CHAPTER 4

Rural Water Supply Corruption in Ethiopia

Roger Calow, Alan MacDonald, and Piers Cross

Introduction

In Ethiopia, investment in rural water supply underpins the government's poverty reduction efforts. The challenge is huge: roughly 50 percent of the (mainly rural) population still have no access to safe water, and the country has the highest number of people in Sub-Saharan Africa without access to improved water supply and sanitation. The consequences are dire: every year, roughly 250,000 children die from diseases related to poor water and sanitation, and many others face the daily grind of collecting water from distant sources.

To meet the challenge, the government has set ambitious targets under its Universal Access Program (UAP) to achieve full coverage by 2012, with major investment from government, donors, and (increasingly) communities. Considering the scale of the challenge, Ethiopia has made significant

The authors would like to acknowledge the contributions and field work by Derek Ball, Yemareshet Yemane, and Elizabeth Mekonnen.

Although this chapter results from studies completed by January 2010, the process of checking, reviewing, and securing agreement for publication was finally brought to conclusion only in late 2011. The chapter is therefore put forward with the caveat that while it reflects the situation at the time of the study, some details will have understandably changed.

progress in attracting finance to the sector. The government of Ethiopia estimates that to meet its UAP target for rural water supply, annual expenditure of more than Br 1.1 billion (US$99 million) is required, of which more than 90 percent is already committed. At the same time, dramatic reforms have resulted in the development of a programmatic approach to improve aid effectiveness in tandem with large-scale decentralization—both political and administrative.

The sheer scale of investment required to meet the UAP target raises inevitable questions about how well the money is spent: Is corruption a significant issue? Might it affect the delivery of basic services? If so, by how much? Internationally, water is viewed as a high-risk sector because of the financial flows involved, weak government oversight, and significant public-private interactions involved in infrastructure provision. However, there is little concrete evidence of specific risks or of the effectiveness of different interventions and reforms that might reduce them. In Ethiopia, no previous studies have attempted a systematic assessment of the nature and extent of corruption, either within the water sector in general or in the provision of rural drinking water supply in particular.

In view of the sums of money involved, ensuring that funding translates into improved services for poor people is a clear priority. Yet little is known about how robust or effective the current systems are to prevent corruption and enable the national program to meet its goals. Internationally, recent initiatives have identified corruption as a contributor to poor water governance and, more specifically, as a constraint on service delivery to those most in need. Is this the case in Ethiopia?

Objectives

Against this background, the study of corruption risk discussed in this chapter aims to shed light on the importance, scope, and nature of corruption in the provision of rural drinking water supplies.[1] The study has three broad objectives:

- Map the different forms, links, and scope of corruption in Ethiopia's rural water supply along the service delivery "value chain"—from policy development (at the top of the chain) to scheme implementation and management (at the bottom)
- Identify particular points along the value chain that are vulnerable to corruption, backed up with qualitative and quantitative data on perceptions and evidence
- Work with key sector stakeholders to validate findings and develop recommendations to address vulnerabilities.

Methodology

To meet these objectives, a team of international and local consultants developed a diagnostic approach for mapping corruption, interviewed sector stakeholders, and conducted a field survey of rural drinking water boreholes, specifically as follows:

- *At the policy making and federal level*, a stakeholder analysis of rural water supply policy making, planning, and budgeting included more than 50 interviews with sector stakeholders representing the government, donors, nongovernmental organizations (NGOs), and the private sector.
- *At the project and program level*, an evaluation of borehole procurement, construction, and management included contract specifications; actual construction standards and invoices; and a postconstruction survey of 26 shallow boreholes in the Southern Nations, Nationalities and People's Region (SNNPR) and Oromia—using down-the-borehole, closed-circuit television (CCTV) equipment—to determine whether completed infrastructure had been built to contract and invoiced correctly.
- *At the community level*, the team conducted a survey to ascertain village perceptions and governance associated with borehole development and management at the selected sites.

Key findings from the interviews and sample survey were then presented and discussed at a validation workshop in Addis Ababa, opened by the minister of water and hosted by the Federal Ethics and Anti-Corruption Commission. More than 40 sector stakeholders, drawn from the groups above, attended the workshop.

Why the focus on rural drinking water supply, particularly on groundwater-based rural water supply? Three reasons:

- The government's target to achieve full coverage depends crucially on developing groundwater; this provides (a) the only cost-effective way of meeting dispersed rural demand at relatively low cost and (b) a buffer against climate variability.
- The UAP emphasizes the importance of affordable technologies, including shallow boreholes.
- It has previously been difficult to assess the extent of corrupt practices in the provision of groundwater-based supply because groundwater is "out of sight and out of mind." By adopting a new technique for assessing subsurface construction standards and by comparing the findings with design specifications, invoices, and community perceptions of construction, the study has piloted an approach that could be applied

more widely in Ethiopia and other countries to monitor service provision and reduce corruption.

Summary of Findings

Broadly speaking, Ethiopia has made significant strides in policy development, financing, governance, and management, resulting in *generally low levels of corruption and perceptions of corruption along the value chain*. That said, the study highlights a number of vulnerable areas, particularly at the lower (procurement and construction) end of the value chain, and stakeholder perceptions of corruption vary significantly in some instances.

Chapter Structure

The chapter is organized as follows:

- "Corruption in the Water and Sanitation Sector" examines the causes, costs, and consequences of corruption in the water sector generally, drawing on recent international studies. The value chain approach to understanding corruption risk is presented in more detail.
- "Ethiopia's Water Sector" describes the characteristics of the water sector in Ethiopia before focusing on the rural drinking-water supply in particular. Recent sector reforms and financing are discussed, underlining the importance of providing secure water for highly vulnerable rural populations.
- "Rural Water Supply Corruption in Ethiopia" presents the study findings along the value chain of sector functions: (a) policy making and regulation; (b) planning, budgeting, and transfers; (c) design, tendering, and procurement; (d) borehole construction and payment; and (e) local management of completed infrastructure. The section includes an in-depth discussion of the approach and findings of the field surveys.
- "Summary and Recommendations" recaps the key findings and presents 10 recommendations for reducing corruption risks and strengthening accountabilities at vulnerable points along the value chain.

Corruption in the Water and Sanitation Sector

Three recent documents provide comprehensive analyses and overviews on the extent of corruption in the water sector:

- Transparency International's *Global Corruption Report 2008: Corruption in the Water Sector* reviews the entire water sector through essays representing different perspectives (TI 2008).

- *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level* includes an examination of the water supply and sanitation sector in Africa (Campos and Pradhan 2007).
- A comprehensive World Bank sourcebook on the urban water and sanitation sector was developed to help water and sanitation practitioners diagnose the extent and risks of corruption in urban areas (Halpern et al. 2008).

These sector reviews have two common themes: (a) the potential for, and risks of, corruption in the water sector; and (b) the paucity of empirical data, thus the need for further field research. Inclusion of the water sector in the Ethiopia country diagnostic studies is a timely addition to this growing body of knowledge.

Potential for Water Sector Corruption

The water sector is characterized by its diversity. Water, literally, is involved in most human activities, and predicting the actual scale of corruption in any specific water operation is hazardous without a specific local assessment.

There are many different types of water services and many actors involved at several levels—from politicians to pipe manufacturers, consultants to consumers, local government officials to lab technicians, public agencies to private enterprises, vendors to donors, and planners to philanthropists. Water corruption can be either *grand* (the misuse of vast amounts of public sector funds by a relatively small number of officials) or *petty* (a large number of officials abusing their public office by extracting small bribes and favors, generally directly affecting the poorest). Indeed, water corruption includes all of these forms:

- *Bribes*: the offering or payment of money, services, or valuables to public officials to persuade them to do something (quicker, better, or more in their interest)—for example, a bribe to get pipes repaired
- *Fraud*: an economic crime involving deceit or trickery for unlawful gains—for example, fraudulent CVs to get a job or license in water or the moonlighting of state-owned rigs
- *Nepotism*: the exploitation of an individual's own power and authority to procure favors for relatives or friends—for example, water sector jobs for relatives
- *Embezzlement*: the misappropriation of public resources (property or funds) legally entrusted to someone in his or her formal position as an agent or guardian—for example, the misuse of water funds.

Water supply and sanitation services in developing countries have a number of characteristics that make them appear highly prone to corruption, including the following:

- *Monopolistic public service providers* are associated with weak regulation; when public services fail, they are supplemented by informal, often illegal, private services, which distort sector pricing.
- *Large flows of public money* (high-cost assets) and uncoordinated donor contributions may be subject to few of the controls that would be expected in private financing. Furthermore, the sector rarely achieves full cost recovery, depends on government subsidies, and sector financing often fails to achieve its financial objectives.
- *Complexity of stakeholders' relationships* and no clear institutional leadership result in a lack of clarity of rules, regulations, roles, and responsibilities.
- *Asymmetry of information* on sector policies and procedures means there is little shared understanding of how systems work, who does what, and what the costs of water services are or should be.
- *Little accountability* in user-provider relationships means that, at best, most systems use "the long route to accountability," in which governments mediate between consumers and providers.

