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Money down the drain: Corruption and water service quality in Africa

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Abstract

Using data from the seventh round of the Afrobarometer, we find that a greater regional incidence of corruption in the utilities sector is associated with a reduced likelihood that a household reports that it has access to enough clean water. This result is not evident in older rounds of the survey that were conducted prior to methodological improvements made in round seven. Moreover, this association holds only in areas with a piped water system. Thus, our findings are consistent with the argument that corruption is a barrier to accessing water through its impact on the quality of water services. While a household that has paid a bribe is more likely to have a water access point, the regional incidence of utilities corruption predicts that the household will not have enough clean water. Individual acts of bribery, while associated with connection to a water network, are not associated with greater access in reality.

1 | INTRODUCTION

The World Health Organization estimate that more than 785 million people lack even a basic drinking-water service. Corruption, the abuse of public power for private gain, is at least partially responsible for this outcome. Prior studies suggest that it is a grave threat to millions of people around the world, as corruption in the water and sanitation sector enables the spread of water-borne diseases and contributes to thousands of illnesses and deaths every year (Duflo et al., 2012; Holmberg & Rothstein, 2011). The source of the problem is well understood: typically, the market for water is a monopoly and political authority is fragmented and lacks accountability. Water infrastructure in this context is a prime target for corrupt officials because investment is typically large, upfront, and controlled by a handful of individuals. Such conditions are a breeding ground for corruption and unsurprisingly many studies have documented a wide range of corrupt practices, from bribery to obtain connections to grand corruption at the highest levels of government (Butterworth & De La Harpe, 2009; Davis, 2004; Gonzalez de Asis et al., 2009; Tetreault & McCulligh, 2018).

Despite evidence of widespread corruption, the impact of corrupt practices on ordinary citizens is less well understood. In particular, we do not know if corruption helps or hinders access to basic water services. On the one hand, bribery might help some citizens in the context of weak governance, at least those that can afford it. Corruption might also enable private providers to circumvent red tape and regulations, allowing them to serve more customers (Cummins & Gillanders, 2020). On the other hand, while seen as necessary to obtain water services, corruption may lower the quality of water services. Previous studies find that corruption is associated with low quality public services (Berkovich, 2016; Habibov, 2016; Nguyen et al., 2017) and poor infrastructure (Gillanders, 2014; Kenny, 2009; Tanzi & Davoodi, 1998). In more corrupt places, therefore, bribery might secure a connection to an unreliable water network, degraded by endemic corruption in the regional utilities sector.

In this article, we test the conjecture that corruption in the regional utilities sector lowers water service quality using household data from the Afrobarometer a series of public attitude surveys. Our focus is on the seventh round, conducted in 34 African countries in 2016–2018. This round introduced important methodological improvements, namely computer-assisted data collection. The surveys ask citizens if they have ever gone without water and also asks them to recount their experiences of corruption and bribery. Importantly, the surveys ask citizens about corruption in different contexts, including the utilities sector. Drawing on their responses, we calculate the proportion of citizens in the region who had to pay a bribe to access utilities and use this measure as a proxy for corruption in the regional utilities' sector. We find that the regional incidence of utilities corruption is a strong predictor of water service quality. The more common is regional corruption, the less likely a household is to have access to water. This association holds only in areas with a piped water system, and is not affected by corruption in other contexts outside of the utilities sector. Individual acts of bribery are not associated with greater access for the household. In fact, bribery is not a statistically significant predictor of access to water even if one omits the regional incidence of corruption from the model.

Why then do people pay bribes? To address this closely related question, we examine how corruption influences the location of water access points. We find that people who pay a bribe have more convenient access to a nominal water source. However, while they may get something tangible for their bribes, they do not get something reliable: corruption in their region reduces the effectiveness of their water access point, such that even if it is inside their house, they may not have enough clean water. These findings offer a nuanced picture of how corruption in utilities is a barrier to accessing water in Africa, showing that while individual acts of bribery might help with physical connectivity, the corrosive nature of corruption in the local utilities sector undermines any advantage that might be gained.

That said, our findings are subject to limitations, and we do not make causal claims. In particular, our main finding is inconsistent with results obtained using earlier rounds of the Afrobarometer survey. These earlier rounds were conducted prior to the improvements in the survey methodology implemented in Round 7. We discuss some potential reasons for this inconsistency in our methodology section, and in our conclusion we make suggestions. Future work using additional rounds of data collected under the revised protocols may be able to exploit spatial and temporal variation to explore the complex causal relationships between corruption, the provision of fixed water infrastructure, and the quality of service.

The remainder of this paper is organized as follows. First, we review the wider empirical literature on corruption and water. Then, we focus specifically on the mechanisms through which corruption may degrade water service quality. Finally, we report our data, method and results and offer concluding remarks and suggestions for reforms.

2 | CORRUPTION AND WATER

2.1 | Corruption in the water and sanitation sector

Transparency International (2008) estimate that somewhere between 10% and 30% of spending in water is lost to corruption. The Khlong Dan scandal, described as the "'mother of all corruption cases' in Thailand" is a vivid illustration of the problem.[1] In 1995, the government of Thailand approved a plan to build one of the largest wastewater plants in the world in the Extended Bangkok Metropolitan Region, processing 525,000 cm^3 of wastewater everyday (Mekong Watch, 2010). Almost 3 decades later, the plant remains shuttered—near completion but not yet commissioned. Work was halted after it was discovered that high ranking government officials and local landowners had conspired to inflate the purchase price of the land required for construction by as much as 1000%, sending construction costs soaring from 13.6 billion baht to 22.9 billion baht (US$ 730.8 million) (Sohn, 2007). Its discovery led to the prosecution and conviction of state officials, including a former deputy minister. Meanwhile, thousands of factories and households continue to discharge untreated or insufficiently treated wastewater, polluting the environment and threatening livelihoods.

Unfortunately, the water and sanitation sector is acutely vulnerable to this type of grand corruption. Water provision is typically a monopoly and political authority over water is often fragmented and lacks accountability. In practice, this means that national water networks often consist of several local monopolies, presided over by multiple and sometimes overlapping water agencies. Prior studies show that these conditions are ripe for corruption and inefficiency. Davis (2004, p. 53) documents the range of corrupt practices on the ground in several locations in South Asia in focus group discussions with more than 1400 staff, customers, and key informants. The findings reveal substantial evidence of bribery and petty corruption, including the falsification of meter readings for lower bills, and bribery to expedite repair work and new connection applications. The most common type, according to Davis, was bribery to falsify meter readings, which occurred in 41% of cases in the previous 6 months.

