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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 pressing global challenges. This paper establishes a link between individuals' support for democracy and extreme weather events, such as droughts, in the context of sub-Saharan Africa—a region highly vulnerable to climate change and where democratic norms are fragile. I analyze this relationship using Afrobarometer data on support for democracy from 2002 to 2015, covering 129,002 individuals across 16 countries, combined with granular weather data from 1960 to 2015 at a 27km × 27km grid cell resolution. I find that exposure to drought reduces support for democracy by 2.56%, but that this effect is limited to individuals living in established democracies. I further explore how this weakening of democratic norms is linked to exposure to non-democratic governance systems, proxied by proximity to development projects funded by autocratic regimes. I find that the effect of droughts on support for democracy is significant only for individuals exposed to autocratic systems. Finally, I provide suggestive evidence that this reduction in support for democracy is associated with lower political engagement, as measured by participation in demonstrations. These findings highlight the political costs of climate change in developing countries.

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

A growing body of evidence suggests that voters systematically punish incumbents for adverse exogenous shocks, even when these shocks are beyond the government's control (e.g., Wolfers, 2002; Leigh, 2009; Healy et al., 2010; Achen and Bartels, 2012, 2017). This is often interpreted as evidence of voter irrationality. However, recent work suggests that such shocks may serve as signals, allowing voters to update their beliefs about government competence (Ashworth et al., 2018).[1] For instance, a drought may expose a state's true capacity for disaster preparedness, making it rational for voters to revise their support for the incumbent.

This paper extends this logic beyond incumbents to political systems more broadly. If voters update their beliefs about individual leaders in response to exogenous shocks, do they also update their beliefs about the optimal political system?

Classical theories of democratization in political science emphasize that the level and survival of democracy hinge on the population's support for it (e.g., Lipset, 1959; Almond and Verba, 1963; Easton, 1965).[2] With populist governments gaining increasing traction globally, support for democracy declining, and polarization rising (Guriev and Papaioannou, 2022), understanding the determinants of support for democracy has become a first-order concern (Mauk, 2020).

Amid these challenges, global issues like climate change, one of the most pressing policy challenges worldwide (IPCC, 2021), profoundly affect societies and governance systems (Besley and Burgess, 2002; Kahn, 2005; Dell et al., 2014; Carleton and Hsiang, 2016; Cao, 2024), raising important questions about its implications for individuals' attitudes toward democracy.

This paper empirically examines the relationship between climate change and support for democracy in sub-Saharan Africa (SSA). The region offers a unique context for studying this relationship, as it is highly vulnerable to the effects of climate change, which has already led to significant economic challenges (e.g., IDA, 2021). Moreover, the relatively slow pace of democratization in SSA since 2000, combined with widespread ambivalence toward democracy among the population, suggests that climate change could influence support for democracy.

To measure individuals' support for democracy, I use geolocated data from five rounds of

[1] This holds regardless of government relief efforts. A related literature finds that relief efforts can mitigate electoral punishment (e.g., Cole et al., 2012; Healy and Malhotra, 2010).

[2] For empirical evidence, see Claassen (2020*a*). Figure A1 shows a positive correlation in my sample between changes in support for democracy and changes in levels of democracy over time.

the Afrobarometer surveys conducted in 16 SSA countries between 2002 and 2015. The primary outcome is a binary variable indicating whether individuals support democratic systems or are open to non-democratic alternatives. Across all countries and survey waves, 68.2% of respondents express support for democracy.

I use the Standardized Precipitation Evapotranspiration Index (SPEI), developed by Vicente-Serrano et al. (2010), as a proxy for climate change, focusing on long-term droughts. The proxy reflects the scientific consensus that anthropogenic climate change exacerbates the frequency and intensity of natural disasters, including droughts and floods (IPCC, 2021). The SPEI is a standardized, continuous index where negative values represent wet conditions and positive values indicate drought-like conditions. As such, it captures both droughts and floods.

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

In the first part of the paper, I document a significant relationship between extreme weather events and support for democracy. My baseline results indicate that droughts decrease support for democracy by 2.56%. However, this effect is concentrated among individuals living in established democracies and those who perceive their country as democratic. In contrast, in countries classified as (perceived) autocracies, droughts have no significant impact on support for democracy.

Droughts lead to a comparable decline in respondents' trust in government, trust in institutions, and perceptions of government effectiveness. The fact that droughts diminish individuals' assessments of government ability—which I interpret as a proxy for perceived (local) state capacity—supports the idea that droughts can act as signals to citizens. On one hand, droughts may reveal information about the government's true competence by highlighting its response to the crisis. On the other hand, if individuals associate droughts with broader climate change patterns, they may use them to evaluate their government's overall approach to managing climate challenges.

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 randomness of weather shocks within a given location and time period is well established in the literature, though I discuss it further in the main text. 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 rollout of the Afrobarometer surveys, (ii) conditional on the rollout 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 pose concerns for my analysis.

The second part of the paper investigates why droughts reduce support for democracy. A government's failure to respond adequately to a drought does not necessarily imply that citizens should lose faith in democracy as a system—after all, they could simply blame their leaders. What, then, explains this broader shift in political attitudes?

I explore the possibility that exposure to alternative governance models plays a key role. Specifically, I use development projects funded by China as proxies for exposure to autocratic governance models. The idea is that during crises such as droughts, individuals look beyond their own government and assess how different governance systems deliver public goods. As a placebo test, I use projects funded by the World Bank to proxy exposure to democratic governance. While the World Bank represents a development model rooted in democratic governance, Chinese projects often reflect a more centralized, state-led approach that prioritizes efficiency over democratic processes.

Individuals exposed to a drought and a Chinese project receive two signals. First, they observe how their government, operating within a democratic system, responds to crisis. Second, they see an autocratic system in action—one that may appear more effective in delivering essential services. These signals together may shape individuals' beliefs about democracy.

I hypothesize that individuals who experience both a drought and exposure to Chinese projects will be more likely to shift away from democracy, as the combination of weak democratic governance and visible autocratic efficiency leads them to reconsider their political preferences.

I find that respondents exposed to autocratic systems of governance (China) experience a

decline in their support for democracy ranging from 5.12% to 5.59% following a drought. In contrast, for individuals who are not exposed to such systems, or who are exposed to democratic governance models (World Bank), the relationship between droughts and support for democracy is not observed.

Since development projects are unlikely to be randomly distributed across SSA, and are more likely to target areas with specific characteristics (such as poorer regions), one might be concerned that my results are confounded by other factors. These could include exposure to conflict, or variations in income, wealth, health, or education levels within local populations.

I conduct five main tests to address this concern. First, I examine whether droughts affect support for democracy among respondents who were not exposed to development projects at the time of the interview but will be in the future. I find no evidence supporting this. Areas that receive projects only after experiencing a drought do not show any significant relationship between climate change and support for democracy. Furthermore, if projects are targeted at specific types of areas and certain characteristics of these areas are driving the overall results, the drought index in these areas with future development projects should exhibit significant effects. Therefore, this test rules out local conditions as a potential mechanism.

Second, I employ a doughnut design to further test for potential confounding factors. The idea behind this approach is that if exposure to alternatives to democracy (i.e., official development assistance (ODA)) is independent of some factor x, then this factor cannot be a mechanism, since the relationship between climate change and support for democracy only exists for those exposed to alternatives to democracy. This insight helps rule out a range of possible mechanisms. To test this empirically, I show that development projects correlate with various potential mechanisms, such as employment or income, within a 10km radius of the project. Beyond this distance, however, the presence of the development projects no longer correlates with local conditions. By replicating the main result while excluding individuals living within a 10km radius of a development project, I can assess whether I am conflating these potential mechanisms with exposure to non-democratic systems. I find no evidence supporting this, providing further reassurance that local conditions do not act as confounders.

Third, I demonstrate that the results are not driven by development projects in specific sectors. This provides additional evidence that development projects serve as proxies for exposure

to non-democratic systems of governance, rather than reflecting a particular need among certain individuals that could be driving the observed outcome.

Fourth, I show that droughts impact trust in government and institutions for individuals both exposed and not exposed to development projects. This contrast the pattern for perceived government abilities where I show that droughts only impact the outcome for individuals exposed to autocratic systems of governance. This not only rules out the possibility that trust in government and institutions act as a mechanism in this setting, but reinforces the idea that the two signals individuals are exposed to—drought and autocracy—jointly push people to update about their government's ability and the optimal political system.

Fifth, I provide evidence that rules out propaganda as a confounding mechanism. Specifically, China may advertise their projects through local newspapers, TV programs, or radio broadcasts. I demonstrate that the effect of droughts on support for democracy remains significant for both individuals who consume news regularly and those who do not, with the key source of heterogeneity still being exposure to Chinese projects.

Taken together, this evidence suggests that these Chinese development projects effectively serve as proxies for exposure to an autocratic system of governance and do not conflate other potential mechanisms.