Many of the fundamental issues—such as low capacity, low wages, dysfunctional institutions, and large-scale procurement—are common to public service delivery. The water and sanitation sector is also part of the construction sector, globally thought to be the most corrupt of all sectors (TI 2005).

Water Sector Corruption Costs

What does water corruption cost? There is no clear answer. Hypotheses on the scope and incidence of corruption in the water and sanitation sector are largely untested, and the range appears large. An order of magnitude has been estimated at as much as 30–40 percent in "highly corrupt" countries; a path-breaking study in South Asia estimated 25–30 percent (Davis 2004). In the urban sector, if water utilities were operating in corruption-free environments, costs could be reduced by an estimated 64 percent (Estache and Kouassi 2002). If the 30 percent estimate is correct and water investment matches Millennium Development Goal (MDG) needs,[2] up to US$20 billion could be lost to corruption in the next decade.

Adding to the potential risks are the trends toward decentralization and the adoption of sectorwide approaches with weaker project controls. Many studies concentrate on bribery and direct consumer interactions and neglect to account for the types of corruption that occur higher up the value chain.

Causes of Water Sector Corruption

Klitgaard's (1998) diagnostic of corruption risk (namely, Corruption = Monopoly + Discretion – Accountability), provided in the context of municipal service delivery in Bolivia, is relevant to an understanding of the water and sanitation sector in developing countries because it highlights the aggregate effect of monopoly and discretionary power. A number of anticorruption advocates, including Klitgaard, identify four key factors that engender opportunities for corruption: monopoly power, wide discretion, weak accountability, and lack of transparency.

At the heart of the corruption problem in the water sector lies weak governance: ineffective public sector management, little political accountability, little private sector involvement, intentions to decentralize not borne out in practice, and limited engagement by civil society or the media.

Diagnosing Corruption in Water Supply and Sanitation Services

Plummer and Cross (2007) have posited a useful diagnostic model to establish a more comprehensive approach to understanding corruption in the water and sanitation sector, highlighting corrupt interactions within and between three broad stakeholders groups:

- *Public-to-public interactions*, ranging from public finance allocation distortions that favor projects that come with kickbacks, to corruption in public service management such as buying jobs or transfers
- *Public-to-private interactions*, including contract procurement and marked-up pricing or fraud in construction
- *Public-to-consumer interactions*, including "speed" money (bribes to give priority to repairs), illegal connections, or falsifying bills and meter readings.

These interactions occur along a value chain, encompassing a comprehensive framework of decisions and interactions—from high-level policy making to household payments—that differentiate between types of corrupt practice. The framework assists in identifying which corrupt practices exist in different settings, who is involved, and at what stage of water

and sanitation service delivery they occur along the cycle of five sector functions:

- Policy making and regulation
- Planning, budgeting, and fiscal transfers
- Tendering and procurement
- Construction and operations
- Payment and access.

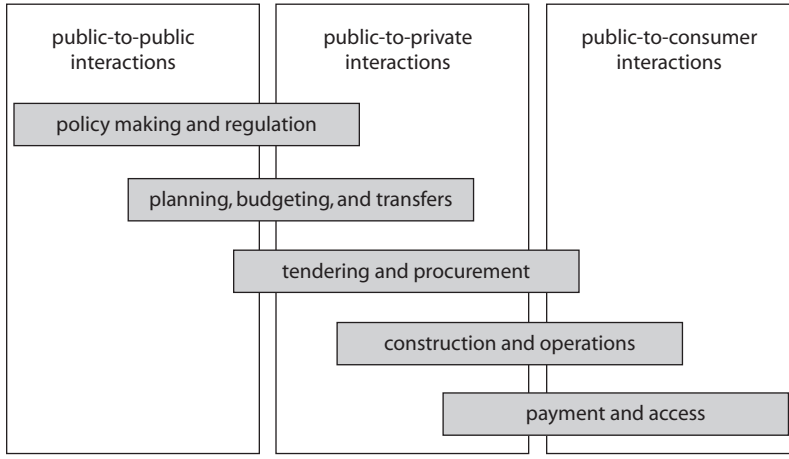
Figure 4.1 depicts a simplified version of the framework.

The current study provides an opportunity to apply the framework, and focus on interactions along the value chain, in a specific country case study and subsector. Tables 4.2, 4.3, and 4.4, later in this chapter, provide further detail on the corrupt practices typically found at each level of the value chain illustrated in figure 4.1 and identify the key issues investigated in Ethiopia. The tables formed the basis for stakeholder interviews and for discussions at the validation workshop.

Perceptions and Realities in Measuring Corruption

Corruption is difficult to measure with any reliability. Much of the literature relies on studies of *perceptions* of corruption. Although they provide an easily measurable indicator, even the best perception studies

Figure 4.1 Value Chain Framework of Corrupt Interactions in the Water and Sanitation Sector



Source: Plummer 2008.

can be entirely misleading, especially in a sector as complex as the water sector, where there are so many different interactions and so many institutions with different perspectives and motivations. The written record is also an unreliable source on such a sensitive matter: facts and perceptions about corruption are not generally recorded, and even where they are, the facts are often in dispute, and researchers have little way of determining what is actually happening. Moreover, physical audits of exactly what was constructed are expensive and time consuming, hence rarely undertaken.

In short, to take our knowledge of the water sector forward, one priority is to document more cases of actual corrupt practice in the sector to set those cases alongside what potentially could happen. Research approaches must take into account the myriad types of interactions throughout the entire value chain of decisions made by actors at varying levels. A comprehensive approach would also study the written record; analyze the perceptions of the variety of stakeholders along the entire length of the value chain; and, where possible, investigate what was actually built as well as what monies were spent against what had been commissioned.

Ethiopia's Water Sector

Water plays a pivotal role in Ethiopian society and is an input to almost all production. Water is also a force for destruction: floods and droughts account for major swings in economic growth and significant losses of life and wealth. Unmitigated hydrological variability is estimated to cost the economy one-third of its growth potential (World Bank 2006b). Yet Ethiopia's investments to mitigate these impacts and use its considerable water assets for power, food production, livestock, manufacturing, and improvements in health and livelihoods have historically been limited.[3]

In recent years, the government of Ethiopia has recognized the scale and importance of the water challenge in Ethiopia and has embarked upon a wide range of water investment programs in the following areas:

- *Water supply and sanitation*. Priority has been given to water for human development and for livestock use, with a core focus on low-cost groundwater development for urban and rural supply. The Ministry of Water Resources (MOWR) has, over the past half-decade, led a process of studies, policy, and strategy development, resulting in much-improved sector coordination, institutional reforms, significant increases in water and sanitation coverage,[4] increased financial allocations, and the development of an ambitious plan not only to meet the water and sanitation

MDGs but also to achieve universal access to basic services in rural and urban areas. Current funding for rural water supply has, at least in nominal terms, reached the annual volumes required to meet either the MDG or UAP target, although aggregate expenditure in the subsector is only 60 percent of budget (World Bank 2009).

- *Agriculture and livestock.* Agriculture accounts for a dominant share of the Ethiopian economy (almost half of gross domestic product). Yet per capita food production has declined significantly, with roughly half the population classified as food insecure. The government's Participatory Small-Scale Irrigation Development Program plans to invest US$1.68 billion over 15 years (2002–16), substantially increasing the percentage allocated for irrigated areas. Twelve projects (adding about 259,000 hectares) are scheduled for completion by 2010, and Ethiopia's National Action Plan for Adaptation has a core focus on small-scale irrigation development to reduce dependence on rainfed agriculture. Ethiopia also has the largest livestock herd in Africa, and livestock is integral to livelihoods in highland and pastoral farming systems. Livestock use is a major driver of rural water development, especially in drought-prone regions.

- *Energy and hydropower.* Roughly 95 percent of Ethiopia's electricity generation is from hydropower. The country's economically feasible hydroelectric potential is estimated to be 100 times more than current production. With demand for energy growing rapidly, the MOWR has embarked upon an ambitious five-year development plan, with seven projects under implementation or in design, involving billions of dollars of investment.[5]

- *Emergency relief.* Water provision forms a part of the emergency response to national drought or relief programs, although drought planning continues to be dominated by food rather than broader public health or livelihood needs (Calow et al. 2010). The United Nations Children's Fund (UNICEF), supported by many NGOs, provides ongoing support to the recurring problem of drought—helping to repair critical rural supplies or trucking water to protect lives and livelihoods.

Rural Water Supply in Ethiopia

Although corruption amounts may be larger in other water domains that involve higher-value contracts, rural water supply directly affects the well-being of most of the population. In short, a corrupt transaction

involving the rural water supply will have a direct or indirect impact on the poorest and largest sections of the population.

Facing extremely low access rates at the turn of the century, the MOWR embarked upon a substantial program of reforms and improvements in service development, undertaking sector studies from which they adopted a new policy frame and sector strategies. In 2001 the government adopted a water and sanitation strategy that called for the following:

- Promoting more decentralized decision making
- Promoting the involvement of all stakeholders, including the private sector
- Increasing cost recovery
- Integrating water supply, sanitation, and hygiene (WASH) promotion.