However, Davis' findings also point to sophisticated arrangements, where funds budgeted for construction are "skimmed" and shared out between contractors and agency staff in complex kickback systems. Davis' results are not based on a random sample but nonetheless underline the seriousness of the problem faced by civic authorities and large swathes of the population in developing countries. Subsequent studies largely support the finding that corruption, waste, and inefficiency are endemic in the water and sanitation sector in developing countries. Auriol and Blanc (2009), for example, demonstrate that water is particularly vulnerable to capture by the ruling elite in sub-Saharan Africa. Asthana (2008) finds a strong association between decentralization and corruption in India.

Scholars have also pointed to a range of historical and developmental concerns regarding water governance and performance. Gandy (2008), for example, emphasizes the historical and postcolonial roots of Mumbai's dysfunctional water infrastructure, arguing that authoritarian forms of political mobilization and the dominance of middle-class interests contributed to poor performance. Marks and Breen (2021) point to rapid growth and industrial development as the main driving force behind corruption in Thailand's wastewater sector. Yet more studies have focused on developing solutions to improve water governance, including greater citizen participation (Carr et al., 2012), attention to incentive structures (Araral & Wang, 2013), and innovative new technologies (Krolikowski, 2014).

2.2 | Corruption and access to water

Despite evidence of widespread corruption, there are few studies on the effect of corruption on access to water. The only large scale quantitative evidence is provided by Anbarci et al. (2009), who study the impact of country level corruption on access to drinking water and sanitation facilities in a sample of 85 countries, observed across four time periods from 1990 to 2004. Their data consists of national aggregates of water access and sanitation from the World Development Indicators and an indicator of corruption based on expert perceptions. They find a strong and negative association between this indicator and the fraction of a country's population with access to water and sanitation. This is good *prima facie* evidence for a connection between corruption and access to water.

Other aspects of good governance also predict access to water. The work of Lee et al. (2014), points to a link between the rule of law (captured by the cost of settling a legal claim) and access to water in a cross-country sample. Jindra and Vaz (2019) similarly show that government effectiveness predicts a multidimensional poverty index that includes access to water as a component. While this relationship is also evident when using the International Country Risk Guide (ICRG) metric of political risk, no significant relationship is found when using Transparency International's Corruption Perceptions Index (CPI).

However, new approaches allow us to shed further light on the topic. Expert perception-based indicators, such as the CPI or the ICRG used by Anbarci et al. (2009), have been criticized for being vulnerable to perception biases (Adhikari et al., 2019; Fan et al., 2009; Reinikka & Svensson, 2006) and for being slow to keep up with new developments (Kenny, 2009; Knack, 2007). In particular, there is a risk that an expert might infer the level of corruption from observable outcomes such as poor provision of infrastructure. Country level measures of corruption perceptions cannot disentangle grand from petty corruption or allow us to examine corruption in particular contexts. Furthermore, the use of the ICRG index as a measure of corruption in general has been criticized. Williams and Siddique (2008) note that the 2000 ICRG ratings found Ireland to be as corrupt as North Korea because the index is based, in part, on how long the governing party has been in power.

Cross-national surveys now collect data on corruption experiences at the household and firm-level. The Afrobarometer, for example, asks respondents about their experience of corruption in several different contexts, including the utilities sector. Survey data at this level of granularity enable us to observe more complex relationships than previous studies, including the relationship between household access to water, the quality of water connections, and household and regional experiences of corruption. As a consequence, we can more closely interrogate the mechanisms linking corruption and access to water, moving beyond national level aggregates to regional intensity in the sectors responsible for service delivery and individual experiences of corruption on the ground.

2.3 | Corruption, investment, and infrastructure

We next consider the mechanisms that can give rise to a negative effect of corruption on access to water. The most obvious is that bribery is costly, and this cost must weigh heavily on poor and vulnerable communities, who must sacrifice scarce resources to meet basic human needs (Justesen & Bjørnskov, 2014). Paying bribes to the police, schools, and so on, can diminish the pool of resources available for a household to spend on water. However, the potential for corruption to harm society goes beyond the impact on household budgets. Several channels can drive an association between corruption and access to water.

First, there is substantial evidence that corruption is bad for economic growth across the world (Aidt et al., 2008; Mauro, 1995) and in sub-Saharan Africa more specifically (Gyimah-Brempong, 2002). In large part this is due to the harmful effect of corruption on both private and public investment (Mauro, 1995; Wei, 2000). Marson and Savin (2015) note that corruption may moderate the effect of capital cost recovery on access to water, though cannot test the idea with their data. In addition, with lower levels of growth, there is less scope and capacity for public or private investment in basic services like water and sanitation. Corruption also undermines the efficiency of public investment (Del Monte & Papagni, 2001). Thus one would expect to observe lower levels of access in more corrupt places.

Second, there is a strong link between corruption and the quality of infrastructure and the built environment. Ambraseys and Bilham (2011), for example, find that from 1990 to 2010, 83% of all deaths from building collapse in earthquakes occurred in highly corrupt countries. Gillanders (2014) finds that corrupt countries tend to have worse transport and electricity infrastructure. Lehne et al. (2018) show that corruption raises the cost of building roads. If the same dynamics prevail in the water sector, then corruption could reduce access by inflating the cost of water projects, draining resources, and delaying upgrading and essential repair work.

Third, corruption is responsible for the misallocation of resources and the distortion of public policy and the overall framework within which decisions are made, at all levels of government and administration (Mauro, 1998). Indeed, a plethora of studies show that corruption is harmful to education, health, and other pro-poor redistributive efforts (Dincer & Gunalp, 2012; Gupta et al., 2002). Taken together, the literature suggests that corruption will lead to underinvestment and inefficiencies in the water sector. In the next section, we consider the specific linkages between corruption and the quality of water services in more detail.

3 | CORRUPTION AND THE QUALITY OF WATER SERVICES

Why should households in a region that is afflicted by corruption have greater difficulty accessing water than households in other regions? The answer, we argue, lies primarily in the impact of corruption on the quality of water services. In the water sector, technical service quality, or what the end-user physically receives from the provider, is essential for daily living. A high quality technical water service is efficient, reliable, and widely available. Access is an important feature of water service quality but it is often unreliable and precarious in developing countries. Moreover, it is likely that corruption affects water service quality. Indeed, previous studies find that corruption distorts the composition of public spending (Mauro, 1998; Tanzi & Davoodi, 1998), the efficiency of local public spending (Del Monte & Papagni, 2001) and the efficiency of the public sector at the regional level (Yan & Oum, 2014). Each of these mechanisms could give rise to a negative effect of corruption on the quality of the local water service.