Support for democracy is ultimately an "intermediate" outcome that may manifest in concrete actions, such as voting, participating in peaceful demonstrations, or even engaging in full-blown revolutions. I therefore conclude the paper by providing suggestive evidence on how droughts affect self-reported attendance at demonstrations. I find that droughts increase the likelihood of people reporting having attended demonstrations, but only for those not exposed to Chinese development projects. In other words, exposure to development projects enhances political stability, a finding echoed in Gehring et al. (2022), who show that development projects reduce conflict occurrences and increase stability.

I view these findings as complementary to Acemoglu and Robinson (2001), who suggest that individuals may be more likely to protest in order to advance democracy ("threaten revolution") when the opportunity cost is low, such as during a recession (which can be induced by droughts). The finding that droughts increase participation in demonstrations for individuals not exposed to Chinese projects speaks directly to (a part of) Acemoglu and Robinson (2001). However,

the finding that when individuals are exposed to an alternative (autocratic) political system individuals no longer partake in demonstrations, suggests that when the chain of events in Acemoglu and Robinson (2001) only "holds" when individuals do not lose faith in democracies. This is intuitive as one can imagine individuals only fighting for democratic change if they believe in it, which is not the case when droughts lower the support for democracy.

The paper contributes to various strands of the literature. Most closely, the paper relates to the literature examining determinants of support for democracy. One prominent line of research in this literature demonstrates that support for democracy is shaped by accumulated experiences with democratic systems over time (e.g., Persson and Tabellini, 2009; Fuchs-Schündeln and Schündeln, 2015; Besley and Persson, 2019; Claassen, 2020*b*; Acemoglu et al., 2021; Tabellini and Magistretti, 2022). Another strand examines voters' willingness to undermine democratic principles, often driven by political polarization or policy preferences (Graham and Svolik, 2020; Carey et al., 2022; Grossman et al., 2022; Krishnarajan, 2023; Svolik, 2023; Acemoglu et al., 2024). Additional studies emphasize the influence of religion (Inglehart, 2003; Bloom and Arikan, 2013), the role of ("negative") social remittances (Manacorda et al., 2024), civic education (E. Finkel et al., 2024), and social transmission (Dahlum et al., 2024).[3]

I contribute to this literature in two key ways. First, I introduce climate change as a new determinant of support for democracy. Second, I provide evidence that exposure to non-democratic governance systems plays a crucial role in explaining this relationship. This underscores the importance of looking beyond the "obvious income mechanism."

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, 2010; Cole et al., 2012; Amirapu et al., 2022), though some studies also examine trust in government (e.g., Alfano and Aboyadana, 2020; Balcazar and Kennard, 2022) or even social capital and cultural persistence (e.g., Buggle and Durante, 2021; Giuliano

[3]Another significant body of literature focuses on regime changes. A key hypothesis, the modernization theory, argues that economic development—through higher incomes and education—drives democratization (e.g., Lipset, 1959; Huber et al., 1993; Glaeser et al., 2007) and reduces the likelihood of democratic reversals (e.g., Lipset, 1959; Przeworski and Limongi, 1997). Conversely, some scholars argue that economic downturns can spur democratization (e.g., Haggard and Kaufman, 1995; Acemoglu and Robinson, 2001, 2005). Empirical evidence supports both perspectives. For instance, Barro (1999) finds that higher standards of living are associated with greater levels of democracy, while Brückner and Ciccone (2011) provides evidence that recessions can create "democratic windows of opportunity."

and Nunn, 2021). I contribute to this literature by analyzing a new type of outcome: support for democracy. This is important because (a) democratic norms around the world have been eroding, and (b) electoral data in developing countries can be inaccurate, with beliefs potentially signaling future votes and providing useful information for policymakers. Furthermore, much of this literature, especially in developing countries, suggests that the main mechanism is income or agricultural productivity (Cole et al., 2012; Amirapu et al., 2022). In contrast, my results highlight a different channel that does not operate through income or respondents' broader economic circumstances.

Finally, the paper contributes to the large body of literature analyzing the drivers of political beliefs.[4] Specifically, my paper builds on the strand of this literature that examines how exposure to foreign influences affects political outcomes (e.g., Meyersson et al., 2008). The rise of China as a global power (Yang, 2024) has spurred a growing body of research on the effects of Chinese foreign aid. Scholars have explored the impact of Chinese aid on (i) the behavior of traditional lenders like 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). My contribution to this third literature is twofold. First, I demonstrate that the political characteristics of aid donors, when interacted with climate change, are key determinants of beliefs about democracy in Sub-Saharan Africa, revealing effects of foreign aid that have not yet been explored. Second, by showing that the interaction between climate change and foreign aid reduces support for democracy, I introduce a new negative externality to the list of potential concerns associated with foreign aid. Importantly, I provide evidence that this negative impact on support for democracy among individuals exposed to development projects is not driven by the economic effects of the projects themselves. Rather, the negative externality arises from the presence of a non-democratic governance system, a type of externality that has not been considered in the existing literature.

[4]For an overview of the growing literature on people's understanding of economic policies, see Stantcheva (2023). For an example focusing on climate change policies, see Dechezleprêtre et al. (2022).

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 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 participation in demonstration. Section 6 concludes and offers new avenues for future work.

2 Data

Afrobarometer data. To measure support for democracy across SSA, I use data from the Afrobarometer surveys. These nationally representative surveys, conducted roughly every three years in various African countries, provide extensive information on political preferences, social capital, economic conditions, and other related topics. In each survey wave, interviews are conducted in local languages with a randomly selected sample of either 1,200 or 2,400 individuals per country.

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.[5] I match the locations of individuals to weather grid cells, which are described in more detail below.[6,7]

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

[5]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.

[6]Since the wording of questions in survey round 1 differs substantially from that in other rounds, I exclude that round. In round 2, I lose 797 observations in Senegal as the date of those interviews is not known.

[7]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).

like me, it doesn't matter what kind of government we have." I use this question to code two different versions of the outcome. 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".

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). These shares are conditional on not picking option "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 results of the paper are robust to 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, Figure A2 displays the answers by respondents to the question "what does democracy mean to you?". Two facts are worth highlighting: (i) individuals seem to hold an overwhelmingly positive view of democracy and (ii) respondents overwhelmingly associate democracy with the notion of freedom.

Panel B in 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). Existing work analyzing the support for democracy often relies on these three variables as a proxy for support for democracy (e.g., Acemoglu et al., 2021). While the Afrobarometer is unique in asking directly about support for democracy, Panel B of Table 1 shows the shares of these variables are similar.[8]

[8]Online Appendix B provides further summary statistics and validates the main outcome.

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).[9]

To identify droughts, or drought-like conditions, my main right-hand side variable is the SPEI index, developed by Vicente-Serrano et al. (2010).[10] 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),[11] i.e., the soil's ability to retain water. PTE 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 components and has been found to outperform other indices in predicting crop yields (Vicente-Serrano et al., 2012).[12,13]

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.[14]

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 0.485 (0.800) (see Panel C in Table 1), indicating that my sample period (2002-2015) was both drier and exhibited less variability than the historical period.

[9]Examples of work looking at political outcomes include papers analyzing the effects of tornadoes (e.g., Healy and Malhotra, 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).

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

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

[12]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".

[13]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)).

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

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.

Figure A3 displays the distribution of the drought index across all time periods. As expected, given the mean of 0.485, the mass of the histogram is "shifted to the right." Furthermore, notice that there are few extremely wet or extremely dry observations. This is because I focus on the 12 months SPEI index (indeed, a 1 month SPEI index would have many more extreme values). As such, long-run versions of the index are better suited to "capture climate change," which itself is a long-run shift in a mean of a distribution. For expositional simplicity, I call the 12 months SPEI index "drought index" in this paper.[15]

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 $\text{Support for democracy}_{iegct}$ 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

[15] Online Appendix B validates the drought index.

inclusion of household level controls.[16] Standard errors are clustered at the grid cell level.[17]

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 0.485 (0.800). 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 (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

[16]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, and (d) whether the respondent is aligned with the political party in power. I show, in robustness tests, that none of these variables are bad controls, i.e., they are not affected by the drought index, and that the results are robust to excluding all controls and excluding dummy variables (c) and (d).

[17]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.

that these considerations do not represent concerns in my analysis in robustness checks.

Main results. Column 1 of Table 2 presents the main results, relying on coding 1 of the main outcome. The results show that a one standard deviation increase in the drought index decreases the support for democracy by 1.1 percentage points.[18] The effect is statistically significant at the 5% level. The next part of the table translates this estimate into a percentage effect 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%.

Columns 2—4 of Table 2 display the effects of droughts on three variables relating to the erosion of democracy (see Panel B of Table 1). 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.[19]

An interesting thought experiment connects these results to the descriptives in Figure A2, which shows that individuals overwhelmingly associate democracy with freedom. Taken to the extreme, the desire for more consolidation of power within a country's politics results in a loss of freedoms (e.g., if a country abolishes elections, there is no more freedom to vote). It might thus be 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.