In 2005 the government announced highly ambitious targets to increase coverage in its Plan for Accelerated and Sustained Development and to End Poverty (PASDEP) for 2010. Soon afterward, it announced the UAP. The impact on the ground of these initiatives has been dramatic: in 1994 coverage was estimated at just under 15 percent, whereas the PASDEP progress report for fiscal year 2008 (based on sector administrative data) reports rural water supply coverage at 54 percent.[6]

A Framework for Progress

Within the current framework, the MOWR (and the Ministry of Health for sanitation) set national policies for rural water supply. The sector framework at the policy and strategy level seeks to incorporate several principles of good governance, including the following:

- Separating regulation from provision of services
- Decentralizing finance and management to the lowest appropriate level
- Seeking equitable access to water
- Seeking to strengthen consumer information and participation
- Making greater use of the private sector.

In October 2006 both ministries as well as the Ministry of Education signed a memorandum of understanding to define the roles and responsibilities of each.

The reforms have led to significant improvements in sector coordination and donor harmonization and alignment. The first Multi Stakeholder

Forum (MSF) in 2006 set a new standard for the sector in terms of consultation and transparency, followed by additional MSFs in December 2007 and October 2009.

Under the policy of decentralization, regional water bureaus and woreda water desks are in charge of investment planning, monitoring, and technical assistance to service providers. Although several mechanisms of financing rural water supply remain (as further discussed in the next section), the country's 700 woredas now receive block grants from the central government and can decide autonomously how to use these grants within broad criteria set by the Ministry of Finance and Economic Development (MOFED). In rural areas, community water and sanitation committees—or Water User Associations (WUAs)—operate water systems and promote sanitation, supported by woreda and regional water and sanitation government staff.

Challenges Ahead

Considering the ambition of the UAP, Ethiopia has done remarkably well in attracting finance to the sector. The combined budgeted volume of the financing modalities employed in Ethiopia (about Br 1.2 billion, or US$109 million) closely matches the government's estimated annual costs of meeting either the MDG for rural water supply (Br 900 million, US$81 million) or the UAP (Br 1.1 billion, US$99 million).[7] However, the World Bank's (2009) recent Public Finance Review added a number of caveats:

- High inflation and an increase in project costs have forced the government to revise the annual cost of implementing the UAP upward to Br 1.7 billion (US$154 million) for the 2009–12 period.
- Government and development partner support must be renewed to sustain this level of funding for rural water supply.
- Only 60 percent of budgeted finance is actually spent, with the result that funding is not being translated into an equivalent increase in service delivery.[8]

A joint technical review of rural water supply in January 2009 commended the progress made but identified the following main sector issue areas: underexpenditure, planning, capacity, procurement, and coordination at the regional and woreda levels.[9]

Table 4.1, drawn from the World Bank's (2009) recent Public Finance Review, summarizes costs and budgets for rural water supply and provides

data on the types and numbers of water points that will need to be constructed or rehabilitated to meet targets.

In summary, the national rural water supply program in Ethiopia appears to be a remarkable success story. Dramatic reforms have resulted in the development of a programmatic approach, large-scale decentralization, engagement of many sector stakeholders, and significantly increased finance. Yet little is known about how robust or effective the systems are

Table 4.1 Rural Water Supply Costs, Budgets, and Investment Priorities in Ethiopia under MDG and UAP Targets

	MDG costing for RWS (2005–15)	*UAP costing for RWS (2006–08 achievements in parentheses)*	*Adjusted UAP 2009–12 (revised 2009–12 targets)*
Additional people to be served	31.8 million	50.9 million (13.5 million)	34.5 million
No. of new schemes constructed			
Hand-dug wells without hand pumps	0	70,000 (531)	32,742
Hand-dug wells with hand pumps	47,783	38,000 (8,762)	38,920
Spring protection works	16,635	14,000 (7,238)	20,845
Shallow boreholes with hand pumps	17,989	20,000 (3,339)	11,711
Deep boreholes or gravity systems with distribution	9,740	3,000 (1,750)	2,461
No. of existing schemes rehabilitated	30,701 existing schemes	maintenance of 47,397 schemes in 2 yrs.	
Program cost (birr)	Br 9.1 over 10 yrs.	Br 7.7 over 7 yrs.	Br 6.8 over 4 yrs.
Annual cost (birr)	Br 900 million	Br 1.1 B	Br 1.7 B
Annual beneficiaries	3.2 million	7.3 million (4.5 million)	8.6 million
Annual combined budget for RWS (birr)		Br 1.2[b]	
Annual combined actual spending on RWS (birr)[a]		Br 731 million[b]	

Source: World Bank 2009.

Note: MDG = Millennium Development Goal. UAP = Universal Access Program. RWS = rural water supply. The UAP aims to achieve 98 percent rural water supply coverage compared with the MDG target of 66 percent. However, investment requirements under the UAP are lower because of the focus on low-cost technologies and community financing.

a. Includes all domestic, official development, and NGO funding for rural water supply.

b. Includes an estimated Br 30 million from bilateral donors other than Finland.

in preventing corruption and enabling the national program to reach its goals. Indeed, risk factors for corruption include all of the following:

- The very speed of program development
- The extent of decentralization
- Questions about the lack of staff, experience, and skills at lower levels
- The substantially increased activity and money being invested in the sector.

Rural Water Supply Corruption in Ethiopia

Policy Making and Regulation

Corrupt practices may occur at the policy-making level within the public sector. Politicians and officials responsible for water sector policies might seek to influence the focus of policy (that determines investment priorities) to set up future opportunities for rent seeking. In turn, regulators can be bought by politicians and other stakeholders to determine standards and regulations (regulatory capture) or to allow projects to bypass established standards or procedures.

At higher levels of government, such corruption is typically opaque and complex, but distortions in the allocation of resources are achieved only by collaboration within water departments and between line departments such as financing and planning (Plummer and Cross 2007).

Risk: low to medium. The available evidence from Ethiopia, and the perceptions of water sector stakeholders, indicates that corruption risk at this level is generally low to medium. Table 4.2 summarizes the findings of the study team and the views of workshop participants on some of the key issues.

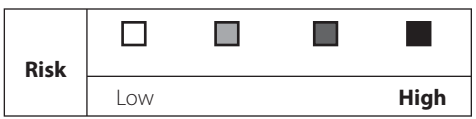
Few opportunities for rent seeking at the policy-making level appear to exist for politicians in the rural water sector in Ethiopia because funding mechanisms and prioritization are reasonably systemized, transparent, and rules-based (as discussed in further detail below). However, adherence to sector policies and strategies appears to vary by region, dependent partly on resource allocations and partly on the degree to which knowledge about sector policies and priorities filters down to lower levels of government.[10] At the regulatory level, there is good to excellent compliance.

Role of state-owned drilling companies. One potential area of concern is the position of the government-owned drilling companies favored for

Table 4.2 Corruption Risk in Policy Making, Planning, and Budgeting in the Ethiopian Rural Water Supply Sector

Value chain area	*Typical corrupt practices in water delivery chain*	*Risk areas evaluated by study team in Ethiopia (RWS)*	*Risk ST*	*Risk WS*
Policy making and regulation	• Policy capture (competition and monopolies) • Regulatory capture (e.g., waivers to regulations and licensing)	• Monopoly position of drilling companies (e.g., regional drilling enterprises in some areas or for some types of work)	■	■
		• Regulation of design and construction (standards for borehole design, evidence of overengineering, collusion between companies)	□	□
		• Licensing or registration practice and procedure for drilling companies (bias, selection)	■	■
Sector-level planning, budgeting, and transfers	• Distortions in decision making by politicians (affecting location and types of investments) • Corruption in national and sector planning and budget management (misuse of funds, interministerial bribery for fund allocation, collusion or bribery in selection and project approval) • Corruption in local budget management (fraud, falsification of accounts or documents) • Bribery to influence allocation of resources • Bribery in sector budgeting management (national and local) • Donor-government collusion in negotiations to meet spending or funding targets • Donor-government collusion or fraud with respect to progress and quality	• Distortions in on-budget and off-budget allocations to regions, zones, and woredas (preferential treatment, political bias)	□	□
		• Distortions in use of monitoring information (e.g., coverage) for political or funding ends	■	■
		• Link between planning and budgeting and the types of contracts used (do contracts determine the plans?)	□	□
		• Risk in shift to local-level procurement under decentralization (e.g., management and oversight of funds, local procurement)	■	■
		• Donor contribution to corrupt practices, e.g., through collusion in progress reporting or agreeing to fund moribund projects	□	□

Source: Author.
Note: RWS = rural water supply. ST = study team finding. WS = workshop finding.



on-budget allocations. The state-owned drilling companies have their origins in an era when external aid gave drilling rigs to government, and the private sector generally was viewed with suspicion. State drilling capacity has been retained and increased, continuing to play an important role in drilling in remote locations and resettlement areas, emergency situations, and conditions deemed unsuitable for the private sector, as box 4.1 describes.

Box 4.1

An Uneasy Coexistence of State and Private Drilling?

Ethiopia's drilling industry is characterized by a mix of state, private, and NGO actors, significantly increasing financial commitments in the run-up to 2015 and rapid expansion in private sector activity, both home-grown and international (Carter et al. 2006).