Batley and Mcloughlin's (2015) approach to the politics of public services offers further insight into why services such as water are particularly vulnerable to corruption, and why we should focus our attention on corruption in the regional utilities sector, before considering corruption in other contexts. In particular, their approach systematizes the characteristics of public services, drawing linkages between these characteristics and the political dynamics that we might observe across different services.

The framework emphasizes different market and task-related characteristics. As we already argued, the market for water typically consists of several local monopolies, governed by multiple and sometimes overlapping water agencies. Such conditions are often associated with lower quality services that one would find in a more competitive market. Consumers have little choice but to deal with a corrupt local provider, and corruption weighs most heavily on the poor, who are more vulnerable to bribery when obtaining services (Justesen & Bjørnskov, 2014; Peiffer & Rose, 2018).

Task characteristics pertain to the specific tasks involved in service delivery. These tasks vary considerably across different types of services, and can have implications for the politics of service delivery. Water services, in particular, are known to have a high technical content, which is usually associated with greater provider autonomy.[2] Such autonomy provides opportunities for corruption. In our case, this might involve water providers using their autonomy to delay vital repairs in order to extract bribes. When the task characteristics of water services are combined with monopolistic market conditions, there is significant potential for corruption among local providers. In a highly corrupt regional utilities sector, a service provider will use its autonomy to focus on extracting bribes over delivering a reliable service. Corruption in this context is not merely a quid pro quo arrangement, where a consumer bribes a provider to gain access to a utility. A service provider in search of bribes will make corrupt choices, from the quality of materials it uses in service delivery to its strategic, operational and policy decisions. Corrupt choices accumulate over-time, hindering the development of the utility and reducing service quality for everyone. For example, a corrupt provider in search of bribes might offer its services to more users than it can reasonably accommodate, while neglecting essential maintenance and repair work. Thus, a single act of bribery may grant an individual access to a water service, but the service they will receive is poor because the provider has reduced the quality of its service for all users. Moreover, users will find it difficult to hold providers accountable—while a community may be able to organize locally to secure water infrastructure, such as pipes or boreholes that serve a distinct area, their political representatives will have greater difficulty monitoring the functionality and quality of water systems (Batley and Mcloughlin's (2015), p. 278). Furthermore, suppliers retain the ability to turn off their supply at intervals, giving them greater leverage over end-users.

Both the market and task-related characteristics of water suggest that we should focus on corruption in the regional utilities sector. But in doing so, we must control for a household's quid pro quo relationship with their service provider, namely their informal payments to access water and indeed the presence or absence of a piped water system. Moreover, it is important to consider the potential impact of corruption in other walks of life outside of the utilities sector. Societies and communities steeped in corruption may experience further difficulties in accessing water in addition to those outlined above. For example, corruption is known to undermine trust and social capital more generally (Banerjee, 2016; Ulsaner, 2004). Without trust and social capital, collective action problems become more difficult to resolve and the transmission of water knowledge, attitudes and good practice is impeded (Bisung & Elliott, 2014). Indeed, Bisung et al. (2014) conclude that improved social capital is a necessary, though not sufficient, condition for improving access to water in marginalized communities in rural Kenya. Evidence from rural Brazil also points to social capital, in this case water user associations, as a powerful force driving access (Barde, 2017). Support for water conservation efforts is also undermined by corruption and perceptions of procedural injustice (Grillos et al., 2021; Sundström, 2016), which can be understood through the lens of the so-called legitimacy effect whereby corruption undermines compliance (Boly et al., 2019). Our emphasis on corruption in the regional utilities sector does not rule out these alternative channels of influence, which we account for in our empirical tests.

4 | DATA AND METHODS

In this section, we describe the data we use to examine the association between corruption and access to water and our statistical approach. Our data come from the seventh round of the Afrobarometer, a series of representative household surveys of socio-economic conditions and political attitudes. The seventh round was conducted in 34 African countries from 2016 to 2018, the most recent at the time of writing. Earlier rounds of the Afrobarometer also asked about utilities corruption and access to water but relied on paper and pencil interviewing. There is some evidence of interviewer error in these rounds (Demarest, 2017). To enhance the reliability of the data, the Afrobarometer (AB) introduced computer-assisted personal interviewing in Round 7. We therefore focus our analysis on the data collected under the reformed methodology. The surveys enable us to test the impact of corruption on access to water because they contain a range of questions on basic human needs and experiences, including access to water and sanitation, and experiences of corruption in several contexts, including personal experiences of bribery and experiences of corruption in the regional utilities' sector.

Our main outcome of interest is household access to water. To measure this, we utilize the following question from the Afrobarometer survey: "*Over the past year, how often, if ever, have you or anyone in your family gone without enough clean water for home use?*" Respondents can answer, "never", "just once or twice", "several times", "many times", or "always." We create a dummy variable, *Access*, which takes a value of one if the respondent indicates that they have at least occasional access to water, that is, if they answer anything other than "always". We also make use of the full range of ordered responses in a robustness exercise.

Table 1 presents summary statistics for all of the variables used in this article. It shows that more than 90% of our sample have at least some access to water according to this criterion. While

TABLE 1 Summary statistics

	N	Mean	Std. Dev.	Min	Max
Access	44,778	0.9073876	0.2898918	0	1
Has paid a bribe for utilities	44,778	0.0335433	0.1800523	0	1
Regional incidence of utility corruption	44,778	0.0334722	0.0422051	0	0.7083333
Regional incidence of other corruption	44,778	0.2157962	0.1315222	0	0.875
Piped water system in the area	44,778	0.5473893	0.4977547	0	1
Poverty index	44,778	4.771182	3.687952	0	16
Urban area	44,778	0.4459779	0.4970786	0	1
Female	44,778	0.5008486	0.5000049	0	1
Homesource	44,546	0.4645984	0.4987507	0	1

this may seem high, it accords with World Health Organization estimates of the global access rate to an improved water source.[3] It also masks substantial heterogeneity within our sample. For example, 27% of respondents in Guinea report always lacking enough clean water compared to less than 1% of respondents in Mauritius. Table A1 in the Appendix presents summary statistics for each country in the sample.