Other political beliefs. Table 3 displays results for the effects of droughts on three other political beliefs: trust in government (Column 1), trust in institutions (Column 2), and capabilities of the government (Column 3). I observe that one drought significantly reduces trust in government by 0.118SD, trust in institutions by 0.138SD, and the perceived abilities of the

[18]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 percentage points. For simplicity, I will refer to this simply as a decrease in the support for democracy throughout the paper.

[19]These results also show that individuals are consistent in their answers. Column 1 of the table shows that droughts reduce individuals' support for democracy. The answers in Columns 2—4 show that respondents understand what this decrease in democracy means.

government by 0.068SD.[20]

The fact that droughts reduce individuals' perceived abilities of the government—which I view as a proxy for perceived (local) state capacity—speaks to the idea that droughts can serve as a signal to citizens. On the one hand, the drought can "uncover" information about the government's underlying true ability by "highlighting" how the government reacts to the negative shock. On the other hand, if individuals associate droughts with climate change more broadly, the drought informs individuals about their government's handling of climate change.

Democracy vs. autocracy. Table 4 examines heterogeneous effects by extending equation (1) to include an interaction term between the drought index and a dummy variable, as well as the variable itself. In Column 1, the dummy variable indicates whether the respondent resides in an autocratic country.[21] For the dummy variable in Column 2, I first calculate the lagged share of respondents within a region who perceive their country to either not be a democracy or a democracy with problems and then create a dummy indicating whether that share is above the median. Columns 1 and 2 reveal the same pattern: the negative effect of droughts on support for democracy is confined to (perceived) democracies. In (perceived) autocratic countries, droughts show no significant impact on support for democracy.

3.1 Robustness of Main Results

Online Appendix C presents details of various robustness tests of the main result from Table 2. 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

[20]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.

[21]This variable is derived from the polity measure (see Table B3) and is coded as one if a country consistently has a polity score of 0 or less across all survey years. The result is robust to other codings of this variable.

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 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

This section examines the factors contributing to the observed reduction in support for democracy. It is a priori not obvious why an individual would be less supportive of democracy as a political system only because their government is failing to respond adequately to a drought.

I explore the possibility that exposure to alternative governance models plays a key role. Specifically, I use development projects funded by China as proxies for exposure to autocratic governance models. The idea is that during crises such as droughts, individuals look beyond their own government and assess how different governance systems deliver public goods. As a placebo test, I use projects funded by the World Bank to proxy exposure to democratic governance. While the World Bank represents a development model rooted in democratic governance, Chinese projects often reflect a more centralized, state-led approach that prioritizes efficiency over democratic processes.

Individuals exposed to a drought and a Chinese project receive two signals. First, they observe how their government, operating within a democratic system, responds to crisis. Second, they see an autocratic system in action—one that may appear more effective in delivering essential services. These signals together may shape individuals' beliefs about democracy.

I hypothesize that individuals who experience both a drought and exposure to Chinese projects will be more likely to shift away from democracy, as the combination of weak democratic

governance and visible autocratic efficiency leads them to reconsider their political preferences.[22]

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 A1 summarizes views respondents in the Afrobarometer hold on China and the World Bank.[23]

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 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.

While I don't know what the regimes are that individuals see in China or the World Bank, I assume that these are autocratic and democratic ones, respectively. This implies that for individuals exposed to development projects by China, I should observe droughts to negatively

[22]The decision to focus on this channel is informed by a growing, though inconclusive, body of literature examining the relationship between foreign aid and political attitudes. For instance, Bai et al. (2022) find that Chinese infrastructure aid significantly boosts positive perceptions of the government in the regions where the aid is implemented. Similarly, while Eichenauer et al. (2021) and Blair et al. (2022) find no evidence that exposure to Chinese development projects in Latin America and Africa improves attitudes toward China, respectively, Wellner et al. (2022) demonstrate that such exposure can enhance support for China. Most relevant to this study, Freytag et al. (2024) show that exposure to Chinese development aid in Latin America is linked to an increase in democratic values. A related strand of literature explores the connection between Chinese development aid and democratic backsliding in recipient countries (Bader, 2015; Li, 2017; Hess and Aidoo, 2019; Gamso, 2019).

[23]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.

impact the support for democracy. However, for individuals exposed to World Bank projects, there should be no impact.[24]

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).[25] 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.[26]

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 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).[27] 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).

[24] In reality, the World Bank is technocratic. The crucial question is whether individuals perceive it as such or not. Given the United States' important role in the organization, it seems entirely possible that it is viewed as a democratic institution. More research is needed to understand how individuals view the World Bank.

[25] 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. For comparability with Chinese projects, I discard projects with a start date prior to 2000.

[26] 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.

[27] 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. The dataset contains projects implemented between 2000 and 2015.

Table A2 summarizes project exposure in my dataset. Relying on the 50km (100km) radius for Chinese projects shows that 21.3% and 12.8% (33.8% and 18.3%) of individuals are in groups G_{active} and $G_{inactive}$, respectively. Similarly, relying on the 50km (100km) radius for World Bank projects shows that 58.6% and 11.6% (70.1% and 9.70%) of individuals are in groups G_{active} and $G_{inactive}$, respectively. Panel C of the table shows that there is significant overlap between the project locations of World Bank and Chinese projects.

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 A3 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.[28] The table shows no correlation for Chinese projects and a small negative correlation for World Bank projects.

For Chinese projects this implies that areas subject to disasters are not actively targeted.[29] 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 signal of democratic governance, this should not be of concern.

[28] 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.

[29] 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.

4.4 The Exposure to Autocracy and 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.

Results. Table 5 displays the main results. Columns 1 and 2 (3—6) 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 table contains three important insights. First, the drought index has no significant negative effect on the support for democracy for respondents not exposed to a development project. Second, for individuals exposed to Chinese development projects (i.e., individuals exposed to autocracy), two things stand out: (a) the differential effect of the index for exposed

and not exposed individuals is a highly statistically significant 2.2 percentage points and (b) droughts reduce the support for democracy for these individuals by 2.2 to 2.4 percentage points (5.12 to 5.59%). Third, for individuals exposed to World Bank projects (i.e., individuals exposed to democracy), there is no significant impact of droughts on the support for democracy.[30]

The results in Table 5 suggest that the impacts of droughts on the support for democracy are fully driven by exposure to autocratic regimes. In other words, the signal stemming from the drought uncovering information about the government's true underlying ability is "not enough" to shift citizens' beliefs about the political system. Only once individuals are exposed to a second signal—one informing them about an autocratic system's ability to effectively provide public goods—do people update their beliefs about democracy. The fact that exposure to World Bank projects—which proxy democratic governance—does not exhibit the same pattern further reinforces this idea.

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 conflate other mechanisms. The aim here is to mitigate this concern.[31]

Anticipation effects. To test for anticipation effects, I estimate the following model

$$\begin{aligned}\text{Support for democracy}_{iegct} = \delta_{cy} + \tau_r + \beta_0 \text{Drought Index}_{gct} \\ + \beta_1(\text{Drought Index}_{gct} \times \text{G}^{x\text{km}}_{\text{inactive},iegct}) + \beta_2(\text{Drought Index}_{gct} \times \text{G}^{x\text{km}}_{\text{active},iegct}) \\ + \beta_3 \text{G}^{x\text{km}}_{\text{inactive},iegct} + \beta_4 \text{G}^{x\text{km}}_{\text{active},iegct} + \mathbf{x}_{iegct}\gamma + \epsilon_{iegct} \quad (3)\end{aligned}$$

β_1 in (3) 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 6 presents the results. The interaction between the drought index and inactive devel-

[30] Columns 1—4 rely on the full sample. Given the large overlap in locations of World Bank and Chinese projects, Columns 5 and 6 therefore exclude all locations with Chinese projects.

[31] I focus only on Chinese projects as the main mechanism—a signal of autocratic effectiveness—is only captured by exposure to Chinese projects.

opment 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 7 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), 30km (conditional on not living within 20km), 40km (conditional on not living within 30km), and 40km (conditional on not living within 30km) of a development project funded by 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 5 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 8 does exactly that, i.e., it replicates Table 5 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.

Employment is not the only possible confounder that threatens the result in Table 5. 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. In other words, the regression in Table 8 simultaneously takes into account multiple confounders.

Sectors of ODA. Table 9 asks whether the results in Table 5 are driven by Chinese 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) "transport" as "transport projects", and (d) "energy generation and supply" as "energy" projects, no sector in particular seems to be driving the results displayed above.[32] This is further evidence that the development projects here do indeed act as proxies for exposure to non-democratic systems of governance and are not targeting a particular need of people which may be driving the result.

Revisiting other political beliefs. Table 10 revisits the political beliefs studied in Table 3, i.e., trust in government, trust in institutions, and (perceived) abilities of the government.