- *State enterprises are often the first choice for regional bureaus contracting out borehole construction work.* They have their roots in the public authorities of the postimperial early Derg period. Six of Ethiopia's regions (Tigray, Amhara, Oromia, SNNPR, Somalia, and Afar) have enterprises engaged in borehole drilling, while some of the same regions and two others (Benishagul-Gumuz and Gambella) maintain drilling capacity within their water resource bureaus. In the past, state enterprises have received considerable support in the form of rigs and training from a number of donors, including the Japan International Cooperation Agency and UNICEF.
- *The emergence of private drilling companies is a relatively recent phenomenon.* The oldest private contractor, Hydro Construction and Engineering Co. Ltd., commenced business in Ethiopia in 1991. More recently, a number of international firms have entered the market, significantly undercutting the indigenous private sector and prompting claims from established companies that they must be taking shortcuts. There are currently around 25–30 private operators.
- *NGOs also maintain their own drilling capacity.* Others (for example, WaterAid [2008]) subcontract drilling to private or state enterprises but use their own in-house or consultant expertise for surveys, design, and supervision.

Where are the corruption risks? Although state enterprises are expected to operate in a financially viable manner without state subsidy—and to compete

(continued next page)

Box 4.1 *(continued)*

with the private sector—in reality they appear to capture work on unfair terms, often on a single-source basis. This situation may reflect the historical legacy of state control in the sector and a continuing suspicion of the private sector rather than corrupt practice *per se*. However, the opaque circumstances under which state enterprises compete or are single-sourced for bids, their higher costs, and reports that state drillers subcontract work to the private sector create conditions under which corrupt practices might emerge. That said, the private drilling companies interviewed did not identify unfair competition and corrupt practices as major issues. This response may indicate (for the moment, at least) that there is more than enough work to go around.

Sources: Authors' interviews (June 2009) and Carter 2006.

Drilling practices by these state-owned enterprises (SOEs) appears to be less efficient (incurring delays and higher economic costs) and less transparent (documentation is poorer and more difficult to access) than using private sector drillers. From a bureaucratic perspective, however, it is often easier for government officers to allocate required boreholes to government drillers because the processes are simpler and the responsibility gets transferred to another government department. Although this practice is arguably inefficient, there is little evidence to suggest there is more *corruption* in government-drilled boreholes, and oversight of all drilling operations remains at federal or regional levels.[11]

Licensing policy a barrier to entry. Licensing of drilling companies is another potential area for corruption. The current specifications require that licensees have the experienced personnel and equipment to undertake professional operations. However, some stakeholders argued that the requirements (for example, around rig ownership and not recognizing leasing) prohibit new market entrants and that the licensees are, in practice, a smallish, closed shop.

Addressing this issue would require a policy change to encourage the emergence of new drilling companies, especially indigenous companies that find it particularly hard to meet licensing criteria. Policy components might involve accepting leasing arrangements, facilitating credit, and supporting training for new Ethiopian drilling businesses.

Planning, Budgeting, and Transfers

Grand corruption—the misuse of vast amounts of public sector funds by a relatively small number of officials—is most likely to occur during the planning and budgeting processes associated with project and sector investments. Corrupt practices along this portion of the value chain may include the following (Plummer and Cross 2007):

- Favoring of large, capital-intensive works, where opportunities for bribery and rent seeking are greatest
- Manipulation of budgets, particularly where there is a disconnect between policy objectives and planning and implementation
- Corruption in local budget management (for example, fraud or falsification of accounts)
- Corruption in fund allocation and transfers (for example, through approval systems that operate between ministries and line departments).

Risk: low to medium. In poor countries, where the aid budget is a significant contributor of finance to the sector, the value chain is strongly influenced by the type of financing and conditions of use. A number of studies have highlighted the risk of corruption in donor-financed, poverty-focused projects—for example, where aid harmonization rather than spending efficiency becomes the key factor driving structural shifts in poverty reduction strategies. Indeed, the focus on budget support and alignment may provide a much greater degree of discretion, or fiduciary risk, in budget allocation and spending than traditional project-based investment.

In Ethiopia, sector-level planning, budgeting, and financial transfers have changed significantly over recent years—reflecting shifts in both government policy (particularly around decentralization and revisions to the UAP) and donor financing. Such major changes might be expected to increase the risk of corruption in sector budgeting and transfers as new systems "bed in," yet perceptions from Ethiopia indicate that corruption in these areas is viewed as generally low-risk, albeit with some variation among regions. Table 4.2 summarizes the findings of the study team and views of workshop participants about sector planning, budgeting, and fiscal transfer issues, highlighting moderate risk only in relation to local-level procurement and the use and abuse of monitoring information.

Sector planning issues. In terms of sector planning, there is a clear recognition that to meet UAP and MDG targets and to ensure sustainability, low-cost technologies that can be partially financed and maintained by local communities are preferable to high-tech options (as previously shown in table 4.1). Indeed, the revised UAP places a priority on low-cost household technologies, including self-supply, as a key means of extending water access in rural areas (MOWR 2008), although this approach is not without its critics.[12]

For rural water supply, then, low-cost, groundwater-based approaches (self-supply, shallow wells, boreholes) are recognized as the only realistic way of meeting dispersed demand across *most* areas of the country, with private sector involvement based on local artisans rather than large firms.

Budgeting and transfer-related risks. In terms of budgeting and transfers, the rural water supply sector is characterized by a range of discrete financing modalities, set against a background of political and administrative decentralization.[13] The study team therefore addressed these key questions: (a) whether the general shift toward budget support and alignment creates opportunities for the misappropriation of funds and distortion in on-budget and off-budget allocations; and (b) whether the decentralization of resources to lower levels of government, where administrative capacity is more limited, generates similar risk.

As noted above, corruption risk in both areas was assessed as generally low, albeit with some regional variation. In particular, there was broad consensus across stakeholder groups that budgeting and transfers are rules-based and reasonably transparent, with well-developed systems of monitoring and oversight, at least down to the regional level.

Specifically, on-treasury and on-budget funds managed through the government's core budget and expenditure system are allocated to regions through block grants according to a strict formula developed by MOFED and approved by the House of Federation, as further explained in box 4.2. Similarly, on-budget and on-treasury funds channeled through the new multidonor pooled fund—and ring-fenced, or earmarked, for WASH investments—are allocated to regions through a similar, formula-based approach, albeit through a parallel accounting system.[14] Remaining (bilateral) donor investment in the sector (from Finland, Italy, Japan, and the United States), and NGO investment in water projects, is generally provided directly to service providers and is therefore off-budget and

Box 4.2

The Intergovernmental Fiscal Transfer Formula: Dividing Money Fairly among Regions

A new formula for allocating the federal government's "general purpose" grants to individual regions was introduced in 2007. The new formula has three basic principles, or objectives:

- Ensure that all Ethiopians are entitled to a similar range and level of service delivery.
- Make the transfer independent of regions' tax efforts or expenditure levels (effort-neutral).
- Ensure that regions that are forced to spend more than the "standard expenditure"—for example, because of their dispersed populations or entrenched poverty—are entitled to budgetary support.

Variables included in the formula are population; differences in relative revenue-raising capacities; differences in relative expenditure needs (to meet basic needs, including water); and performance incentives. The approach strives for equal per capita distribution of grants while considering the regions' needs or capacities.

The formula has been the subject of intense negotiation. However, it has been agreed to and accepted by the regions and provides clear criteria for allocating funds.

Source: World Bank 2009.

off-treasury. Disbursement and reporting systems vary but are generally viewed as efficient and low-risk.

A subject of considerable debate is the allocation of regional block grants (through Channel 1) to lower levels of government, in particular allocations for rural water supply. Ethiopia's federal system gives regional states a high degree of autonomy over their public finances, and it is difficult to track levels of funding for different services—including rural water supply—at lower levels with precision (World Bank 2009). In practice, the discretion afforded to regions over the allocation of block grants is limited by existing commitments, capacity, and staffing levels. Public sector salaries set at the federal level absorb a major proportion of the grants: More established regions (Oromia, for example) tend to devolve

more funds because they have greater local government capacity to prioritize and administer them. And some regions (the more established ones) have developed their own regional formulae for cascading funds down to zones and woredas.

A broad conclusion is that although corruption in the transfer and allocation of funds between different levels and sectors is probably minimal, there may be significant subregional variation in the transparency of budgeting, in the administration of budgets and procedures, and hence in corruption risk. In contrast, WASH funds allocated to regions and woredas through the donor trust fund (Channel 1b) are clearly ring-fenced through special accounts at each level, reducing the perceived risk of leakage to other sectors, corrupt or otherwise. The key issues here relate more to the *use* of funds (low utilization rates) than to *abuse* as well as to the potential trade-offs between procedural oversight, scheme quality, and the speed of implementation. Project-based investment, meanwhile, is also strictly controlled, albeit through a variety of different organizations and accounting arrangements.