To measure corruption, we use questions that ask the respondent about their experience of paying bribes in several contexts. Of particular relevance to us is the question that asks about their history of paying bribes when trying to secure water, sanitation, or electric services from the government. Specifically, respondents are asked: *"how often, if ever, did you have to pay a bribe, give a gift, or do a favor for a government official in order to get the services you needed?"* From this, we create a dummy variable that takes a value of one if the respondent reports having had to pay a bribe in this context and zero if they had no experience of seeking these services or did but did not have to pay a bribe while doing so. Averaging this variable over the respondent's region, as defined in the survey, gives us a measure of the regional incidence of corruption in the utilities sector. We use the region rather than the primary sampling unit/enumeration area (PSU) as the number of observations in the latter can be very small.[4] Depending on the country, these regions are referred to variously as, for example, States, Administrative Districts, and Provinces. Table 1 shows that around 3.4% of our sample have paid a bribe in this context. The incidence in the average region is very similar though the range is considerable. In some regions, nobody reports paying a bribe in this context while in the worst afflicted region for utilities corruption, over 70% of people report paying bribes to access water, sanitation, or electric services.

As we already mentioned, experience based indicators of corruption have several advantages over the more common expert indicators such as the Corruption Perceptions Index (CPI). First, expert opinions are susceptible to perception biases, where the level of corruption is inferred from an expert's hypothesized consequences of corruption; an expert who may have little or no firsthand experience of corruption and a very different overall life experience (Fan et al., 2009). Second, measures of individual experience allow us to explore outcomes that vary at the individual or household level within a given country. Thus, we can create measures of corruption that allow for the fact that corruption often varies considerably within a given country. Finally, while measures such as the CPI contain only broad aggregates of how corrupt a country is perceived to be, the Afrobarometer asks about corruption in specific circumstances. Therefore, we can more closely interrogate the mechanisms linking corruption and access to water by focusing on corruption in the utilities sector. It is important to note, however, that our utilities corruption variable does not just ask about water services. While the scope is more refined than general corruption perceptions, respondents could answer with reference to electric and sanitation services. We are therefore careful to interpret this as a measure of utilities corruption rather than water corruption.

As our outcome of interest, whether respondent *i* in region *j* has access to water $\left(\text{access}_{ij} = 1\right)$, is binary, we estimate probit models of the following form:

$$\Pr\left(\text{access}_{ij} = 1\right) = \Phi\left(\beta_0 + \beta_1 \text{bribe}_i + \beta_2 \text{regcorr}_j + \beta_3 \text{pipes}_i + \beta_4 \text{poverty}_i + \beta_5 \text{urban}_i + \beta_6 \text{female}_i\right)$$

In, a robustness exercise we make use of the full range of information and estimate an ordered probit model. In both cases, we report marginal effects to facilitate interpretation of the results.

While our main variable of interest is the regional incidence of corruption in the utilities sector $\left(\text{regcorr}_j\right)$, we also include an individual's own experience of corruption (bribe_i) as a control variable. As discussed above, we need to allow for the household's potential *quid pro* *quo* relationship with a service provider. Including both own experience and the regional incidence allows us to separate the direct links between water access and living in a region with high corruption from an important indirect channel of influence.

The surveys enable us to include a proxy for the presence of water infrastructure. We create a dummy variable, $pipes_i$, that takes a value of one if the survey enumerator indicates that there was a *"Piped water system that most houses can access"* in the primary sampling unit/enumeration area in which the respondent lives. Approximately 55% of respondents lived in an area with such a system. We employ this variable in two ways. As we have seen, corruption is detrimental to the provision of infrastructure and a lack of infrastructure limits the scope for access to water, regardless of quality of that access (Winter et al., 2021). To address the potential for omitted variable bias we begin by including the infrastructure variable as a control. We thus look at the association between utilities corruption and a household's quality of access to clean water, conditional on the presence of a piped water system in the area. Note that this enumerator-evaluated indicator of water infrastructure does not tell us if the household has access, only that they believe that there is some fixed infrastructure in the area that most households can access. Hasan and Alam (2020) show that in many African countries, almost half of households do not have access to an improved source of drinking water. We also split our sample by whether the household is in an area judged to possess a piped water system. This will enable us to elaborate on the mechanism driving our results. If utilities corruption only predicts worse access in places with a piped water system, then our results are consistent with corruption undermining the quality of an improved water service provided to an area.

In addition, we include several control variables that are plausibly correlated with both access to water and exposure to corruption. As the poor are more at risk of corruption (Justesen & Bjørnskov, 2014) and having no access to water, we also control for a lived poverty index, $poverty_i$, constructed from questions that ask about shortages of food, medicine, cash, and cooking oil. Furthermore, we include a dummy variable for urban areas, $urban_i$, and for the gender of the respondent, $female_i$, as these factors are plausibly correlated with exposure to corruption and corruption risk and attitudes, and to demand for or access to water. For example, Brinkerhoff et al. (2018) show that distance from an urban center is a predictor of access to government services and Bisung and Elliott (2018) find that female headed households in Kenya scored lower on a water insecurity metric than male headed households. Finally, we include country fixed effects to allow for time invariant cross-country heterogeneity and cluster our standard errors at the level of the survey area.

Given the complex relationships between corruption and the provision and quality of infrastructure, and our reliance on cross sectional data, we do not make causal claims for our estimates. With a strong theoretical basis and careful use of the data, however, we argue that our analysis is useful in terms of both policy and advancing the research frontier for an important question.