Column 3 of the table shows that the impacts on perceived government ability follows the same pattern as the impacts on support for democracy, while Columns 1 and 2 show that droughts affect trust in government and institutions for individuals exposed and not exposed to Chinese projects. This not only rules out the possibility that trust in government and institutions act as a mechanism in this setting, but reinforces the idea that the two signals individuals are exposed to—drought and autocracy—jointly push people to update about their government's ability and the optimal political system.

Propaganda. Table A4 provides evidence that rules out propaganda as a confounding mechanism. Specifically, China may advertise their projects through local newspapers, TV programs,

[32]The radius of exposure in these regressions is 75km, i.e., the average between 50km and 100km.

or radio broadcasts. The table demonstrates that the effect of droughts on support for democracy remains significant for both individuals who consume news regularly and those who do not, with the key source of heterogeneity still being exposure to Chinese projects. Thus, Chinese propaganda is not an underlying mechanism.

Other radii. Table A5 shows that the main result from Table 5 remains unchanged when changing the radius of exposure to 20km and 30km.[33]

5 Tangible Outcomes

Support for democracy is ultimately an "intermediate" outcome that may manifest in concrete actions, such as voting, participating in peaceful demonstrations, or even engaging in full-blown revolutions. Given the positive correlation between support for democracy and a country's level of democracy (Figure A1), understanding how these tangible outcomes are affected is important.

The behavioral outcome I study is self-reported attendance at demonstrations. As Table 11 shows, droughts increase the likelihood of people reporting having attended demonstrations, but only for those not exposed to Chinese development projects. In other words, exposure to development projects enhances political stability, a finding echoed in Gehring et al. (2022), who show that development projects reduce conflict occurrences and increase stability.[34]

Participation in demonstrations is a fundamental right of any democracy. Thinking back to Figure A2, which shows that individuals overwhelmingly associate democracy with freedom, the results here therefore suggest that it is possible that people deliberately give up fundamental political rights (such as attending demonstrations) in exchange for more stability.

I view these findings as complementary to Acemoglu and Robinson (2001), who suggest that individuals may be more likely to protest in order to advance democracy ("threaten revolution") when the opportunity cost is low, such as during a recession (which can be induced by droughts). The finding from Table 11 that droughts increase participation in demonstrations for individuals not exposed to Chinese projects speaks directly to (a part of) Acemoglu and Robinson (2001).

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

[34]However, they contradict the findings of Iacoella et al. (2021) and Sardoschau and Jarotschkin (2024), who argue that the presence of Chinese development aid increases the occurrence of protests and conflict incidents.

However, the finding that when individuals are exposed to an alternative (autocratic) political system individuals no longer partake in demonstrations, suggests that when the chain of events in Acemoglu and Robinson (2001) only "holds" when individuals do not lose faith in democracies. This is intuitive as one can imagine individuals only fighting for democratic change if they believe in it, which is not the case when droughts lower the support for democracy.

6 Conclusion

To the best of my knowledge, this paper is the first to comprehensively analyze the relationship between individuals' support for democracy and climate change. The primary finding is that droughts reduce support for democracy, with exposure to non-democratic (autocratic) systems of governance playing a crucial role in shaping this relationship.

The paper opens up numerous avenues for future research. Together, these directions offer an exciting and policy-relevant research agenda.

First, there is a need for more detailed data on individuals' beliefs and preferences regarding climate change and their connection to various political outcomes in developing countries. In particular, the process by which individuals update their views on climate change and politics remains largely unexplored in this paper.[35] A related gap in this paper is the need to understand what alternative systems of governance individuals may consider, especially in light of the observed decline in support for democracy.

Second, the findings in this paper suggest that the relationship between support for democracy and climate change cannot be easily explained by existing models or straightforward "income mechanisms." This opens up opportunities for theoretical contributions on how individuals form beliefs about democracy. Complementary data collection in the field could further enhance these theoretical developments.

Third, while I have provided suggestive evidence on the link between support for democracy and involvement in demonstrations, further research is needed to examine this relationship and other tangible outcomes more comprehensively.

[35]While there is some research on how individuals update their beliefs about climate change in developed countries (e.g., Deryugina, 2013), much more is needed in the context of developing countries. There is also work on attitudes toward climate change (e.g., Dechezleprêtre et al., 2022).

Finally, this paper has focused exclusively on developing countries. However, climate change and the decline of democratic norms are also significant policy issues in developed countries, making it important to explore this relationship in those contexts as well.

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8 Tables and Figures

Table 1: Summary Statistics

	(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. 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)
C. Drought Index				
Drought index	0.485	0.487	0.663	0.265
	(0.800)	(0.765)	(0.712)	(0.901)
Observations	128988	61208	37870	29910

Notes: The table displays mean sample characteristics and standard deviations (in parentheses) for the main outcome and regressor of interest. 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 the share of respondents who don't support (i) one party rule, (ii) army rule, and (iii) one man rule. Panel C summarizes 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. 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: Extreme Weather Events and the Support for Democracy

	Respondent supports democracy	Respondent doesn't support one party rule	army rule	one man rule
	(1)	(2)	(3)	(4)
Drought index	-0.011**	-0.022***	0.001	-0.011*
	(0.005)	(0.006)	(0.005)	(0.006)
Mean of outcome	0.859	0.741	0.798	0.833
Effect of one drought (2 SDs)	-2.56%	-5.94%	0.25%	-2.64%
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	63890	76487	75951	75466

Notes: The table displays OLS regressions of various dummy variables on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household controls, all of which are described in 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. The outcome in Column 1 is a dummy variable indicating support for democracy (vs. other systems of government), while the outcomes in Columns 2—4 are dummies indicating whether a respondent doesn't support one party rule (Column 2), one army rule (Column 3), and one man rule (Column 4).

Table 3: Comparison to Other Political Beliefs

	Trust in government	Trust in institutions	Capabilities of government
	(1)	(2)	(3)
Drought index	-0.059***	-0.069***	-0.034**
	(0.012)	(0.011)	(0.014)
Mean of outcome	0.000	0.000	0.000
Effect of one drought (2 SDs)	-0.118SD	-0.138SD	-0.068SD
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	77182	77087	77149

Notes: The table displays OLS regressions of three indices of political beliefs on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household controls, all of which are described in 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. The outcome variables are indices of underlying dummy variables constructed by (a) averaging the dummy variables in each category and (b) standardizing this measure. The trust in government index contains dummies indicating the share of respondents who trust (a) the president, (b) parliament, and (c) local government. The trust in institutions index contains dummies indicating the shares of individuals who trust (a) the police, (b) the courts, or (c) the army. The capabilities of government index contains dummies 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.

Table 4: Democracy vs. Autocracy

	Respondent supports democracy	
	(1)	(2)
Drought index	-0.012**	-0.010*
	(0.005)	(0.006)
Drought index x country is autocratic	0.011	
	(0.013)	
Drought index x perceives country as autocratic		0.008
		(0.009)
Coefficient of index + interaction	-0.002	-0.002
p-value: Coefficient of index + interaction	[0.890]	[0.766]
Mean of outcome	0.859	
Effect of one drought (2 SDs) (no interaction)	-2.79%	-2.33%
Effect of one drought (2 SDs) (interaction)	-0.47%	-0.47%
Household controls	Yes	Yes
Cell fixed effects	Yes	Yes
Month by year fixed effects	Yes	Yes
SEs clustered at cell level	Yes	Yes
Observations	63890	51300

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 two dummy variables, said dummy variables themselves, as well as a variety of household controls, all of which are described in 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. The dummy variable in Column 1 indicates whether the respondent lives in an autocratic country. For the dummy variable in Column 2, I first calculate the lagged share of respondents within a region who perceive their country to either not be a democracy or a democracy with problems and then create a dummy indicating whether that share is above the median.

