respondent lives within 50km or 100km of a location where a Chinese or World Bank project will be built in the future on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table A11: Democracy and the Exposure to Alternatives to Democracy

	Democracy index			
	(1)	(2)	(3)	(4)
Inactive Chinese project (50km)	0.015			
	(0.025)			
Active Chinese project (50km)	-0.020			
	(0.022)			
Inactive Chinese project (100km)		0.021		
		(0.026)		
Active Chinese project (100km)		-0.002		
		(0.022)		
Inactive World Bank project (50km)			0.031	
			(0.027)	
Active World Bank project (50km)			0.013	
			(0.024)	
Inactive World Bank project (100km)				0.062*
				(0.033)
Active World Bank project (100km)				0.050*
				(0.028)
DiD coefficient	-0.035	-0.023	-0.018	-0.012
p-value: DiD coefficient	[0.176]	[0.301]	[0.457]	[0.668]
Mean of outcome	0.000			
Household controls	Yes	Yes	Yes	Yes
Country by year fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	76523	76523	76523	76523

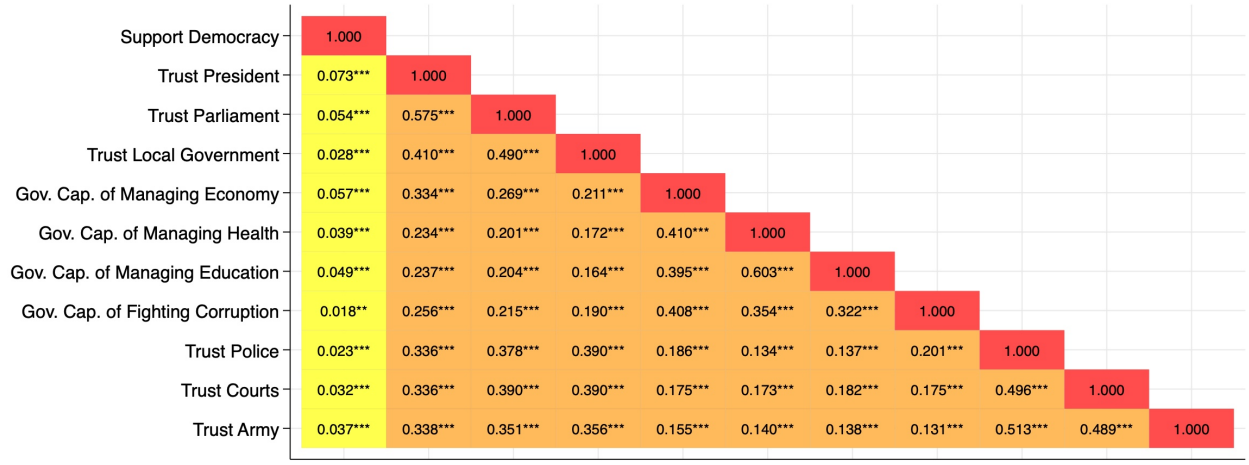
Notes: The table displays OLS regressions of a democracy index on dummy variables indicating whether in a radius of, respectively, 50km or 100km from where the respondent resides a Chinese or World Bank project will exist in the future ("inactive project") or already exists ("active project"), as well as a variety of household characteristics, all of which are described in Table A1 in detail. The democracy index is constructed in two steps. First, I average the components of the index, which are dummy variables. Second, I standardize this average to get the final index. The index consists of four variables: (i) no support for one party rule, (ii) no support for army rule, (iii) no support for one man rule (i.e., abolishing parliament and elections), and (iv) support for democracy (vs. other systems of government). Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table A12: Robustness of Results to Different Radii

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.004	-0.004	0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.005)
Drought index x Chinese project (20km)	-0.021**			
	(0.009)			
Drought index x Chinese project (30km)		-0.019**		
		(0.008)		
Drought index x World Bank project (20km)			-0.019***	
			(0.007)	
Drought index x World Bank project (30km)				-0.017**
				(0.007)
Coefficient of exposure to project	-0.025	-0.023	-0.018	-0.015
p-value: Coefficient of exposure to project	[0.009]	[0.010]	[0.006]	[0.011]
Mean of outcome		0.859		
Effect of one drought (2 SDs) (no project exposure)	-0.93%	-0.93%	0.23%	0.23%
Effect of one drought (2 SDs) (project exposure)	-5.82%	-5.36%	-4.19%	-3.49%
Household controls	Yes	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63216	63216	63216	63216