5 | RESULTS/DISCUSSION

Table 2 presents our main results. We begin in Column 1 by including the respondent's own experience of paying bribes. Somewhat surprisingly, this variable is statistically insignificant, though we must remember that there are plausible countervailing mechanisms at play - the tendency for bribes to be paid by those who lack and require access and the tendency for bribes to facilitate access. Our control variables are statistically significant and accord with what one might

TABLE 2 Corruption and access to water

	(1) Access	(2) Access	(3) Access	(4) Access	(5) Access	(6) Access	(7) Access
Has paid a bribe for utilities	−0.01		−0.00			−0.01	0.00
	(0.007)		(0.006)			(0.016)	(0.004)
Regional incidence of utility corruption		−0.15**	−0.16**		−0.13*	−0.12	−0.14***
		(0.073)	(0.073)		(0.073)	(0.158)	(0.045)
Regional incidence of other corruption				−0.04	−0.02		
				(0.037)	(0.036)		
Piped water system in the area	0.04***	0.05***	0.05***	0.04***	0.05***		
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)		
Poverty index	−0.01***	−0.01***	−0.01***	−0.01***	−0.01***	−0.02***	−0.01***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Urban area	0.02***	0.02***	0.02***	0.02***	0.02***	0.03***	0.02***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.008)	(0.004)
Female	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.00
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)
Country dummies	YES	YES	YES	YES	YES	YES	YES
Pseudo R-Squared	0.1844	0.1850	0.1853	0.1845	0.1850	0.1456	0.1934
Sample	Full	Full	Full	Full	Full	No pipes	Pipes
Observations	44,778	44,887	44,778	44,887	44,887	20,267	24,511

Note: Main entries are marginal effects obtained from Probit models. Standard errors are clustered by region and reported in parentheses.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

expect. The presence of a piped water system increases the likelihood that the household will have access, though only by 4%. While the magnitude may seem small, one must recall that many households rely on unimproved sources (Hasan & Alam, 2020). Poorer households are less likely to have access while those in urban areas are 2% more likely to have access. Finally, women are more likely to have access. These findings are consistent throughout the other models in Table 2.

In Column 2, we introduce the regional incidence of utilities corruption. This enters with a statistically significant and negative marginal effect. Those living in a region with more corruption in utilities are less likely to have access to water. When we include individual bribery experience in Column 3, this does not change our conclusion. The magnitude of the association between the incidence of utilities corruption and water access is meaningful but not implausible. A household in the most corrupt area in our sample is 10% less likely to report that they have access to enough clean drinking water relative to one in the "cleanest" area. This would represent a very large change in the share of households reporting utilities corruption—from zero to 70%. A more modest change of, say, one standard deviation, would translate into a 0.5% drop in the likelihood that a household reports having access to enough clean water. Given that the marginal effect of being in an urban location is 2% and the range of the corruption variable is so large, we conclude that utilities corruption is a meaningful barrier to water access for households in Africa on average.[5]

As we can see in Figure A1 in the Appendix, there is variation in the sign, size, and significance, of the estimated relationship between utilities corruption and access to water when we

TABLE 3 Ordered probit model for access to water

In the past year, how often have you, or someone in your family, gone without enough clean water for home use?	Never	Just once or twice	Several times	Many times	Always
Has paid a bribe for utilities	−0.0257*	0.0017**	0.0080**	0.0091*	0.0069*
	(0.0129)	(0.0007)	(0.0039)	(0.0047)	(0.0037)
Regional incidence of utility corruption	−0.4272**	0.0324**	0.1360**	0.1493**	0.1095**
	(0.1860)	(0.0145)	(0.0590)	(0.0653)	(0.0481)
Piped water system in the area	0.1152***	−0.0081***	−0.0361***	−0.0405***	−0.0305***
	(0.0118)	(0.0011)	(0.0037)	(0.0043)	(0.0035)
Poverty index	−0.0622***	0.0048***	0.0198***	0.0217***	0.0159***
	(0.0013)	(0.0005)	(0.0008)	(0.0007)	(0.0006)
Urban area	0.0384***	−0.0030***	−0.0123***	−0.0134**	−0.0098***
	(0.0109)	(0.0009)	(0.0035)	(0.0038)	(0.0028)
Female	0.0187***	−0.0014***	−0.0059***	−0.0065***	−0.0048***
	(0.0040)	−0.0003	(0.0013)	(0.0014)	(0.0011)

Note: Main entries are marginal effects obtained from an ordered Probit model which includes country fixed effects. $N = 44{,}778$. Standard errors are clustered by region and reported in parentheses.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

estimate our model on data from each country separately. This suggests that geography, climate, institutions, and indeed policy may all play a role in shaping this relationship. Future work could usefully investigate the factors that moderate the role played by corruption.

To better understand the mechanism driving our result, we created a variable capturing the incidence of corruption in other situations, namely seeking medical attention, documents, school placements, and help from and avoiding trouble with the police. From Table 1 we can see that the average region has an incidence rate of approximately 22% for these types of corruption. When we include this alternative measure in Column 4 of Table 2, we can see that non-utilities corruption does not significantly predict access to water. Including both metrics of regional corruption in Column 5, we can see that utilities corruption is still statistically significant, albeit at 10%; though, the strong correlation between the two variables, ($r = 0.61$) can explain this change. We therefore conclude that corruption in utilities is a barrier to water, rather than the general level of corruption.

The final columns of Table 2 split the sample by whether or not the survey enumerator reported that there was a piped water system in the area that most households could access. Utilities corruption on the part of public officials is most likely to influence household access to water in settings where people are dependent on improved water sources rather than the unimproved sources such as surface water, unprotected wells and springs, trucks and tankers that are still very common in sub-Saharan Africa (Hasan & Alam, 2020). As can be seen in columns 6 and 7 of Table 2, utilities corruption is only associated with access to water in areas with a piped water system. This is consistent with the idea that a corrupt utilities sector delivers a lower quality service, and thus imposes significant welfare costs on the population.

As a robustness check, Table 3 presents the results of an ordered probit model that utilizes the full range of information available in the question on water access. In line with the results from the simple binary probit model, an increase in the regional incidence of utilities corruption is associated with lower quality of water access. Our findings are thus robust to using the full scope of the information available.[6] As a further robust check, we estimated mixed effects models with random intercepts and random slopes for the individual experience of paying bribes in the context of utilities. The results, reported in Table A2 in the Appendix, support our conclusion that the regional incidence of utilities corruption is a significant predictor of household access.

As a further test of our core results, we estimated our model using data from rounds five and six. Table A3 presents the results. No significant association is evident in the data from Round 5 and a positive association is found in Round 6. Pooling the data for all three rounds also yields an overall positive relationship between the incidence of corruption in services and access to water. While the results from these rounds are at variance with our findings from Round 7, in the Appendix we present evidence consistent with sampling bias in the earlier rounds and discuss this issue further. The potential for sampling error is discussed in Demarest (2017) who finds evidence for some degree of interviewer error in earlier rounds. To help combat this issue, Round 7 introduced computer-assisted personal interviewing. Demarest notes that *"Switching to Computer Assisted Personal Interviewing (CAPI) can reduce mistakes during the interview (and data input) process, but can also allow for the systematic collection of data on interview duration and speed per question, the tracking of interviewer walk patterns via GPS coordinates, as well as the time between interviews* (Demarest, 2017, p. 22)."Logan et al. (2020) also identify CAPI as an important element in collecting high quality data. CAPI helps to ensure that random walk rules are followed, helping to avoid *"biases in the pools of respondents recruited by interviewers*" (Demarest, 2017, p. 22). In the context of studying a metric of deprivation these are potentially significant if enumerators have a tendency to choose better off individuals or neighborhoods that are more salubrious. We thus consider the Round 7 results as the most credible but accept that the results from earlier rounds point to the need for further research on this topic.