Risks from decentralization. One policy shift highlighted as offering corruption opportunity is administrative decentralization. Although decentralization policies have devolved tasks and responsibilities down to lower levels of government, funding has not always followed. In particular, control of woreda budgets tends to remain at the regional and federal levels, with small shares transferred through block grant channels for capital expenditure. Hence, one reason why subregional corruption is viewed as low-risk is because of the small amounts of money filtering through, presenting few opportunities for the misappropriation of funds in spite of low pay and weak accounting systems.

Should there be more devolution to the woredas, or are the risks too great? Although it makes sense for woredas to plan and implement low-end technologies (for example, spring protection and self-supply) and to be funded accordingly, there are sound technical, economic, and anticorruption arguments for retaining borehole procurement at regional-zonal levels—where the core expertise exists, where economies of scale are present in the batching of contracts, and where procurement and oversight systems work reasonably well.

Needs for greater oversight and transparency. Monitoring and evaluation were also identified as weaknesses by both the study team and workshop participants, though the systems in place are arguably superior to

those in many developing countries. Several priorities have a bearing on corruption risk:

- Regional inventories of infrastructure, though implemented, do not link schemes to financing modalities, making attribution impossible to verify except through field visits (World Bank 2009).
- Monitoring output data—what is being built where—is inadequate, making it difficult to know whether spending is cost-effective and whether (and where) money might be leaking. Better tracking of funds as they move along the transfer system toward water projects would reduce the risk of corruption and improve planning.
- Monitoring and information systems for assessing access to water supply and sanitation facilities were viewed as problematic, though improving.[15]

Many interviewees reported problems with "coverage inflation," or "information corruption," as one person put it. Coverage figures are routinely inflated as they pass upward from woredas to the regional and federal levels, with politicians eager to show progress against targets.[16] Whether this practice fosters real corruption is a moot point. Given that coverage inflation could lead to reduced funding under the block grant formula, the answer would appear to be "no," although the perception of corruption remains.

Design, Tendering, and Procurement

Procurement requires public-private interaction for the purchase of a wide range of goods and services, including borehole drilling and materials. For this reason, it is one of the most well-publicized and well-documented faces of corruption in the water sector (Plummer and Cross 2007). Depending on country context and project area, a number of public actors may be involved, from national to local. Private actors may include suppliers, contractors, operators, or local and national consultants. Corruption may influence the selection of contracts for services and supplies, payment schedules, profit margins, and the outcomes of the regulatory process (Plummer and Cross 2007).

In Ethiopia, the drilling sector is characterized by a mix of private operators, both national and international, and SOEs. Procurement can be carried out by government institutions (typically regional bureaus) or directly by donors and NGOs; the method depends on both financing modalities and whether the commissioning agent has in-house drilling capacity.

The tendering and procurement process for borehole drilling has undergone major changes in recent years. In particular, national procurement guidelines are now closely aligned with international or donor systems, such as those developed in the World Bank's WASH program. In addition, all public sector institutions in Ethiopia have recently been required to complete a business process reengineering plan, under which all organizations start with a clean slate in looking at ways to improve efficiency, effectiveness, and transparency.

The competitive tendering process. Well drilling financed by the Ethiopian government, UNICEF, and other United Nations agencies, including that financed through the government's Food Security and Productive Safety Nets programs, can either be competitively tendered or sole-sourced to SOEs.

Where drilling is competitively tendered, national procurement procedures are followed. Projects financed by the World Bank and the African Development Bank are always competitively tendered; those banks' procurement procedures are carried out in accordance with their respective procurement guidelines.[17]

National competitive tenders for drilling companies (consultants) follow these steps:

- The MOWR or regional water bureaus advertise bids in national newspapers. Interested bidders can either register for prequalification or, in the absence of a prequalification stage, purchase bid documents directly. A prequalification process is more common on larger bids.

- In the case of prequalification, a single expression of interest is submitted by each bidder and evaluated against preset criteria specific to the work involved. Criteria commonly include license status, prior experience of similar work, financial liquidity, and the capacity and number of drilling rigs and other equipment (vehicles, for example). Those bidders that meet prequalification criteria then receive the full tender document and are invited to submit a full bid.

- Separate technical and financial proposals (sealed) are submitted by each bidder and kept in a safe place before the advertised opening date and time. An evaluation committee then assesses the proposals in the bidders' presence, with all documents initialed by committee members. Technical proposals are evaluated first. Those bids considered substantially responsive, and that provide evidence of firm

liquidity (including a financial guarantee or bid bond), are then considered for a separate financial evaluation. This two-stage "quality-quantity" evaluation is also weighted: typically the technical proposal is weighted more heavily (70–80 percent) than the financial proposal.

- Those firms that qualify for the final financial evaluation are invited to a separate meeting in which the total financial offer of each bid is read in public. The evaluation committee checks each offer—correcting for mathematical errors—to determine the lowest bid. The winning firm is then invited back, at a later stage, for final negotiation and contract signature.

Risk: low to medium. In contrast to other areas of the value chain, the stakeholders expressed no consensus on corruption risk in tendering and procurement: their views differed markedly. In particular, although serving government staff and drilling companies expressed confidence in the process—noting that the demand for drilling services is greater than available supply (reducing incentives for corruption)—other stakeholders were more critical.

Some of the most critical voices were those of ex-government staff with direct experience on evaluation committees, although their concerns may be outdated given recent changes to methods and systems. For these reasons, there was some disagreement over the risk scores assigned to different elements of the tendering and procurement process (shown in table 4.3), with the views of the study team (ST) (based on key informant interviews) contested by the validation workshop (WS) group.[18]

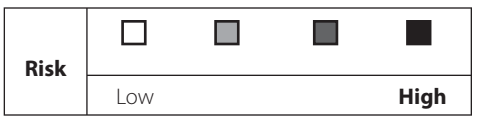
Box 4.3 summarizes some of the more critical observations on tendering and procurement relayed to the study team. These criticisms focus on how government officials and contractors, sometimes in tandem, can manipulate different steps in the process—from contract design to final award. That said, none of the stakeholders interviewed was able (or prepared) to cite *recent* cases of such corruption in rural water supply contract design, tendering, and procurement.

In addition, some interviewees expressed concerns about circumstances in which competitive bidding was not undertaken and about the SOEs' favored status in the process (as previously discussed in the "Policy Making and Regulation" subsection). For example, the precise circumstances under which SOEs acquire work in different regions and

Table 4.3 Corruption Risk in Contract Design, Tendering, and Procurement in the Ethiopian Rural Water Supply Sector

Value chain area	*Typical corrupt practices in water delivery chain*	*Risk areas evaluated by study team in Ethiopia (RWS)*	*Risk ST*	*Risk WS*
Contract design	• Influence on project-level decision making • Bribery for preferential treatment, elite capture • Distortionary decision making	• Program and contract design: favoring one particular contractor over another for corrupt reasons (e.g., by specifying one supplier's equipment or one contractor's rig)	☐	☐
		• Contract design: evidence of overengineering in design specification to generate more work for contractors or suppliers	☐	▒
Tendering and procurement	• Administrative corruption (fraud, falsification of documents, silence payments) • Interdepartment or interagency collusion over procurement and construction • Bribery to influence contract or bid organization • Corruption in delegating management: fraud to over- or underestimate assets; selection, type, and award of concessions; decisions over duration, exclusivity, tariffs, subsidies • Corruption in procurement: inflated estimates for capital works, supply of chemicals, vehicles, equipment • Falsification of documents	• Tendering process: fully competitive tendering of contracts or unexplained or unwarranted exceptions	■	☐
		• Prequalification process: e.g., inconsistencies that favor a particular contractor or group of contractors	▒	☐
		• Collusion in bids: e.g., decisions around which drilling companies compete for certain contracts, with payments offered or solicited	▒	☐
		• Objectivity and transparency of the tender assessment process: e.g., can the process favor the wrong contractor for corrupt reasons?	▒	☐
		• Contract award: potential for extortion by government officials from contractors (e.g., winning contractor asked to pay bribe to guarantee award)	▒	☐

Source: Author.
Note: RWS = rural water supply. ST = study team finding. WS = workshop finding.



Box 4.3

Contract Design, Tendering, and Procurement: Corruption Risk Examples

Some interviewees cited examples of corrupt practices in contract design, tendering, and procurement, as summarized below.

- *Favoritism in design specs.* Preparation of design specifications may favor one company, or group of companies, over another. For example, if the tender includes the drilling of both shallow boreholes and deeper ones, only those companies with higher-capacity rigs would be able to compete. Similarly, tenders may require contractors to meet specific requirements in terms of equipment, personnel, and experience. Such preconditions may be entirely legitimate, but some interviewees noted that they can also be used to skew contracts unfairly to favored firms.
- *Spurious items or activities in the design specification.* For example, the tender may include activities that favored firms would know are unnecessary, such as a requirement to carry out five-day pumping tests on each borehole. Such activities might add considerably to costs, yet those close to the evaluation process would enter artificially low costs, or no costs at all, for this line item to undercut less-knowledgeable bidders.
- *Conflicts of interest in the selection of evaluation committee members.* For example, a regional bureau head may be serving on a committee evaluating a tender in which the regional (state) drilling company is competing (bureau heads usually chair or are board members of state-owned drilling companies).
- *Arbitrary exclusion of bids on spurious technical or licensing grounds.* Such exclusion of bids might cite criteria that are introduced only during the evaluation process.
- *Interference in the bidding process.* For example, a senior politician dictates the type of process to be followed (such as single-source or preselection) or directly determines the outcome.
- *Collusion among contractors to rig the bidding process.* For example, firms agree among themselves which tenders to bid for to reduce competition and inflate prices.
- *Use of "contract variations" to extend the work of a contracted company beyond the original contract.* For example, company X could be requested to complete a further 50 boreholes in area Y on the back of an existing contract, without the need for another tender.