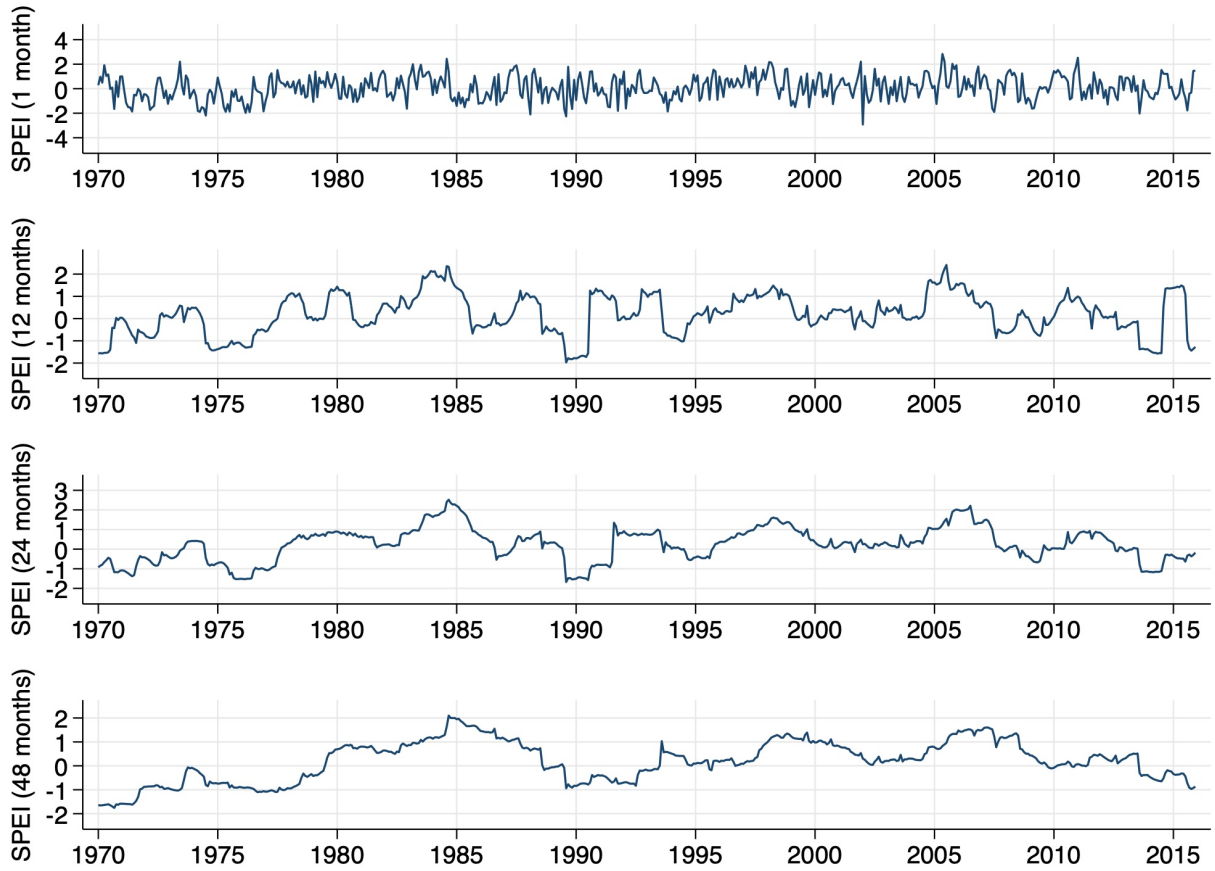
Notes: The table replicates Table 7, but changes the radius of exposure to Chinese and World Bank development projects to 20km and 30km (instead of 50km and 100km).