5.1 | Do bribe payers have better access to a nominal water source?

As our measure of corruption in utilities captures bribes paid to secure services, a natural question is whether corruption influences the placement of water sources. People who pay a bribe do so in expectation of a return and failing to meet these expectations will see corrupt officials' offers or demands to help for a price rapidly become non-credible. Therefore, one would expect bribe payers to have better access to a nominal water source.

This is exactly what we find in Table 4. In Column 1, we estimate a probit model in which the dependent variable, *Homesource*, takes a value of one if the respondent's main source of water is in the house or the compound and zero if the source is outside the compound. From Table 1, we can see that 46% of our sample had a source inside their house or compound. Column 1 of Table 4 tells us that while the regional incidence of corruption does not influence the location of the main source of water for the respondent, his or her own history of bribery does. Paying a bribe makes it significantly more likely that the source is in the house or the compound. The tendency for those lacking convenient access to pay bribes to improve their situation could make this an underestimate of the true effect. It should be remembered, however, that this bribe variable does not only capture water corruption but bribes paid for other household services such as sanitation and electricity. One possibility, which we cannot fully discount despite controlling for the household's lived poverty index, is that those who have paid a bribe for electricity are also more likely to have a water source in their home. The remaining columns of Table 4 report the results of an ordered probit model and confirm this finding, though this model is dependent on

TABLE 4 Corruption and the location of water infrastructure

	(1) Home source	(2) Inside house	(3) Inside compound	(4) Outside compound
Has paid a bribe for utilities	0.06***	0.0253***	0.0186***	−0.0439***
	(0.018)	(0.0095)	(0.0062)	(0.0156)
Regional incidence of utility corruption	−0.26	−0.1095	−0.0915	0.2011
	(0.202)	(0.0991)	(0.0830)	(0.1820)
Piped water system in the area	0.27***	0.1453***	0.1240***	−0.2693***
	(0.015)	(0.0089)	(0.0082)	(0.0147)
Poverty index	−0.02***	−0.0131***	−0.0110***	0.0241***
	(0.001)	(0.0008)	(0.0007)	(0.0013)
Urban area	0.26***	0.1495***	0.1095***	−0.2590***
	(0.016)	(0.0100)	(0.0071)	(0.0144)
Female	−0.01**	−0.0037*	−0.0031*	0.006*
	(0.005)	(0.0022)	(0.0019)	(0.0040)
Observations	44,546	44,546	44,546	44,546

Note: Column 1 reports marginal effects obtained from a probit model. Columns 2, 3, and 4 report marginal effects obtained from an ordered probit model. Both models include country fixed effects. Standard errors are clustered by region and reported in parentheses.

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

the assumption that a source inside one's own house is better than one in the compound, which in turn is better than outside the compound.

Combined our findings offer a nuanced picture of how corruption in utilities shapes access to water for households in Africa. Individual acts of bribery may result in more convenient water sources for a household, but the corrosive nature of corruption on the quality of the service means that the pipes are more likely to run dry.

6 | CONCLUSIONS

Our research adds to the body of work that shows how corruption is a serious threat to sustainable development. Using the seventh round of the Afrobarometer, we find that corruption in utilities strongly predicts whether a household will have access to enough clean water for everyday use. By contrast, we do not find that corruption in other contexts predicts access to water. While bribery may help a household to obtain a water access point, high levels of corruption mean that it is unlikely to be a reliable source of water.

The seventh round of the Afrobarometer introduced methodological improvements to address the issue of sampling bias, adding to the credibility of our findings. Nevertheless, our research has some limitations. More specifically, our findings are not consistent with older Afrobarometer data. Further research is needed to establish whether this is a due to sampling bias in the older rounds, which were collected prior to the reforms introduced in the seventh round. As future Afrobarometer data are released, further tests leveraging spatial and temporal variation in both corruption and infrastructure can be conducted to establish the robustness of our conclusions, their generalizability, and the factors that moderate the relationship.

If we are to protect vulnerable communities, basic services like water and sanitation must be increasingly insulated from corruption. Our findings suggest that the problem is concentrated largely in the utilities sector, and that particular problem locations can be targeted using local and regional corruption indicators. What precise actions to take and how to address the deep causes of water system dysfunction is more complex, and requires deep reform in governance and public policy. To address the challenge, some sub-Saharan African countries have appointed independent water regulators at the national level, but significant variability and fragmented governance is still the norm (Eberhard, 2019, p. 63). Davis (2004) notes that where corruption in the water sector has been reduced, it involved shifts in the accountability of service providers, changes in the work environment, and increases in the moral cost of misconduct. Scholars of water governance have also suggested that greater citizen participation (Carr et al., 2012) and more attention to incentive structures (Araral & Wang, 2013), among many other proposed solutions.

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DATA AVAILABILITY STATEMENT

This paper uses data from the Afrobarometer which are publicly available at https://www.afrobarometer.org/data/.

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ENDNOTES

[1] This scandal is described in greater detail in Marks and Breen (2021) and Sohn (2007).

[2] Batley and Larbi (2004) suggest this is achieved through the strength of their organization and expertise, via professional groups, organized labor, and contractors.

[3] See for example, https://www.who.int/news-room/fact-sheets/detail/drinking-water.

[4] If we estimate our model using the incidence of corruption at the PSU level, it is significantly and negatively associated with access to water. However, if we include the regional incidence of corruption, the PSU incidence is no longer significant. See Appendix, Table A4.

[5] In Table A5, we construct the regional incidence of corruption for each individual excluding his or her own experience. Our findings in terms of the significance and magnitude of regional corruption do not change, but own experience of paying a bribe is significantly associated with an increased likelihood of having access.

[6] Table A6 shows that if we include those who have gone without water "many times" in the group that go without water "always" regional corruption remains significant and has a much larger estimated magnitude.