Table 5: The Exposure to Autocracy and Democracy

	Respondent supports democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Drought index	-0.002	0.000	-0.001	0.000	0.000	-0.001
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
Drought index x Chinese project (50km)	-0.022***					
	(0.007)					
Drought index x Chinese project (100km)		-0.022***				
		(0.007)				
Drought index x World Bank project (50km)			-0.007			
			(0.007)			
Drought index x World Bank project (100km)				-0.008		
				(0.007)		
Drought index x World Bank project (50km)					-0.004	
					(0.007)	
Drought index x World Bank project (100km)						0.003
						(0.008)
Coefficient of exposure to project	-0.024	-0.022	-0.009	-0.008	-0.004	0.003
p-value: Coefficient of exposure to project	[0.002]	[0.001]	[0.113]	[0.112]	[0.563]	[0.675]
Mean of outcome			0.859			
Effect of one drought (2 SDs) (no project exposure)	-0.47%	0.00%	-0.23%	0.00%	0.00%	-0.23%
Effect of one drought (2 SDs) (project exposure)	-5.59%	-5.12%	-2.10%	-1.86%	-0.93%	-0.70%
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	64023	64023	64023	64023	49815	40882

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 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 country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 6: Local Conditions do not act as Confounding Mechanisms

	Respondent supports democracy	
	(1)	(2)
Drought index	-0.001	0.002
	(0.004)	(0.005)
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)
Coefficient of inactive exposure to project	-0.010	-0.007
p-value: Coefficient of inactive exposure to project	[0.408]	[0.533]
Coefficient of active exposure to project	-0.024	-0.022
p-value: Coefficient of active exposure to project	[0.002]	[0.001]
Mean of outcome	0.859	
Effect of one drought (2 SDs) (no project exposure)	-0.23%	0.47%
Effect of one drought (2 SDs) (inactive project exposure)	-2.33%	-1.63%
Effect of one drought (2 SDs) (active project exposure)	-5.59%	-5.12%
Household controls	Yes	Yes
Country by year effects	Yes	Yes
Region fixed effects	Yes	Yes
SEs clustered at cell level	Yes	Yes
Observations	64023	64023

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 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 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 country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 7: Local Employment Correlates with Development Projects

	Respondent is employed				
	(1)	(2)	(3)	(4)	(5)
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)		
Chinese project: 40km | not 30km				-0.016	
				(0.013)	
Chinese project: 50km | not 40km					-0.006
					(0.014)
Mean of outcome			0.345		
Household controls	No	No	No	No	No
Country by year effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes	Yes	Yes
Observations	128446	117480	112171	108364	104560

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, 30km, 40km, or 50km of a Chinese project. Columns 2—5 are conditional on not living within a radius of 10km, 20km, 30km, or 40km of a project. Regressions include country × year and region fixed effects and cluster standard errors at the grid cell level.

Table 8: Excluding Income as a Mechanism

	Respondent supports democracy	
	(1)	(2)
Drought index	-0.001	0.001
	(0.005)	(0.005)
Drought index x Chinese project (50km)	-0.027***	
	(0.009)	
Drought index x Chinese project (100km)		-0.024***
		(0.008)
Coefficient of exposure to project	-0.029	-0.023
p-value: Coefficient of exposure to project	[0.002]	[0.001]
Mean of outcome	0.859	
Effect of one drought (2 SDs) (no project exposure)	-0.23%	0.23%
Effect of one drought (2 SDs) (project exposure)	-6.75%	-5.36%
Household controls	Yes	Yes
Country by year effects	Yes	Yes
Region fixed effects	Yes	Yes
SEs clustered at cell level	Yes	Yes
Observations	58976	58976

Notes: The table replicates Columns 1 and 2 of Table 5, but drops individuals living within 10km of a Chinese project.

Table 9: Exposure to Different Sectors of Development Projects

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.003	-0.002	-0.004	-0.005
	(0.005)	(0.005)	(0.005)	(0.005)
Drought index x gov./infrastructure project	-0.020*			
	(0.011)			
Drought index x health/education project		-0.023***		
		(0.009)		
Drought index x transport project			-0.031**	
			(0.014)	
Drought index x energy project				-0.023*
				(0.014)
Coefficient of exposure to project	-0.023	-0.025	-0.035	-0.028
p-value: Coefficient of exposure to project	[0.033]	[0.004]	[0.010]	[0.043]
Mean of outcome		0.859		
Effect of one drought (2 SDs) (no project exposure)	-0.70%	-0.47%	-0.93%	-1.16%
Effect of one drought (2 SDs) (project exposure)	-5.36%	-5.82%	-8.15%	-6.52%
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	64023	64023	64023	64023

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 Chinese development projects, said dummy itself, as well as a variety of household characteristics, all of which are described in the main text. The sectors of development projects are: (i) "government and civil society" and "other social infrastructure", (ii) "health" and "education", (iii) "transport", 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 10: Revisiting Other Political Beliefs

	Trust in government	Trust in institutions	Capabilities of government
	(1)	(2)	(3)
Drought index	-0.025**	-0.031***	0.001
	(0.010)	(0.010)	(0.012)
Drought index x Chinese project (50km)	-0.046**	-0.002	-0.062***
	(0.020)	(0.020)	(0.019)
Coefficient of exposure to project	-0.071	-0.032	-0.060
p-value: Coefficient of exposure to project	[0.000]	[0.117]	[0.005]
Mean of outcome	0.000	0.000	0.000
Effect of one drought (2 SDs) (no project exposure)	-0.05SD	-0.062SD	0.002SD
Effect of one drought (2 SDs) (project exposure)	-0.142SD	-0.064SD	-0.120SD
Household controls	Yes	Yes	Yes
Country by year effects	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
SEs clustered at cell level	Yes	Yes	Yes
Observations	77254	77158	77220

Notes: The table replicates Columns 1 and 2 of Table 5, but changes the outcome to be trust in government (Columns 1), trust in institutions (Column 2), and capabilities of government (Columns 3) (see Table 3).

Table 11: Support for Democracy and Political Engagement

	Attended demonstrations	
	(1)	(2)
Drought index	0.010**	0.009**
	(0.004)	(0.004)
Drought index x Chinese project (50km)	-0.005	
	(0.008)	
Drought index x Chinese project (100km)		-0.000
		(0.007)
Coefficient of exposure to project	0.005	0.009
p-value: Coefficient of exposure to project	[0.548]	[0.166]
Mean of outcome	0.118	
Effect of one drought (2 SDs) (no project exposure)	16.95%	15.25%
Effect of one drought (2 SDs) (project exposure)	8.47%	15.25%
Household controls	Yes	Yes
Country by year effects	Yes	Yes
Region fixed effects	Yes	Yes
SEs clustered at cell level	Yes	Yes
Observations	76543	76543

Notes: The table replicates Columns 1 and 2 of Table 5, but changes the outcome to a dummy variable indicating whether the respondent attended a demonstration in the past 12 months.

A Appendix Tables and Figures

Table A1: 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 A2: Exposure to Development Projects, Summary Statistics

	(1) Full Sample	(2) Eastern Africa	(3) Western Africa	(4) Southern Africa
A. Exposure to Chinese Projects				
Chinese project (100km): active	0.338	0.397	0.247	0.347
	(0.473)	(0.489)	(0.431)	(0.476)
Chinese project (50km): active	0.213	0.260	0.173	0.178
	(0.409)	(0.439)	(0.378)	(0.382)
Chinese project (100km): inactive	0.183	0.163	0.216	0.178
	(0.386)	(0.369)	(0.411)	(0.382)
Chinese project (50km): inactive	0.128	0.116	0.156	0.115
	(0.334)	(0.320)	(0.363)	(0.318)
B. Exposure to World Bank Projects				
World Bank project (100km): active	0.701	0.765	0.893	0.355
	(0.458)	(0.424)	(0.310)	(0.479)
World Bank project (50km): active	0.586	0.626	0.774	0.286
	(0.493)	(0.484)	(0.418)	(0.452)
World Bank project (100km): inactive	0.097	0.069	0.100	0.142
	(0.296)	(0.253)	(0.300)	(0.349)
World Bank project (50km): inactive	0.116	0.097	0.155	0.103
	(0.321)	(0.297)	(0.362)	(0.304)
C. Geographical Overlap				
Active Chinese and World Bank projects (100km)	0.297	0.357	0.246	0.253
	(0.457)	(0.479)	(0.431)	(0.435)
Active Chinese and World Bank projects (50km)	0.179	0.226	0.172	0.104
	(0.383)	(0.418)	(0.378)	(0.306)
Observations	128988	61208	37870	29910

Notes: The table displays mean and standard deviations (in parentheses) of dummy variables indicating exposure to active and inactive Chinese and World Bank development projects. Active development projects are projects that are, at the time of the interview, either ongoing or recently finished, whereas inactive development projects are projects that, at the time of the interview, have not yet started (see main text). Panels A and B summarize the shares for Chinese and World Bank projects, respectively. Panel C summarizes the geographical overlap of these projects. 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 A3: 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	-0.015*	0.009
	(0.009)	(0.008)	(0.009)	(0.008)
Mean of outcome	0.128	0.183	0.116	0.097
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 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 country $\times$ year and region fixed effects and cluster standard errors at the grid cell level.