Figure A1: Raw Correlations Between Political Preferences



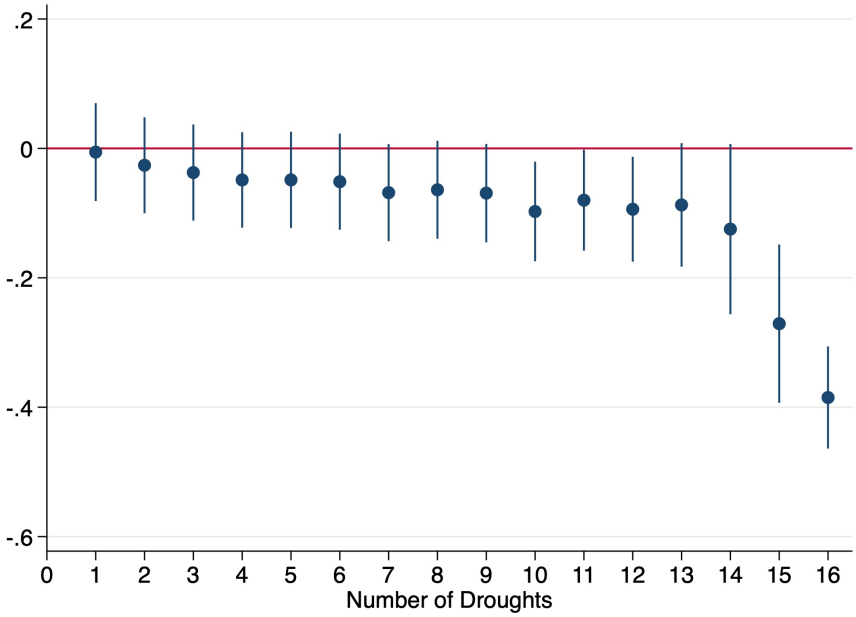
Notes: The figure displays correlations between my main outcome variable (the support for democracy vs. other systems of government) with other political variables using data from the latest survey round only. These are: (i) the respondent's trust in the president, the parliament, and the local government, (ii) the respondent's belief in the government's capabilities of managing the economy, managing health services, managing education services, and fighting corruption, and (iii) the respondent's trust in the police, the courts, and the army.

Figure A2: Four Timescales of the Drought Index

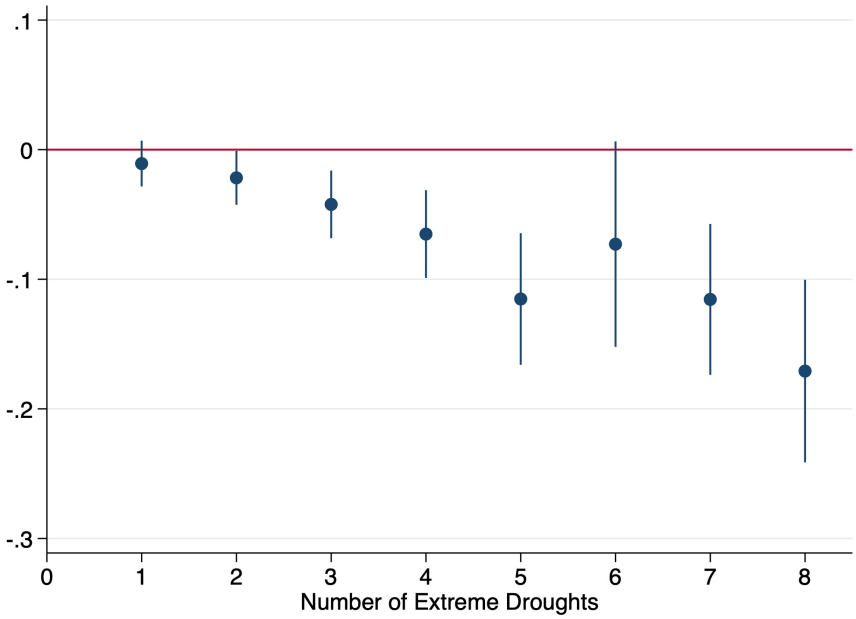


Notes: The figure displays four different drought indices—the 1, 12, 24, and 48 months SPEI index—in Dakar (Senegal) from January 1970 until December 2015.