REFERENCES

Adhikari, T., Breen, M., & Gillanders, R. (2019). Are new states more corrupt? Expert opinions versus firms' experiences. *Applied Economics Letters*, *26*(2), 131–134. https://doi.org/10.1080/13504851.2018.1441500

Aidt, T., Dutta, J., & Sena, V. (2008). Governance regimes, corruption and growth: Theory and evidence. *Journal of Comparative Economics*, *36*(2), 195–220. https://doi.org/10.1016/j.jce.2007.11.004

Ambraseys, N., & Bilham, R. (2011). Corruption kills. *Nature*, *469*(7329), 153–155.

Anbarci, N., Escaleras, M., & Register, C. A. (2009). The ill effects of public sector corruption in the water and sanitation sector. *Land Economics*, *85*(2), 363–377. https://doi.org/10.3368/le.85.2.363

Araral, E., & Wang, Y. (2013). Water governance 2.0: A review and second generation research agenda. *Water Resources Management*, *27*(11), 3945–3957. https://doi.org/10.1007/s11269-013-0389-x

Asthana, A. N. (2008). Decentralisation and corruption: Evidence from drinking water sector. *Public Administration and Development: The International Journal of Management Research and Practice*, *28*(3), 181–189. https://doi.org/10.1002/pad.496

Auriol, E., & Blanc, A. (2009). Capture and corruption in public utilities: The cases of water and electricity in Sub-Saharan Africa. *Utilities Policy, Corruption and Infrastructure Services*, *17*(2), 203–216. https://doi.org/10.1016/j.jup.2008.07.005

Banerjee, R. (2016). Corruption, norm violation and decay in social capital. *Journal of Public Economics*, *137*, 14–27. https://doi.org/10.1016/j.jpubeco.2016.03.007

Barde, J. A. (2017). What determines access to piped water in rural areas? Evidence from small-scale supply systems in rural Brazil. *World Development*, *95*, 88–110. https://doi.org/10.1016/j.worlddev.2017.02.012

Batley, R., & Mcloughlin, C. (2015). The politics of public services: A service characteristics approach. *World Development*, *74*, 275–285. https://doi.org/10.1016/j.worlddev.2015.05.018

Batley, R. A., & Larbi, G. (2004). *The changing role of government—the reform of public services in developing countries*. Palgrave, Macmillan.

Berkovich, I. (2016). The corrupted industry and the "wagon-wheel effect" A cross-country exploration of the effect of government corruption on public service effectiveness. *Administration & Society*, *48*(5), 559–579. https://doi.org/10.1177/0095399715607287

Bisung, E., & Elliott, S. J. (2014). Toward a social capital based framework for understanding the water-health nexus. *Social Science & Medicine*, *108*, 194–200. https://doi.org/10.1016/j.socscimed.2014.01.042

Bisung, E., & Elliott, S. J. (2018). Improvement in access to safe water, household water insecurity, and time savings: A cross-sectional retrospective study in Kenya. *Social Science & Medicine*, *200*, 1–8. https://doi.org/10.1016/j.socscimed.2018.01.001

Bisung, E., Elliott, S. J., Schuster-Wallace, C. J., Karanja, D. M., & Bernard, A. (2014). Social capital, collective action and access to water in rural Kenya. *Social Science & Medicine*, *119*, 147–154. https://doi.org/10.1016/j.socscimed.2014.07.060

Boly, A., Gillanders, R., & Miettinen, T. (2019). Deterrence, contagion, and legitimacy in anticorruption policy making: An experimental analysis. *The Journal of Legal Studies*, *48*(2), 275–305. https://doi.org/10.1086/703128

Brinkerhoff, D. W., Wetterberg, A., & Wibbels, E. (2018). Distance, services, and citizen perceptions of the state in rural Africa. *Governance*, *31*(1), 103–124. https://doi.org/10.1111/gove.12271

Butterworth, J., & De La Harpe, J. (2009). *Grand designs: Corruption risks in major water infrastructure projects*. 27. U4 Brief. U4 Anti-Corruption Resource Center.

Carr, G., Blöschl, G., & Loucks, D. P. (2012). Evaluating participation in water resource management: A review. *Water Resources Research*, *48*(11). https://doi.org/10.1029/2011wr011662

Cummins, M., & Gillanders, R. (2020). Greasing the turbines? Corruption and access to electricity in Africa. *Energy Policy*, *137*, 111188. https://doi.org/10.1016/j.enpol.2019.111188

Davis, J. (2004). Corruption in public service delivery: Experience from South Asia's water and sanitation sector. *World Development*, *32*(1), 53–71. https://doi.org/10.1016/j.worlddev.2003.07.003

Del Monte, A., & Papagni, E. (2001). Public expenditure, corruption, and economic growth: The case of Italy. *European Journal of Political Economy*, *17*(1), 1–16. https://doi.org/10.1016/s0176-2680(00)00025-2

Demarest, L. (2017). An assessment of interviewer error in the afrobarometer project. *CRPD Working Paper*, (53).

Dincer, O. C., & Gunalp, B. (2012). Corruption and income inequality in the United States. *Contemporary Economic Policy*, *30*(2), 283–292. https://doi.org/10.1111/j.1465-7287.2011.00262.x

Duflo, E., Galiani, S., & Mobarak, M. (2012). *Improving access to urban services for the poor: Open issues and a framework for a future research agenda*. J-PAL Urban Services Review Paper. Abdul Latif Jameel Poverty Action Lab.

Eberhard, R. (2019). *Access to water and sanitation in Sub-Saharan Africa*. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Fan, C. S., Lin, C., & Treisman, D. (2009). Political decentralization and corruption: Evidence from around the world. *Journal of Public Economics*, *93*(1–2), 14–34. https://doi.org/10.1016/j.jpubeco.2008.09.001

Gandy, M. (2008). Landscapes of disaster: Water, modernity, and urban fragmentation in Mumbai. *Environment & Planning A*, *40*(1), 108–130. https://doi.org/10.1068/a3994

Gillanders, R. (2014). Corruption and infrastructure at the country and regional level. *Journal of Development Studies*, *50*(6), 803–819. https://doi.org/10.1080/00220388.2013.858126

Gonzalez de Asis, M., O'Leary, D., Per, L., & John, B. (2009). *Improving transparency, integrity, and accountability in water supply and sanitation: Action, learning, experiences*. World Bank.