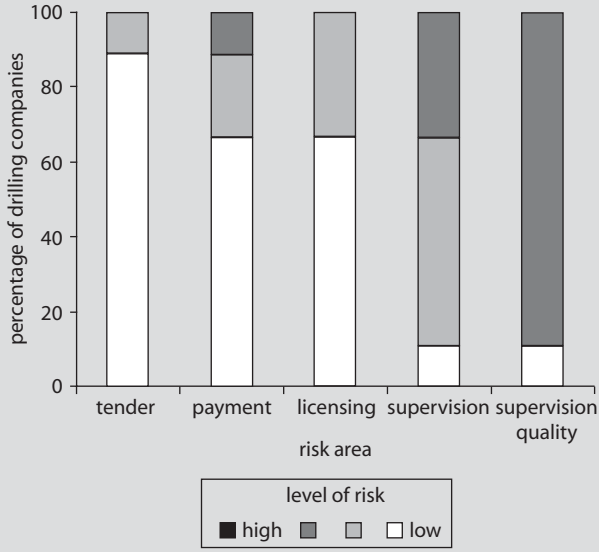
through different financing modalities remains opaque; however, most of the private drilling companies questioned were sanguine on this matter, highlighting the sheer volume of work that all parties must carry out to meet the UAP target. Box 4.4 provides a more comprehensive summary of the drilling companies' views.

Box 4.4

The Drillers' Take on Corruption Risk

The views of 10 private drilling companies interviewed before the validation workshop are summarized in box figures 4.4.1 and 4.4.2, including views on the licensing process and on supervision and sign-off procedures for borehole construction and approval.

Box Figure 4.4.1 Corruption Risks Identified by Drilling Contractors in the Ethiopian Water Sector

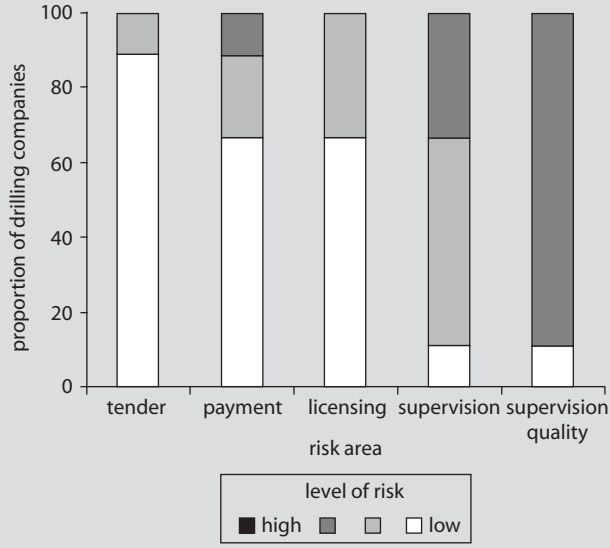


Source: Author.
Note: "Tender" refers to the tendering and procurement process. "Payment" refers to final payment for completed work. "Licensing" refers to the licensing procedure for drilling companies. "Supervision" relates to corrupt practices in on-site supervision and sign-off by government staff. "Supervision quality" refers to (noncorrupt) failures in on-site supervision (for example, officials' failure to arrive on site at agreed-upon time and poor technical knowledge of supervising officials.

(continued next page)

Box 4.4 *(continued)*

Box Figure 4.4.2 Corruption Risks Identified by Drilling Contractors in the Ethiopian Water Sector



Source: Author.
Note: "Tender" refers to the tendering and procurement process. "Payment" refers to final payment for completed work. "Licensing" refers to the licensing procedure for drilling companies. "Supervision" relates to corrupt practices in on-site supervision and sign-off by government staff. "Supervision quality" refers to (noncorrupt) failures in on-site supervision (for example, officials' failure to arrive on site at agreed-upon time and poor technical knowledge of supervising officials.

Nine of the 10 contractors interviewed stated that corruption in tendering and procurement was not a problem, again citing the volume of work available and the low incentive for corrupt practice. However, the contractors were less enthusiastic about field supervision and sign-off by zonal and regional officials, highlighting delays in approval and noting that small bribes were occasionally offered or solicited. Several also remarked on delays in payment following contract completion and invoice approval as well as the need to "speed things along" occasionally with small payments or large lunches.

Construction and Payment: The Borehole Story

After the contracts are awarded, corruption can also be prevalent in the construction of infrastructure and in final invoicing for work completed—or not completed. In construction, bribery and fraud resembles

that found in other parts of the construction industry: contractors may fail to build to specification, concealing substandard work and materials or paying officials to ignore it. Or oversight officials may demand payments to ignore instances where specifications are not adhered to. Fraudulent invoicing and documentation is another common problem.

Such practices help contractors to minimize costs and increase profit, but the outcome may be poor-quality work that affects the reliability and quality of services. Poor quality may be visible, as in the case of a dam or community tap, or it may be invisible absent a physical audit. Groundwater development is a case in point: A contractor that drills a shallow borehole and then claims payment for a deeper one, or who installs substandard materials inside the borehole and claims otherwise, can "hide" bad practice beneath the ground. Corruption then becomes difficult to detect.

In Ethiopia, groundwater development to meet dispersed rural demand underpins the UAP. Yet despite massive (and accelerating) investment in borehole drilling (as shown previously in table 4.1), little is known about corruption in drilling and water point construction. Could this be a serious problem, or is this part of the value chain reasonably clean?

The evaluation approach. To answer this question, the study team carried out a study of 26 boreholes in Oromia and SNNPR in tandem with water point interviews. The study had two main elements:

- *A postconstruction technical investigation*, using down-the-borehole CCTV equipment to assess what had actually been constructed. Findings were then compared with contract specifications, borehole completion reports, and final invoices to ascertain whether (a) what was actually built matched the design specification; and (b) what was claimed, or invoiced, matched what was actually built. In addition, data on borehole construction costs were analyzed to identify areas where major savings could potentially be made through corrupt practices.

- *A village survey*, including (a) the collection of basic information on village characteristics; (b) an assessment of the community development process in relation to water point planning and management; and (c) a simple assessment of borehole performance in terms of functionality, water availability, and water quality. In addition, a perception

survey gauged community views about the location, design, and construction of the borehole to see whether community perceptions around construction standards and outcomes correlated with the technical results.

Ball (2009) provides further survey details. In summary, the postconstruction survey focused on shallow boreholes of up to 60m depth equipped with a hand pump. In Ethiopia, these are called shallow wells. Although the sample was small, site selection was designed to capture a range of different drilling contractors (private, state, and NGO); funding channels (Channels 1, 2, and 3); and funding sources (government, donor, and NGO). Selection was carried out by the study team alone, independent of the government.[19]

At each site, a CCTV camera was used to inspect the materials installed in the borehole and to measure its depth. Information on contract specifications, well completion reports, and invoices was collected from clients and drilling companies. Village and perception surveys were based on water-point interviews with community key informants and user groups.

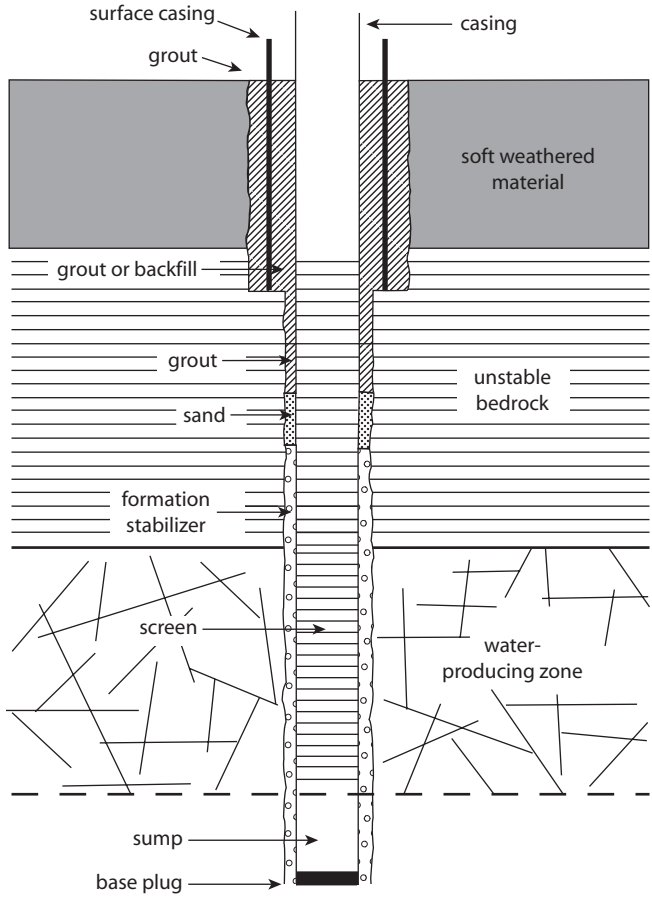
Key findings.