Figure A3: Cumulative Effects of Droughts on the Support for Democracy



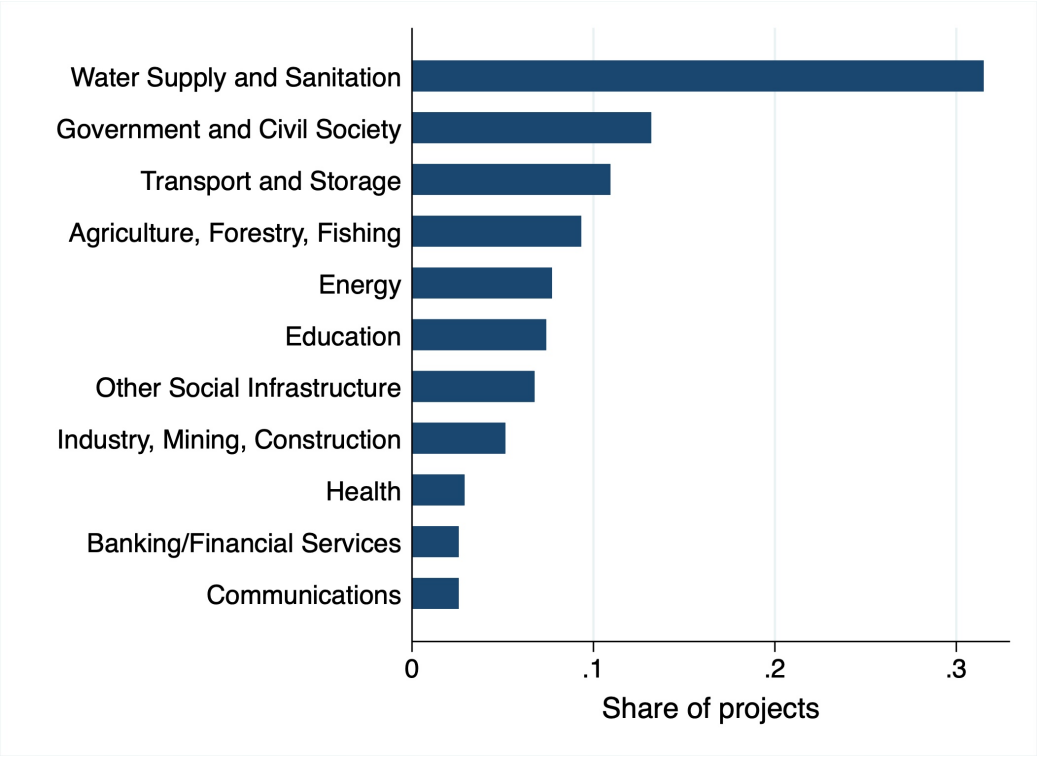
(a) Cumulative Exposure to Droughts



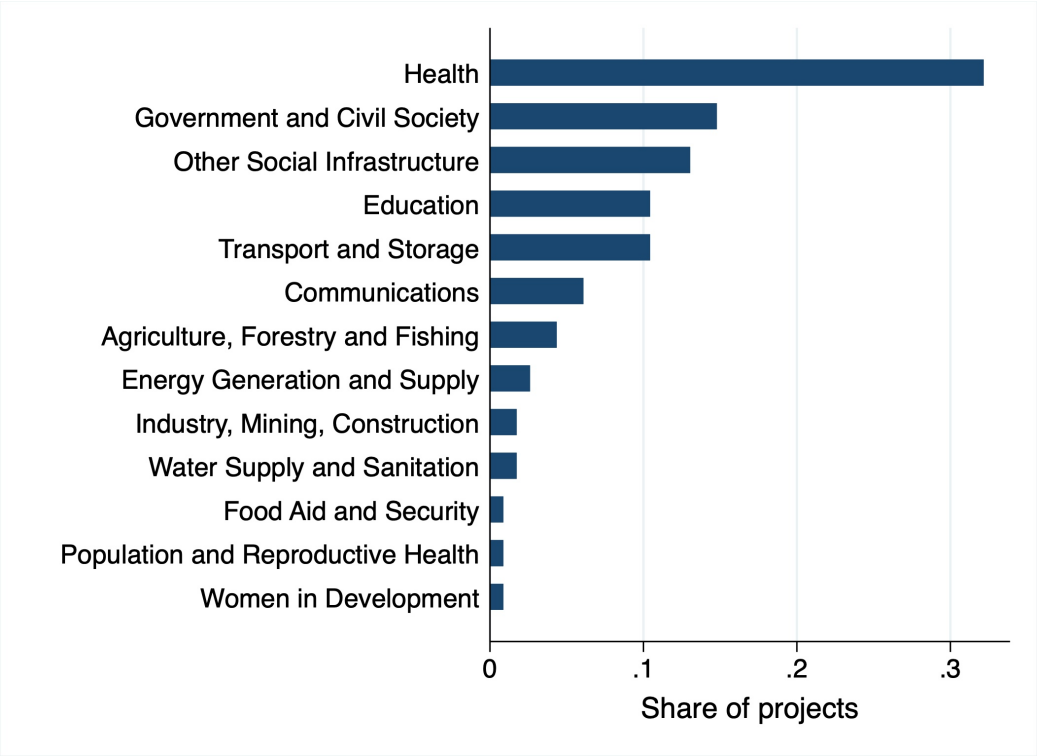
(b) Cumulative Exposure to Extreme Droughts