Grillos, T., Zarychta, A., & Nuñez, J. N. (2021). Water scarcity & procedural justice in Honduras: Community-based management meets market-based policy. *World Development*, *142*, 105451. https://doi.org/10.1016/j.worlddev.2021.105451

Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? *Economics of Governance*, *3*(1), 23–45. https://doi.org/10.1007/s101010100039

Gyimah-Brempong, K. (2002). Corruption, economic growth, and income inequality in Africa. *Economics of Governance*, *3*(3), 183–209. https://doi.org/10.1007/s101010200045

Habibov, N. (2016). Effect of corruption on healthcare satisfaction in post-soviet nations: A cross-country instrumental variable analysis of twelve countries. *Social Science & Medicine*, *152*, 119–124. https://doi.org/10.1016/j.socscimed.2016.01.044

Hasan, M. M., & Alam, K. (2020). Inequality in access to improved drinking water sources and childhood diarrhoea in low-and middle-income countries. *International Journal of Hygiene and Environmental Health*, *226*, 113493. https://doi.org/10.1016/j.ijheh.2020.113493

Holmberg, S., & Rothstein, B. (2011). Dying of corruption. *Health Economics, Policy and Law*, *6*(4), 529–547. https://doi.org/10.1017/s174413311000023x

Jindra, C., & Vaz, A. (2019). Good governance and multidimensional poverty: A comparative analysis of 71 countries. *Governance*, *32*(4), 657–675. https://doi.org/10.1111/gove.12394

Justesen, M. K., & Bjørnskov, C. (2014). Exploiting the poor: Bureaucratic corruption and poverty in Africa. *World Development*, *58*, 106–115. https://doi.org/10.1016/j.worlddev.2014.01.002

Kenny, C. (2009). Measuring corruption in infrastructure: Evidence from transition and developing countries. *Journal of Development Studies*, *45*(3), 314–332. https://doi.org/10.1080/00220380802265066

Knack, S. (2007). Measuring corruption: A critique of indicators in Eastern Europe and central Asia. *Journal of Public Policy*, *27*(3), 255–291. https://doi.org/10.1017/s0143814x07000748

Krolikowski, A. (2014). Can mobile-enabled payment methods reduce petty corruption in urban water provision? *Water Alternatives*, *7*(1).

Lee, M. M., Walter-Drop, G., & Wiesel, J. (2014). Taking the state (back) out? Statehood and the delivery of collective goods. *Governance*, *27*(4), 635–654. https://doi.org/10.1111/gove.12069

Lehne, J., Shapiro, J. N., & Eynde, O. V. (2018). Building connections: Political corruption and road construction in India. *Journal of Development Economics*, *131*, 62–78. https://doi.org/10.1016/j.jdeveco.2017.10.009

Logan, C., Parás, P., Robbins, M., & Zechmeister, E. J. (2020). Improving data quality in face-to-face survey research. *PS: Political Science & Politics*, *53*(1), 46–50. https://doi.org/10.1017/s1049096519001161

Marks, D., & Breen, M. (2021). The political economy of corruption and unequal losses in water and sanitation services: Experiences from Bangkok's wastewater sector. Unpublished manuscript.

Marson, M., & Savin, I. (2015). Ensuring sustainable access to drinking water in Sub Saharan Africa: Conflict between financial and social objectives. *World Development*, *76*, 26–39. https://doi.org/10.1016/j.worlddev.2015.06.002

Mauro, P. (1995). Corruption and growth. *Quarterly Journal of Economics*, *110*(3), 681–712. https://doi.org/10.2307/2946696

Mauro, P. (1998). Corruption and the composition of government expenditure. *Journal of Public Economics*, *69*(2), 263–279. https://doi.org/10.1016/s0047-2727(98)00025-5

Mekong Watch (2010). *Samut Prakarn (Klong Dan) wastewater management project in Thailand*. Mekong Watch.

Nguyen, T. V., Bach, T. N., Le, T. Q., & Le, C. Q. (2017). Local governance, corruption, and public service quality: Evidence from a national survey in Vietnam. *International Journal of Public Sector Management*, *30*(2), 137–153. https://doi.org/10.1108/ijpsm-08-2016-0128

Peiffer, C., & Rose, R. (2018). Why are the poor more vulnerable to bribery in Africa? The institutional effects of services. *Journal of Development Studies*, *54*(1), 18–29. https://doi.org/10.1080/00220388.2016.1257121

Reinikka, R., & Svensson, J. (2006). Using micro-surveys to measure and explain corruption. *World Development*, *34*(2), 359–370. https://doi.org/10.1016/j.worlddev.2005.03.009

Sohn, J. (2007). *Development without conflict: The business case for community consent*. World Resources Institute. https://files.wri.org/s3fs-public/pdf/development_without_conflict_fpic.pdf

Sundström, A. (2016). Corruption and violations of conservation rules: A survey experiment with resource users. *World Development*, *85*, 73–83. https://doi.org/10.1016/j.worlddev.2016.04.011

Tanzi, V., & Davoodi, H. (1998). Corruption, public investment, and growth. In *The welfare state, public investment, and growth* (pp. 41–60). Springer.

Tetreault, D., & McCulligh, C. (2018). Water grabbing via institutionalised corruption in Zacatecas, Mexico. *Water Alternatives*, *11*(3), 572.

Transparency International (2008). *Global corruption report 2008: Corruption in the water sector*. Cambridge University Press.

Uslaner, E. M. (2004). Trust and corruption. In J. Lambsdorf, M. Taube, & M. Schramm (Eds.), *The new institutional economics of corruption* (pp. 90–106). Routledge.

Wei, S. J. (2000). How taxing is corruption on international investors? *The Review of Economics and Statistics*, *82*(1), 1–11. https://doi.org/10.1162/003465300558533

Williams, A., & Siddique, A. (2008). The use (and abuse) of governance indicators in economics: A review. *Economics of Governance*, *9*(2), 131–175. https://doi.org/10.1007/s10101-006-0025-9

Winter, J. C., Darmstadt, G. L., & Davis, J. (2021). The role of piped water supplies in advancing health, economic development, and gender equality in rural communities. *Social Science & Medicine*, *270*, 113599. https://doi.org/10.1016/j.socscimed.2020.113599

Yan, J., & Oum, T. H. (2014). The effect of government corruption on the efficiency of US commercial airports. *Journal of Urban Economics*, *80*, 119–132. https://doi.org/10.1016/j.jue.2014.01.004

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