Table A4: Excluding Propaganda as a Mechanism

	Respondent supports democracy	
	(1)	(2)
Drought index	-0.002	0.005
	(0.007)	(0.007)
SPEI (12 months) x Chinese project (50km)	-0.042***	
	(0.015)	
SPEI (12 months) x consumes news	-0.000	
	(0.006)	
SPEI (12 months) x Chinese project (50km) x consumes news	0.022	
	(0.015)	
SPEI (12 months) x Chinese project (100km)		-0.051***
		(0.015)
SPEI (12 months) x consumes news		-0.006
		(0.007)
SPEI (12 months) x Chinese project (100km) x consumes news		0.033**
		(0.014)
Coefficient of exposure to project & no-news	-0.044	-0.046
p-value: Coefficient of exposure to project & no-news	[0.002]	[0.001]
Coefficient of exposure to no project & news	-0.002	-0.001
p-value: Coefficient of exposure to no project & news	[0.665]	[0.859]
Coefficient of exposure to project & news	-0.022	-0.057
p-value: Coefficient of exposure to project & news	[0.008]	[0.004]
Mean of outcome	0.859	
Household controls	Yes	Yes
Country by year effects	Yes	Yes
Region fixed effects	Yes	Yes
SEs clustered at cell level	Yes	Yes
Observations	63993	63993

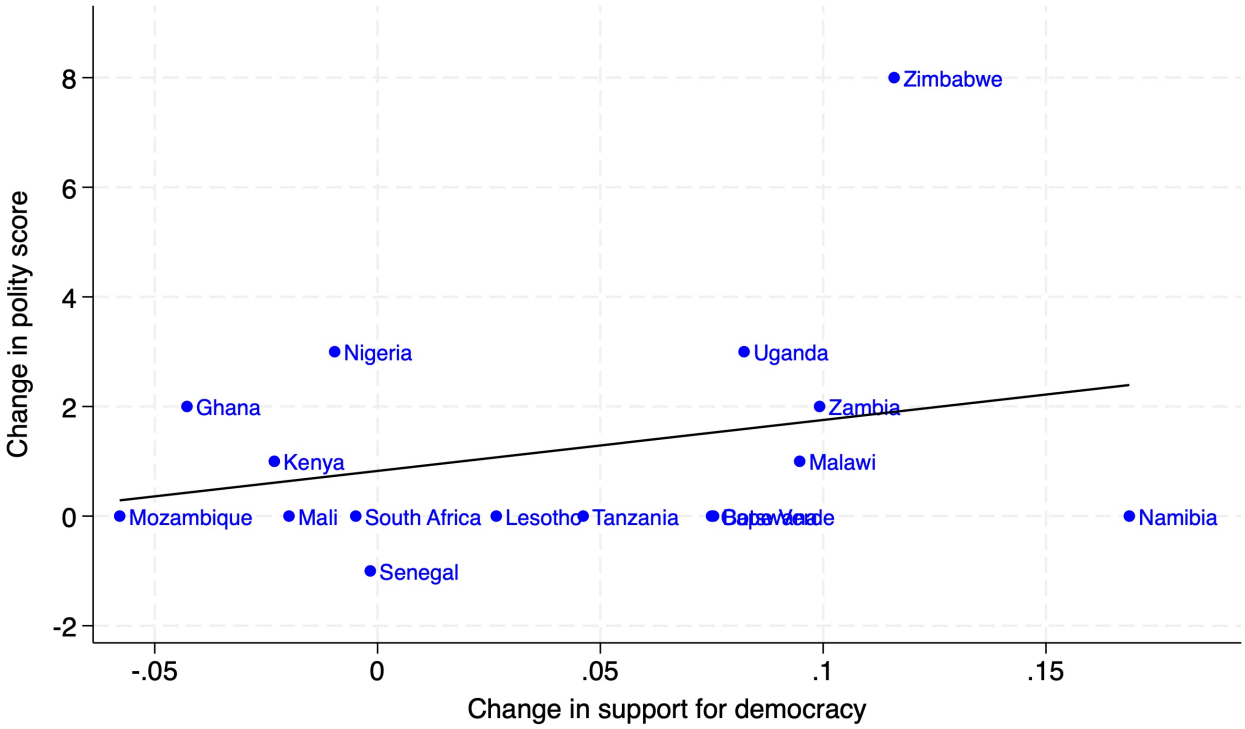
Notes: The table displays OLS regressions of a dummy variable indicating support for democracy (vs. other systems of government) on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI), an interaction of the SPEI index with a dummy variable indicating whether the respondent lives within a radius of 50km or 100km of a Chinese project, said dummy itself, an interaction of the SPEI index with a dummy variable indicating whether the respondent regularly consumes news (TV, radio, or newspapers), said dummy itself, an interaction of project expose and news consumption, a triple interaction, as well as a variety of household characteristics, all of which are described in 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 country × year and region fixed effects and cluster standard errors at the grid cell level.

Table A5: Robustness of Results to Different Radii

	Respondent supports democracy	
	(1)	(2)
Drought index	-0.004	-0.003
	(0.005)	(0.005)
Drought index x Chinese project (20km)	-0.021**	
	(0.009)	
Drought index x Chinese project (30km)		-0.019**
		(0.008)
Coefficient of exposure to project	-0.025	-0.022
p-value: Coefficient of exposure to project	[0.009]	[0.011]
Mean of outcome	0.859	
Effect of one drought (2 SDs) (no project exposure)	-0.93%	-0.70%
Effect of one drought (2 SDs) (project exposure)	-5.82%	-5.12%
Household controls	Yes	Yes
Country by year effects	Yes	Yes
Region fixed effects	Yes	Yes
SEs clustered at cell level	Yes	Yes
Observations	64023	64023

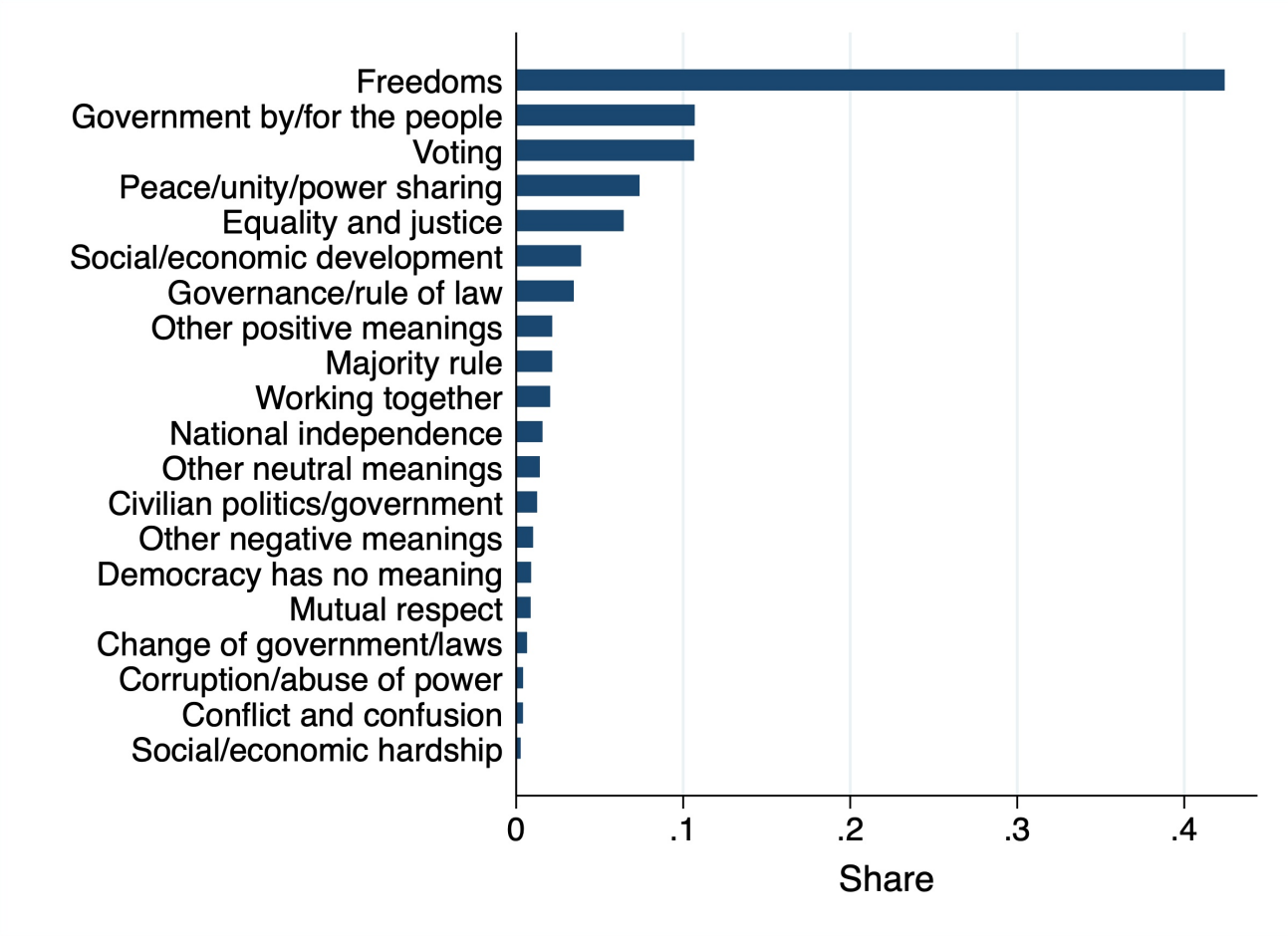
Notes: The table replicates Columns 1 and 2 of Table 5, but changes the radius of exposure to Chinese development projects to 20km and 30km (instead of 50km and 100km).