Notes: The figure displays the coefficients from OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on dummy variables indicating how many drought years (Panel A) or extreme drought years (Panel B) the respondent has been exposed to throughout their lifetime, as well as a variety of household characteristics, all of which are described in Table A1 in detail. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Figure A4: Development Projects funded by the World Bank and China by Sector



(a) World Bank Development Projects



(b) Chinese Development Projects

Notes: The figure displays the share of development projects funded by the World Bank (Panel A) and China (Panel B) by sector across time.

B Robustness Tests

Heterogeneous treatment effects. The recent literature on heterogeneous treatment effects, summarized by De Chaisemartin and d'Haultfoeuille (2022*b*) and Roth et al. (2023), shows that the assumption underlying simple TWFE regression is one of homogeneous treatment effects, i.e., β in equation (1) is assumed to be constant across geography and time.[56,57]

To my knowledge, the only paper that allows for continuous treatments at every period in the sample is de Chaisemartin et al. (2022). Intuitively, the procedure they propose is as follows (in the case of multiple time periods). First, one estimates the treatment effects they propose (relying on their "did_multiplegt" package) for each consecutive pair of time periods. In my case, given my five survey waves, this yields four estimates (i.e., one for survey waves two to three, a second for survey waves three to four, etc.). Each treatment effect essentially compares switchers (i.e., individuals who changes their treatment from one period to the other) to stayers (i.e., individuals who did not change their treatment from one period to the other) conditional on them having had the same treatment status in the initial period (sections 4.3 and 5.3). Second, one calculates weights to take a weighted average and calculate the overall treatment effect (see Point 1 in Theorem 8 in section 5.3 for the weights).

While there are multiple differences between my set-up and theirs, two are especially relevant. First, there are no stayers in my sample as the values of the drought index always change for everyone (i.e., the weather is never the same at two time periods). Second, there are (almost) no individuals (or grid cells) with the same value of the drought index at the initial treatment period (i.e., the first time period of the two). The first issue can be resolved by specifying a number such that individuals whose treatment changes by less than said number between two subsequent periods act as "quasi-stayers." The second issue cannot be addressed and, if I run

[56] More specifically, the TWFE regressions, under a parallel trend assumption, estimate a weighted sum of treatment effects across geography and time, with some negative weights. Due to these negative weights, the overall treatment effect might, for example, be negative even if the treatment effect is positive for every unit $\times$ period.

[57] Three types of estimators have been proposed to address this issue. The first type applies to designs with binary and absorbing treatments (Borusyak et al., 2021; Callaway and Sant'Anna, 2021; Sun and Abraham, 2021). The second type extends this and applies to binary or discrete treatments (De Chaisemartin and d'Haultfoeuille, 2020; De Chaisemartin and d'Haultfoeuille, 2022*a*). The third type of estimators allows for continuously distributed treatments, but imposes that all units start with no treatment (De Chaisemartin and d'Haultfoeuille, 2022*a*). Neither directly applies to my setting as the drought index is continuously distributed at every period in my sample.

their procedure, significantly reduces the sample size in my case. Specifically, each estimator in the first step of the procedure is estimated with a sample size of roughly 800-1000 observations. Given that my original sample contains 129,002 observations, relying on at best 5,000 of these to conduct a robustness test is suboptimal. It follows that unfortunately even this procedure is not applicable in my setting.[58]

To at least improve on the homogeneous treatment effects assumption from my main results, I therefore rely on Wooldridge (2021). Wooldridge (2021) proposes a simple two-step procedure to deal with heterogeneous treatment effects. Step 1 of the procedure consists of running the TWFE regression at the desired "level of heterogeneity." In my case, I estimate equation (1) at the country level, yielding 16 βs. In terms of econometric assumptions, this assumes homogeneous treatment effects within each country (and over time). While this may still not be fully realistic, it is a step in the right direction since assuming that treatment effects are constant within a country is a much milder assumption than the assumption that they are constant across all 16 countries. Step 2 of the procedure aggregates these 16 βs by taking a simple average. I bootstrap standard errors.

Table B1 displays the final results of the procedure. The table shows that the main results from Table 3 are unchanged and therefore robust.