Corruption risk: Analyzing the costs of borehole construction. To better understand the potential for corrupt practices in borehole construction, it is first necessary to understand the major costs involved and hence the opportunities for corrupt practice.

In Ethiopia, as elsewhere, costs are incurred in (a) mobilizing a drilling team and rig to site; (b) drilling the borehole itself; and (c) equipping the borehole with a pump and the materials needed to make it work effectively and prevent contamination. These materials include casing to prevent the sides of the borehole from collapsing, a slotted screen to allow water to enter the borehole, and grout to prevent contamination from the surface (see figure 4.2).

Drawing on cost data collected from drilling contracts and invoices in the current study, the average costs of drilling a shallow borehole of less than 60m depth were approximately US$3,700, excluding hand pump installation and taxes. This cost is similar to the average cost to construct shallow boreholes in Nigeria estimated recently by UNICEF (Adekile and Olabode 2009) and in other African countries (Foster, Tuinhof, and Garduno 2008), although international comparisons should be treated with caution.[20] For shallow boreholes, drilling is the most significant cost.

Figure 4.2 Typical Borehole Construction in Ethiopia



Source: Ball 2009.

For this reason, the most likely corrupt practice in the construction process is to drill short, as box 4.5 explains.

Risk: low to medium. The available evidence from Ethiopia, and the perceptions of water sector stakeholders, indicates that corruption risk at this level is generally low to medium. Table 4.4 summarizes the findings of the study team and the views of workshop participants on some of the key issues.

Survey results, summarized in the annex, were also discussed with workshop participants in Addis Ababa (as specified in table 4.4). In

Box 4.5

The Costs of Shallow Well Construction: Where Are the Corruption Risks?

An analysis of invoiced costs for the boreholes in this study indicates that drilling costs make up roughly half the total cost of a shallow borehole, with total costs varying between US$2,700 to US$4,800 per borehole (excluding hand pump installation and taxes, both minor costs). These numbers are similar to those found in other African countries. For example, a recent study of borehole costs across Nigeria found median costs per shallow borehole (< 50 meters [m]) of approximately US$5,000 (Adekile and Olabode 2009), although costs of around US$120 per meter are not unusual for shallow boreholes in Africa (Ball 2004; Foster, Tuinhof, and Garduno 2008).

Deeper boreholes, drilled at a larger diameter and equipped with motorized pumps, cost considerably more. The two deeper boreholes included in the current survey cost US$12,000 and US$20,000 for depths of 99 m and 174 m, respectively, before pump installation and taxes. This falls within the cost range reported by the Carter et al. (2006) for deep boreholes in Ethiopia. This type of borehole is rarely used for rural water supply in other areas of Africa, so cost comparisons are difficult. However, Adekile and Olabode (2009) quote similar numbers for deep boreholes in Nigeria, with costs of US$18,000–$26,000 for boreholes of 100–150 m depth.

The particular hydrogeology of Ethiopia makes deeper boreholes successful: similar boreholes would fail over much of the continent. In addition, a culture of deep borehole drilling in Ethiopia, even in circumstances where shallow boreholes would be successful, means that deep boreholes are often preferred. Box figure 4.5.1 provides a detailed breakdown of costs based on survey data collected for the present study.

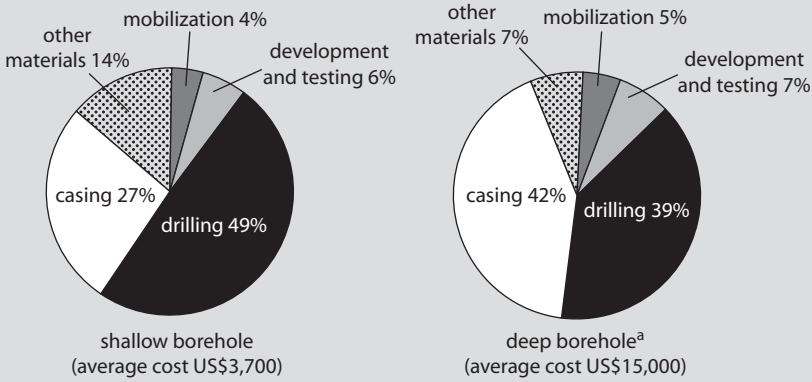
Drawing on the data for shallow boreholes, it is clear that the easiest way of saving money is to drill short. However, given that in Ethiopia a supervising hydrogeologist must, in theory, sign off on every borehole, such a scheme would require collusion between supervisor and driller. A further option would be to drill a borehole of narrower diameter than specified, although this would save less money. However, if the supervisor at does not identify the too-narrow drilling at the time, it would be difficult to identify later if the correct-diameter screens and casings were then installed.

In terms of materials, shallow wells are generally equipped with unplasticized polyvinyl chloride (uPVC) screens and casing (as seen in the cost breakdown in

(continued next page)

Box 4.5 *(continued)*

Box Figure 4.5.1 Cost Breakdown for Shallow and Deep Boreholes in Ethiopia



a. Only two deep boreholes in sample

box figure 4.5.1). This material is already some of the cheapest available (at US$15 per meter), so substitution to save money is unlikely. Other materials used in the construction of the borehole, such as washed river gravel and grout, are insignificant costwise but essential for the reliability of the borehole and to ensure a safe seal from contamination. If these materials are omitted, it is unlikely to happen on cost (and hence corruption) grounds. A likelier explanation would involve poor management in getting the materials to the site on time for construction.

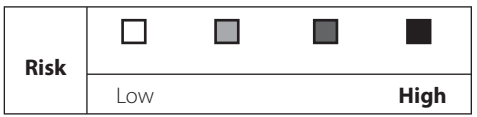
What conclusions can be drawn? For shallow wells, the most likely corrupt practice during construction is to drill short. This would allow significant savings in both drilling costs and casing material. For example, drilling to 50 m instead of 60 m would save roughly 13 percent of contracted cost, amounting to $15,000 on a contract for 30 boreholes using the cost data above. For deeper boreholes (over 60 m), although drilling short would still be the most effective way of saving money, the cost of materials is more significant.

contrast to discussions about tendering and procurement, there was broad consensus in the workshop around corruption risks in borehole construction, which validated the findings of the construction and perception surveys. In particular, areas of elevated (albeit low-to-medium) risk focused on substandard construction and, related to this, weaknesses

Table 4.4 Corruption Risk in Borehole Construction and Payment in the Ethiopian Rural Water Supply Sector

Value chain area	*Typical corrupt practices in water delivery chain*	*Risk areas evaluated by study team in Ethiopia (RWS)*	*Risk ST*	*Risk WS*
Construction and payment	• Corruption in construction: bribery and fraud, including (a) not building to specification; (b) concealing substandard work or materials; and (c) failure to complete works or underpayment of workers • Fraudulent invoicing: marked-up pricing, overbilling by suppliers • Corruption in community-based construction (with practices similar to public-private interactions)	• Contractor failure to build the specified number of boreholes	☐	☐
		• Failure to build boreholes to specification: substandard construction (e.g., not drilling to required depth, not constructing to required width, not using required quantities of equipment or materials, using substandard equipment or materials, and so on)	■	■
		• Fraudulent claims for variations to the contract (e.g., claimed payment for adverse site conditions when the conditions were OK)	■	☐
		• Collusion between contractor and site engineer to issue an extension of time or variation, with the result that the contractor gets additional payment and shares it with the site engineer	■	☐
		• Bribery by contractor of site engineer to overlook construction or performance defects	■	■
		• Extortion of payments by government officials from contractors (e.g., for approving completion reports and invoices)	■	■
		• Preferential treatment or bribery in borehole siting decisions	☐	☐

Source: Author.
Note: RWS = rural water supply. ST = study team finding. WS = workshop finding.



in oversight and sign-off procedures. Nonetheless, participants highlighted the need for a larger survey to strengthen the evidence base and the need for accurate (GPS) recording of borehole locations to ensure that inspection evidence can be linked with complete confidence to contract and invoicing documentation.

Corruption evidence: Comparing contracts, construction, and invoices. Contracts for borehole drilling in Ethiopia typically specify the depth to which boreholes should be drilled, their diameter, the likely drilling conditions, and the casing material to be used.[21] Often the type of drilling rig is also specified (as previously discussed in the "Design, Tendering, and Procurement" subsection). Typically, the responsibility for siting boreholes, supervising drilling operations, and authorizing payment for completed works rests with the regional water bureau.

The subsections below look briefly at how contract specifications compare with what was actually built (based on evidence provided by CCTV footage) and what was finally invoiced by the driller and paid for by the commissioning agency. Box 4.6 summarizes overall variance (measured versus invoiced) in the sample, focusing on three cost-weighted indicators: borehole depth, diameter, and materials. In addition, we look at the relationship between construction variance (as above), community participation in water-point implementation, and community perceptions of construction quality.