Figure A1: Long-run Changes in Polity Score and Support for Democracy



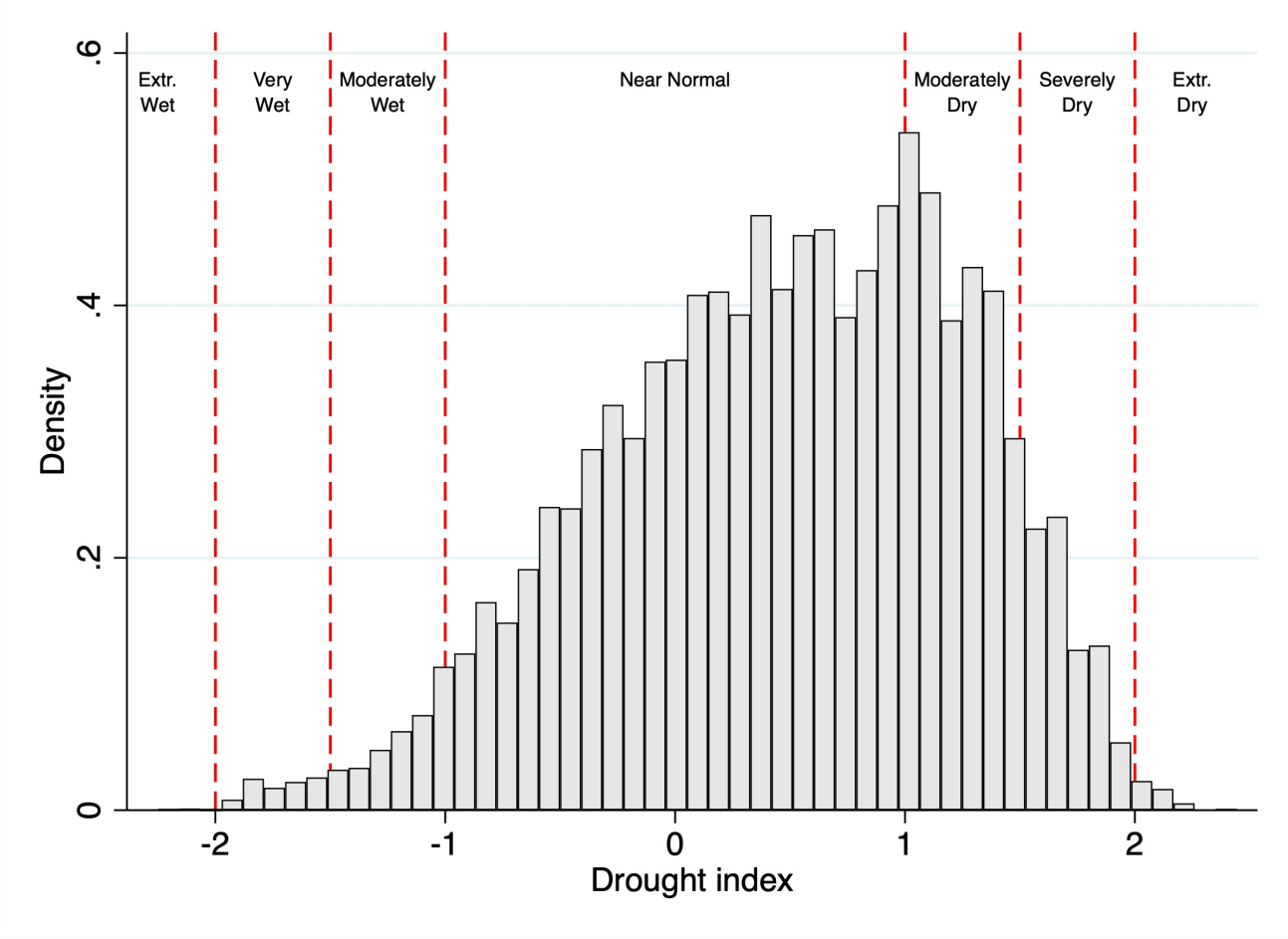
Notes: The figure displays a scatter plot and a fitted regression line of the change in the country-level polity score and the change in the country-level support for democracy. The change is calculated as the difference between the first (2002 or 2003) and last (2014 or 2015) year a country appears in the data.

Figure A2: The Meaning of Democracy



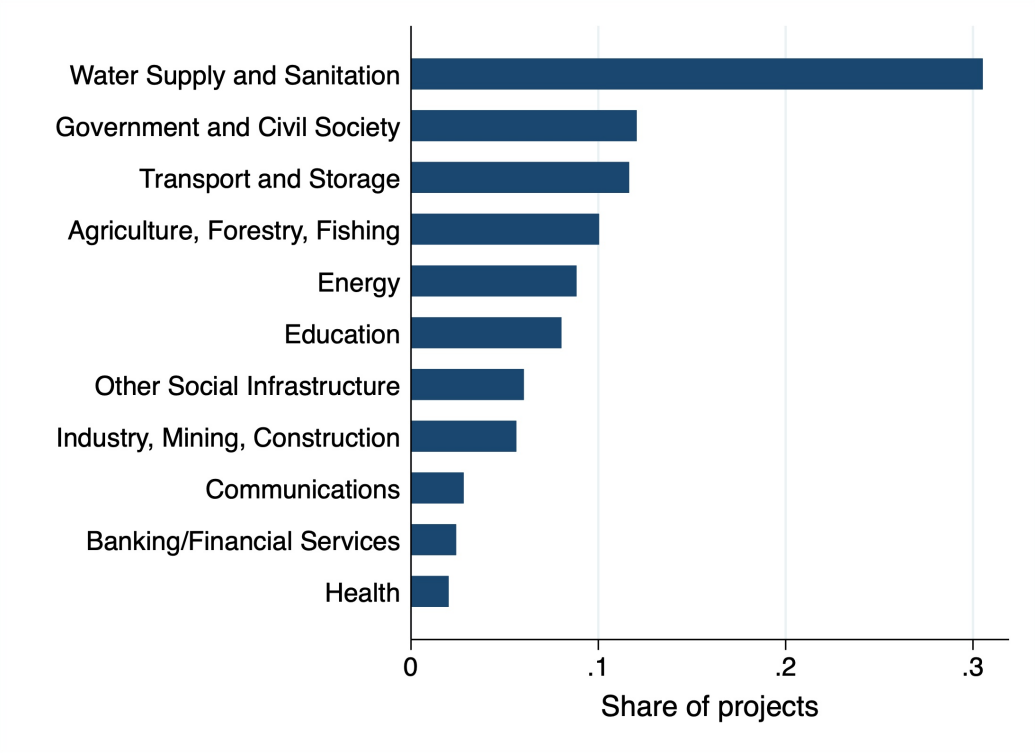
Notes: The figure displays the answers by respondents to the question "what does democracy mean to you?". The question was only asked in survey rounds 3 and 6.

Figure A3: Distribution of the Drought Index

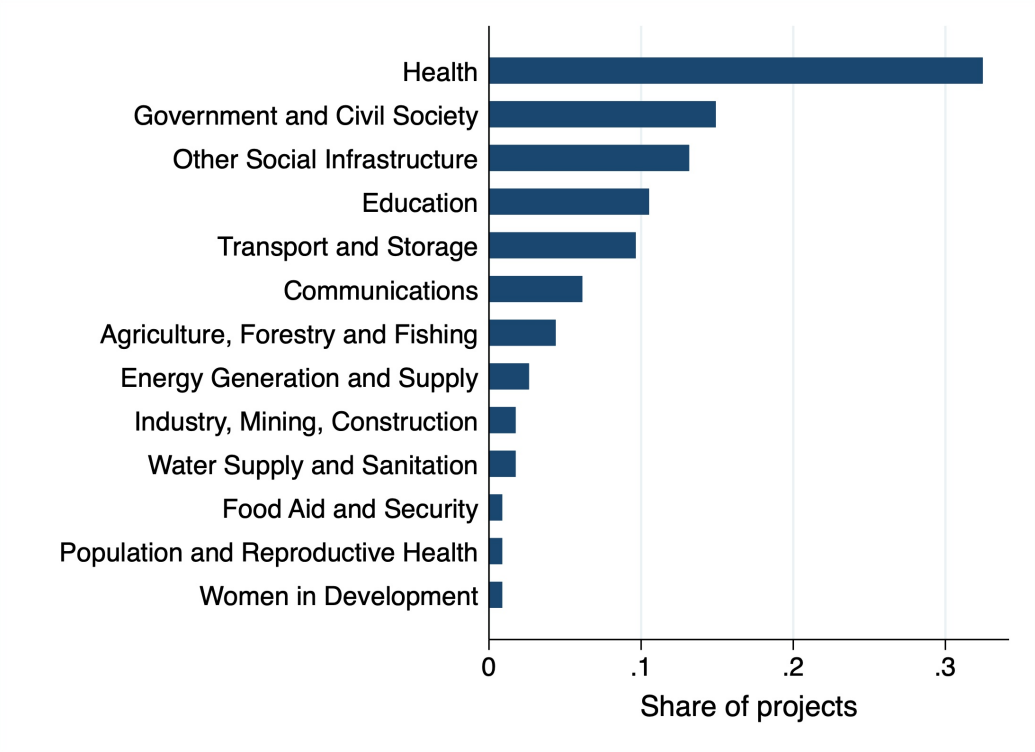


Notes: The figure displays the distribution of the 12 months Standardized Precipitation Evapotranspiration Index (SPEI). The SPEI index is a standardized drought index, where negative values indicate wet weather conditions and positive values indicate drought-like conditions. A drought corresponds to a shock of approximately two standard deviations. Vertical lines correspond thresholds within the drought index.