Sample selection. Sample selection presents a serious concern for the analysis presented in this paper. The assumption of no selected sample refers to the possibility that: (i) natural disasters can affect the roll out of the Afrobarometer surveys, (ii) conditional on the roll out of the surveys, the Afrobarometer interviews different "types" of individuals, and (iii) individuals exhibit adaptation behavior (e.g., they migrate) due to natural disasters and thus change the composition of the sample.

Timing of survey. Table B2 regresses the number of days needed to conduct all interviews within a region or subregion (Columns 1—4) or the number of people interviewed within a region or subregion (Columns 5—8) on dummy variables indicating whether the region or subregion

[58] If I nonetheless run their procedure, relying on a variety of different threshold values and bootstrapping standard errors, the resulting estimates are always positive and larger in magnitude than my estimates from Table 3.

was hit by a (extreme) disaster (and a full set of unit and time fixed effects). With the exception of one coefficient, the table suggests that (extreme) disasters do not affect the outcomes, thus suggesting that neither droughts nor floods affect the timing of the survey.[59]

Balancedness of interviewees. Table B3 compares household and village characteristics between respondents interviewed before and after a (extreme) disaster hit a region where the interview process took more than one month. The table shows that the characteristics are largely balanced, thus suggesting that, conditional on the roll out of the survey, the Afrobarometer's targeting of individuals is not affected by natural disasters.

Similarly, Table B4 regresses the household characteristics on the continuous measure of the drought index and finds no correlation (except on employment where one expects an effect).

Adaptation behavior. There is ample evidence that individuals adapt to climate change. The most concerning adaptation behavior in my case is migration in response to climate change (e.g., Burzyński et al., 2022; Castells-Quintana et al., 2022; Conte, 2022). There are two types of migration: across country migration and within country migration. To address the former, Table B5 reproduces Column 1 of Table 3 but, one by one, drops the four countries in my sample with the largest number of emigrants. The results remain unchanged. I unfortunately do not have data within country migration flows and therefore have to assume that individuals do not endogenously migrate away from drought hit regions within countries.

Leads. Table B6 adds a 12 month lead of the drought index, showing that the main results in Table 3 are unchanged and ruling out pre-trends.

Other drought measurements. Table B7 considers two other ways of measuring droughts. Both confirm the main result. First, Columns 1 and 2 utilize a drought dummy and show that the main results from Table 3 are unchanged. Second, Column 3 relies on the 3 months drought index and three of its lags. As can be seen, the second lag has a significant negative effect, similar in magnitude as the main effect in Column 1 of Table 3. This suggests that the impact of a drought shock on respondents' support for democracy is lagged by roughly half a year.

[59]The results remain unchanged when regressing these outcomes on my continuous drought index.

Six other robustness checks. Table B8 presents six further robustness checks. First, in Column 1, I follow Conley (1999) and use a spatial correction to calculate standard errors with a threshold of 300km. Second, Column 2 adds strata fixed effects (instead of grid cell fixed effects). In the Afrobarometer, every region (state) in each country has two strata: one for urban households and one for rural households. Third, Column 3 removes all controls. Fourth, Column 4 includes only age, gender, and education as controls. Fifth, Column 5 goes back to the original specification from equation (1), but adds weather controls (temperature and precipitation and their squares, measured in degrees Celsius and mm, respectively). Finally, Column 6 also relies on the main specification from equation (1), but adds village controls (see Table A2). My main specification is robust to all these alternative specifications.

Table B1: Heterogeneous Treatment Effects (Wooldridge, 2021)

	Respondent supports democracy			
	Coding 1		Coding 2	
	(1)	(2)	(3)	(4)
Drought index	-0.019***	-0.015**	-0.018***	-0.019***
	(0.005)	(0.006)	(0.006)	(0.007)
Lagged drought index (1 year)		-0.006		-0.009
		(0.005)		(0.006)
Lagged drought index (2 years)		-0.001		-0.003
		(0.005)		(0.006)
Mean of outcome	0.859		0.682	
Effect of one drought (2 SDs)	-4.42%	-3.49%	-5.28%	-5.57%
Lagged effect of one drought (2 SDs)		-1.40%		-2.64%
Lagged effect of one drought (2 SDs)		-0.23%		-0.88%
Household controls	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	63077	63077	76792	76792

Notes: The table displays robustness checks to the main results in Table 3, following the procedure described in Wooldridge (2021). The coefficients displayed stems from OLS regressions of two codings of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), as well as a variety of household characteristics, all of which are described in Table A1 in detail. The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level. Step 1 of the procedure consists of country level regressions in the same spirit as the ones run in Table 3. Step 2 of the procedure aggregates these individual effects by taking a simple average. The standard errors are bootstrapped in step 2.

Table B2: Sample Selection: Roll Out of Survey

	Nr. days needed for interviews				Nr. people interviewed			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Region hit by disaster	0.162				-2.015			
	(0.650)				(6.204)			
Subregion hit by disaster		0.068				2.283		
		(0.189)				(3.056)		
Region hit by extreme disaster			4.067**				15.104	
			(2.046)				(17.043)	
Subregion hit by extreme disaster				-0.934				4.608
				(0.954)				(10.265)
Mean of outcome	8.78	4.46	8.78	4.46	155	64.7	155	64.7
Region level	Yes	No	Yes	No	Yes	No	Yes	No
Subregion level	No	Yes	No	Yes	No	Yes	No	Yes
Region/Subregion fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey round fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at region x survey level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	129002	129002	129002	129002	129002	129002	129002	129002

Notes: The table displays OLS regressions of a variable indicating the number of days needed to conduct all interviews within a (sub)region (Columns 1—4) or the number of people interviewed within a (sub)region (Columns 5—8) on a dummy variable indicating whether that region/subregion was hit by a disaster (i.e., a flood or drought) or an extreme disaster (i.e., an extreme flood or extreme drought). Regressions include (sub)region and survey wave fixed effects and cluster standard errors at the (sub)region × survey wave level.

Table B3: Sample Selection: Balance of Household and Village Characteristics

	Age	Educated	Male	Black	White	Religious	Politically aligned	Employed	Occ Affected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Interviewed after disaster	-1.371*	0.024	0.016*	-0.010	-0.001	-0.016	-0.022	0.009	-0.003
	(0.757)	(0.040)	(0.009)	(0.033)	(0.014)	(0.015)	(0.029)	(0.033)	(0.032)
Region x survey wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at region x survey level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3442	3491	3503	3196	3196	3423	2149	3482	1788

	Post office	School	Police station	Electricity	Piped water	Sewage	Health clinic	Market stalls	Urban
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Interviewed after disaster	-0.002	-0.039	-0.023	-0.050	0.034	-0.070	-0.037	-0.003	0.002
	(0.042)	(0.039)	(0.044)	(0.057)	(0.052)	(0.041)	(0.055)	(0.058)	(0.061)
Region x survey wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at region x survey level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3412	3483	3416	3479	3477	3453	3414	3478	3336

	Age	Educated	Male	Black	White	Religious	Politically aligned	Employed	Occ Affected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Interviewed after extreme disaster	-1.140	-0.011	0.009	0.054	0.025	0.017	-0.075	-0.093	-0.025
	(1.330)	(0.056)	(0.016)	(0.033)	(0.040)	(0.023)	(0.052)	(0.049)	(0.073)
Region x survey wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at region x survey level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1108	1111	1114	1114	1114	1086	657	1111	726

	Post office	School	Police station	Electricity	Piped water	Sewage	Health clinic	Market stalls	Urban
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Interviewed after extreme disaster	0.158	0.094	0.089*	-0.024	-0.279	-0.075	0.149*	0.154*	-0.249
	(0.151)	(0.088)	(0.040)	(0.183)	(0.170)	(0.063)	(0.067)	(0.073)	(0.200)
Region x survey wave fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at region x survey level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1114	1114	1114	1114	1114	1114	1109	1114	1114

Notes: This table compares household and village characteristics between respondents interviewed before and after a disaster (i.e., a flood or drought) or an extreme disaster (i.e., an extreme flood or extreme drought) hit a region where the interviewing process took more than one month. The coefficients come from a regression of the household or village characteristic in question on a dummy indicating whether the respondent was interviewed after the disaster or extreme disaster hit the region. Regressions include region × survey wave fixed effects and cluster standard errors at the region × survey wave level.