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, excluding any water and sanitation, environmental, and emergency projects.

B Data Appendix (Online)

Afrobarometer data: additional information. Panels A, B, C and D of Table B1 provide further summary statistics for various political variables. Panels A, B, and C display 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. Panel D 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 A, B, and C, 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 B1, I create a variable ranging from 1 to 4, where 1 indicates "not a democracy" and 4 indicates "full democracy."

To validate the responses in the survey, Table B2 presents OLS regressions of coding 1 of my main outcome variable on different 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 B3 provides further validation of the responses in the Afrobarometer. The table regresses various answers from the Afrobarometer on the polity score.[36] 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 B1) to show that people who live in a more democratic country view their country as more democratic. The outcome in Column 3 (4) [5] is an index created from variables in Panel A of Table B1 (Panel C of Table B1) [Panel B of Table B1], as described above. As can be seen, individuals living in

[36]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).

more democratic countries display higher trust in government and institutions, and view their government as more capable. The directions of the significant correlations found in Columns 2—5 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 surprising. The outcome I study is distinct from other, more standard, political outcomes studied, 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 in the short-run.

Weather data: additional information. There is a large literature documenting negative economic impacts of weather variations (e.g., Dell et al., 2014; Carleton and Hsiang, 2016). Table B4 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.[37] 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.[38] 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.[39] As expected, droughts increase the probability that a respondent's grid cell is exposed to a battle/conflict event. Overall, Table B4 validates the drought index used in this paper.[40]

[37]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".

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

[39]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. The variable used in this table is the "battle" dummy: it indicates having experienced a conflict classified as a battle of any kind (regardless whether control of geographies changes).

[40]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.

Table B1: Summary Statistics of Political Beliefs

	(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. 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 B2: 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)
Mean of outcome					0.859				
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. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table B3: Correlates Political Preferences and Polity Measurement

	Respondent supports democracy	How democratic is country?	Trust in government	Trust in institutions	Capabilities of government
	(1)	(2)	(3)	(4)	(5)
Polity score	0.000	0.079***	0.067***	0.033***	0.053***
	(0.003)	(0.009)	(0.009)	(0.008)	(0.009)
Mean of outcome	0.859	2.766	0.000	0.000	0.000
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	102935	114925	126715	126759	127050

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) three indices measuring trust in government, trust in institutions, and the capabilities of the government. 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. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

Table B4: Validation of Drought Index

	Economic expectations	Food availability	Cash availability	Log(nightlights)	Conflict
	(1)	(2)	(3)	(4)	(5)
Drought index	-0.037***	-0.065***	-0.061***		
	(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	52446	77747	77561	59313	77888

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 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. 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 conflict. Regressions include grid cell and month by year fixed effects and cluster standard errors at the grid cell level.

C Robustness Tests (Online)

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.[41,42]

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

[41] 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.

[42] 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.[43]

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 C1 displays the final results of the procedure. The table shows that the main results from Table 2 are unchanged and therefore robust.

Sample selection. Sample selection 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 C2 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 was hit by a (extreme) disaster (and a full set of unit and time fixed effects). With the exception

[43] 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 2.

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.[44]

Balancedness of interviewees. Table C3 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 C4 regresses the household characteristics on the continuous measure of the drought index and finds no correlation, confirming that the variables do not act as bad controls.

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 C5 reproduces Column 1 of Table 2 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 and lags. Table C6 zooms in on Column 1 of Table 2 and makes the following adjustments. For Columns 1 and 2 the outcome is the same as the one used in the main results. However, Columns 3 and 4 rely on coding 2 of the main outcome (see main text). Additionally, Columns 1 and 3 add a 12 month lead of the drought index and Columns 2 and 4 add the same lead plus two lags. The main results do not change. This rules out pre-trends.

Other drought measurements. Table C7 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 2 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,

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

similar in magnitude as the main effect in Column 1 of Table 2. This suggests that the impact of a drought shock on respondents' support for democracy is lagged by roughly half a year.

Six other robustness checks. Table C8 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. My main specification is robust to all these alternative specifications.

Table C1: Heterogeneous Treatment Effects (Wooldridge, 2021)

	Respondent supports democracy	Respondent doesn't support one party rule	army rule	one man rule
	(1)	(2)	(3)	(4)
Drought index	-0.019**	-0.012**	-0.004	-0.008
	(0.005)	(0.006)	(0.006)	(0.005)
Mean of outcome	0.859	0.741	0.798	0.833
Effect of one drought (2 SDs)	-4.42%	-3.24%	-1.00%	-1.92%
Household controls	Yes	Yes	Yes	Yes
Cell fixed effects	Yes	Yes	Yes	Yes
Month by year fixed effects	Yes	Yes	Yes	Yes
Bootstrapped SEs	Yes	Yes	Yes	Yes
Observations	63890	76487	75951	75466

Notes: The table displays robustness checks to the main results in Table 2, following the procedure described in Wooldridge (2021). The coefficients displayed stem from OLS regressions of various dummy variables on the 12 months Standardized Precipitation Evapotranspiration Index (SPEI) as well as a variety of household controls, all of which are described in 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. The outcome in Column 1 is a dummy variable indicating support for democracy (vs. other systems of government), while the outcomes in Columns 2—4 are dummies indicating whether a respondent doesn't support one party rule (Column 2), one army rule (Column 3), and one man rule (Column 4). Step 1 of the procedure consists of country level regressions in the same spirit as the ones run in Table 2. Step 2 of the procedure aggregates these individual effects by taking a simple average. The standard errors are bootstrapped in step 2.

Table C2: 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 C3: 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: The 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 $\times$ survey wave fixed effects and cluster standard errors at the region $\times$ survey wave level.

Table C4: Sample Selection: Further Balance of Household Characteristics

	Age	Educated	Male	White	Politically aligned
	(1)	(2)	(3)	(4)	(5)
Drought index	-0.152	0.001	0.000	-0.001	-0.001
	(0.117)	(0.004)	(0.001)	(0.001)	(0.007)
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	127300	128684	128985	121307	86163

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 C5: Sample Selection: International Migration

	Respondent supports democracy			
	(1)	(2)	(3)	(4)
Drought index	-0.011**	-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)	-2.56%	-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	58886	55235	50082	47509

Notes: The table replicates Column 1 of Table 2 but, one by one, drops the countries in my sample with the highest number of emigrants (Uganda, Zimbabwe, Tanzania, Senegal).

Table C6: Robustness of Main Result to Inclusion of Leads and Lags

	Respondent supports democracy			
	Coding 1		Coding 2	
	(1)	(2)	(3)	(4)
Lead of drought index (1 year)	0.003	0.004	-0.002	-0.003
	(0.004)	(0.004)	(0.005)	(0.005)
Drought index	-0.015***	-0.015***	-0.026***	-0.025***
	(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)		0.002		-0.006
		(0.004)		(0.005)
Mean of outcome	0.859		0.682	
Lead effect of one drought (2 SDs)	0.70%	0.93%	-0.59%	-0.88%
Effect of one drought (2 SDs)	-3.49%	-3.49%	-7.62%	-7.33%
Lagged effect of one drought (2 SDs)		0.23%		-2.93%
Lagged effect of one drought (2 SDs)		0.47%		-1.76%
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	58078	58078	70449	70449

Notes: Columns 1 and 2 replicate Column 1 of Table 2, but add a one year lead and two year lag of the drought index to every regression. Columns 3 and 4 repeat the procedure but exchange the outcome to a second, complementary, measure of support for democracy.

Table C7: Robustness to Different Drought Measures

	Respondent supports democracy		
	(1)	(2)	(3)
Drought dummy	-0.093**	-0.091**	
	(0.046)	(0.045)	
Lagged drought dummy (1 year)		0.036	
		(0.028)	
Lagged drought dummy (2 years)		0.004	
		(0.015)	
3 Months drought index			-0.001
			(0.004)
Lagged drought index (3-6 months)			0.007
			(0.005)
Lagged drought index (6-9 months)			-0.009**
			(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	63890	63890	63890

Notes: The table replicates Column 1 of Table 2, 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 C8: Further Robustness Tests

	Respondent supports democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Drought index	-0.010**	-0.009**	-0.010**	-0.010**	-0.008*	-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%	-1.86%	-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	64026	63264	102935	101768	63121	59405

Notes: The table replicates Column 1 of Table 2 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 the main text.