Table B4: Sample Selection: Further Balance of Household Characteristics

	Age	Educated	Male	Black	White	Religious	Politically aligned	Employed	Occ Affected
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SPEI (12 months)	-0.152	0.001	0.000	0.007*	-0.001	-0.000	-0.001	0.020***	0.016**
	(0.117)	(0.004)	(0.001)	(0.004)	(0.001)	(0.002)	(0.007)	(0.004)	(0.008)
Cell fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	127300	128684	128985	121307	121307	127367	86163	128443	65143

Notes: This table regresses a variety of household controls on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI). The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table B5: Sample Selection: International Migration

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.012**	-0.015***	-0.014***	-0.015***
	(0.005)	(0.005)	(0.005)	(0.006)
Mean of outcome		0.859		
Effect of one drought (2 SDs)	-2.79%	-3.49%	-3.26%	-3.49%
Household controls	Yes	Yes	Yes	Yes
Uganda dropped	Yes	Yes	Yes	Yes
Zimbabwe dropped	No	Yes	Yes	Yes
Tanzania dropped	No	No	Yes	Yes
Senegal dropped	No	No	No	Yes
Cell fixed effects	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	58094	54477	49348	46788

Notes: The table replicates Column 1 of Table 3 but, one by one, drops the countries in my sample with the highest number of emigrants (Uganda, Zimbabwe, Tanzania, Senegal).

Table B6: Robustness of Main Results to Inclusion of Leads

	Respondent supports democracy			
	Coding 1		Coding 2	
	(1)	(2)	(3)	(4)
Lead of drought index (1 year)	0.004	0.004	-0.002	-0.002
	(0.004)	(0.004)	(0.005)	(0.005)
Drought index	-0.015***	-0.016***	-0.027***	-0.026***
	(0.005)	(0.005)	(0.005)	(0.005)
Lagged drought index (1 year)		0.001		-0.009*
		(0.004)		(0.005)
Lagged drought index (2 years)		0.003		-0.005
		(0.004)		(0.005)
Mean of outcome	0.859		0.682	
Lead effect of one drought (2 SDs)	0.93%	0.93%	-0.59%	-0.59%
Effect of one drought (2 SDs)	-3.49%	-3.73%	-7.92%	-7.62%
Lagged effect of one drought (2 SDs)		0.23%		-2.64%
Lagged effect of one drought (2 SDs)		0.70%		-1.47%
Household controls	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes
Observations	57402	57402	69604	69604

Notes: The table replicates Table 3, adding a one year lead of the drought index to every regression.

Table B7: Robustness to Different Drought Measures

	Respondent supports democracy		
	(1)	(2)	(3)
Drought dummy	-0.093**	-0.091**	
	(0.047)	(0.045)	
Lagged drought dummy (1 year)		0.035	
		(0.029)	
Lagged drought dummy (2 years)		0.004	
		(0.016)	
3 Months drought index			-0.000
			(0.004)
Lagged drought index (3-6 months)			0.007
			(0.005)
Lagged drought index (6-9 months)			-0.010**
			(0.005)
Lagged drought index (9-12 months)			0.001
			(0.004)
Mean of outcome		0.859	
Household controls	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes
Observations	63077	63077	63077

Notes: The table replicates Column 1 of Table 3, but changes the variable used to measure drought occurrences. Columns 1 and 2 rely on a dummy variable indicating a drought, constructed from the 12 months Standardized Precipitation Evapotranspiration Index (SPEI). The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Column 3 uses the 3 months version of the SPEI index (instead of the usual 12 months SPEI index used in the paper).

Table B8: Further Robustness Tests

	Respondent supports democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Drought index	-0.010**	-0.009**	-0.010**	-0.010**	-0.009*	-0.015***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Mean of outcome				0.859		
Effect of one drought (2 SDs)	-2.33%	-2.10%	-2.33%	-2.33%	-2.10%	-3.49%
Selected household controls	No	No	No	Yes	No	No
Household controls	Yes	Yes	No	No	Yes	Yes
Village controls	No	No	No	No	No	Yes
Weather controls	No	No	No	No	Yes	No
Cell fixed effects	Yes	No	Yes	Yes	Yes	Yes
Strata fixed effects	No	Yes	No	No	No	No
Month by year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	No	Yes	Yes	Yes	Yes	Yes
Conley SEs	Yes	No	No	No	No	No
Observations	63219	62473	102935	101768	62319	58649

Notes: The table replicates Column 1 of Table 3 but, in Column 1, follows Conley (1999) and uses a spatial correction with a threshold of 300km, in Column 2, includes strata fixed effects, in Column 3, removes all controls, in Column 4, includes only age, gender, and education as controls, in Column 5, controls for weather controls (temperature and precipitation and their squares, measured in degrees Celsius and mm, respectively), and, in Column 6, adds a variety of village controls, all of which are described in Table A2.