Variation between contracted specification and drilled depth. A borehole had been constructed at each of the locations the study team identified for inspection. For the 16 boreholes where an estimated depth had been specified in a contract, few (25 percent) were within 10 percent of the target: most were both measured *and* invoiced for less depth.

Given that measured depths, completion reports, and invoices for this group were consistent, the most likely reason for the discrepancy was that sufficient water was found at shallower depths and the supervisor suggested that drilling should cease before the target depth had been reached, saving time and money. This conclusion is supported by Carter et al. (2006), which found that reported completion depths in a survey of rural water supply boreholes across 14 zones in Ethiopia were often 10–20 percent lower than in the design specification, largely because tenders erred on the side of caution.

Box 4.6

Calculating Total Variance in Borehole Construction

To estimate total measured versus invoiced variance in borehole construction, three key indicators of construction standard (depth, diameter, and materials) were weighted and then combined to give an overall measure of variance. The weights assigned to each indicator were based on their relative costs, drawing on the cost data for shallow boreholes previously discussed in box 4.5.

Three scenarios were used to construct weights: (a) drilling short by 50 percent; (b) using cheap casing of 50 percent of the invoiced value; and (c) drilling a narrow diameter borehole wide enough to install casing but too narrow to accommodate gravel pack. These scenarios and cost figures give the following weights: drilling short has the highest weight (60 percent), diameter (15 percent), and materials (25 percent).

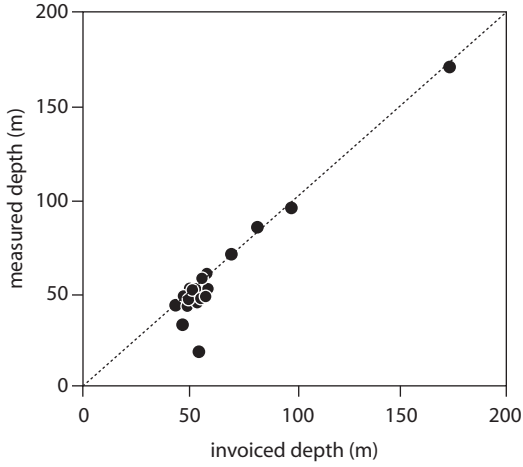
What results does this calculation produce for the current sample? The cost-weighted approach to measuring the construction-invoicing difference indicates that *10 percent of the boreholes have high variance that is likely to be caused by corrupt practices.* A further *20 percent have moderate variance* that may be the result of corruption and deliberate short-drilling but could also be caused by poor construction.

Extrapolating beyond the current survey to look at the overall investment in shallow boreholes needed to meet UAP targets (as previously shown in table 4.1), these results would imply that 2,000–6,000 shallow boreholes (10–30 percent of the 20,000 required) could be compromised over the next three years of the plan period. Using the cost breakdown previously presented in box 4.5, and assuming that each compromised borehole is drilled to 50m instead of 60 m, corruption costs attributable to short-drilling could run between US$1million and US$3 million. However, given the small sample size of the study and difficulties confirming with absolute certainty the identities of all boreholes, such projections are tentative.

Variation between drilled and invoiced depth. However, the results presented in the annex, table 4A.1, also indicate that for a significant minority of boreholes (some 35 percent), the actual measured depth was 10 percent less than that reported in the completion document and claimed in the invoice.

Figure 4.3 indicates that, for two boreholes, the difference was particularly large but that there was also a cluster of boreholes where the variance was 10–25 percent. For the entire sample, the total variance of

Figure 4.3 Measured versus Invoiced Depths in Sample Boreholes in Ethiopia



measured depth versus invoiced depth was 18 percent. Much of the variance is accounted for by one agency: an indigenous NGO using its own drilling rig, contracted by the regional water bureau.

It is conceivable that such "overshallow" boreholes have, in fact, silted up because of poor construction or difficult geological conditions. However, other observations point toward deliberate short-drilling, at least for two boreholes where both screen and pump were installed at a much shallower depth than reported in the completion certificate. For the remaining boreholes where measured depth was within 15 percent of the invoiced amount, it is more difficult to attribute variance to deliberate short-drilling and corruption.

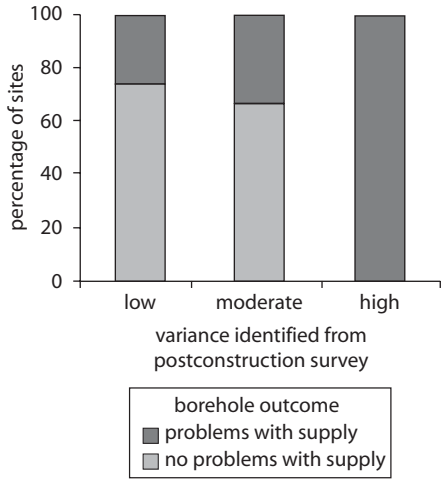
Variation in borehole diameter and materials. CCTV was also used to check whether the borehole casing had been installed. However, the process of removing the pump and rising main created significant turbidity in the borehole water, making it difficult to evaluate construction standards in detail. Instead, an attempt was made to merely observe whether casing was present above the water table. In addition, it was not always possible to measure the total length of screen in the borehole. However, because uPVC screen and casing are similar in price in Ethiopia, drillers are unlikely to economize on (normally more expensive) screen by substituting casing.

It was only possible to measure the diameter of the installed screen and casing, not the drilled diameter. In all cases, the diameter of the screen and casing was as recorded on the invoice.

Borehole outcomes: construction variance and borehole performance. Might corrupt practices in borehole construction affect the quantity, quality, and reliability of water supply? To shed light on this question, community interviewees were asked a series of questions around (a) borehole functionality, (b) seasonal variation in water availability, and (c) the perceived quality of water, including turbidity and perceived "healthiness." Responses were summarized, ranked, and equally weighted to generate the scores (shown in annex table 4A.1) and then compared with the scores for overall construction variance (measured versus invoiced), as discussed in box 4.6. Figure 4.4 shows the results.

Six of the boreholes were reported as performing poorly. Interestingly, there is an observable relationship between borehole performance and variance in borehole construction, suggesting that substandard construction has a negative impact on borehole performance, even though all of the boreholes surveyed were less than three years old.

Figure 4.4 Relationship between Construction Variance and Borehole Performance in Ethiopia



Note: "Construction variance" refers to differences between actual and invoiced construction measures. The "borehole outcome" ranking combines indicators of borehole functionality, water availability, and water quality.

Community perceptions of borehole design and construction. Villagers were also asked questions about the borehole construction process to highlight any corrupt practices around (a) site selection, (b) borehole drilling and construction, and (c) borehole payment. Several conclusions can be drawn:

- *The site selection process was regarded as fair*, with no reports of siting "bias" that might favor, for example, more influential or wealthier households. In all cases, respondents stated that siting had been carried out by "an outside expert" (a technician from the water bureau) and that drillers simply drilled at the specified location, with no input from community members.

- *Villagers had no involvement in the construction process itself*, except in one instance where villagers contributed labor to help move materials.[22] As one villager put it, "We know nothing about drilling boreholes. The drillers came, did their work, and then left." As a result, villagers had no firm views on the quality of the drilling process specifically and hence on whether the boreholes had been correctly drilled and equipped. However, some villagers did have strong views on the design and construction quality of visible headworks. Perhaps surprisingly, most criticism came from villages where community participation in project design and implementation was rated highly by the survey team (roughly half of the villages), suggesting that where communities are treated as active development partners, people are more likely to raise concerns about the quality and design of their water points, although not about the *drilling* process. Box 4.7 provides further details about the community discussions.

- *Village interviewees were adamant that no payments in cash, labor, or materials occurred between drillers and communities* except in the one instance noted above. Interviewees were unanimously clear that the drilling teams were accountable to external agencies (government or NGO) rather than to the village or the village water committee and were therefore paid by others. In most villages, community members had offered drilling teams food, drink, and in some instances shelter. In all instances, this hospitality was offered rather than solicited.

Local Management and Payment Systems

Corruption that directly involves communities and households includes situations where a householder or community leader acts as a bribe

Box 4.7

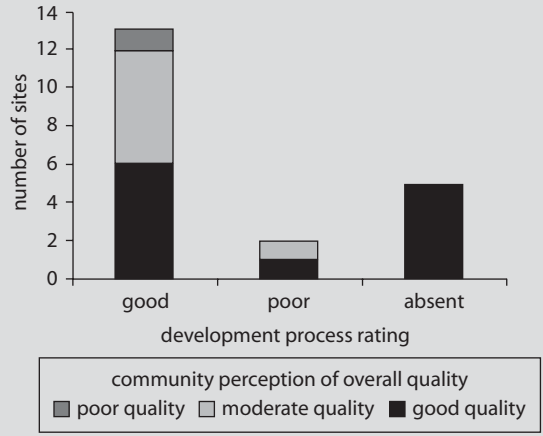
Borehole Design and Construction: What Role for Community Oversight?

Discussions with community members indicate that they have little knowledge of, let alone input into, the borehole drilling process. In most villages, the arrival of a drilling team on site is the first indication that a new water point has been planned. Drilling teams then work independently, with community support restricted to offering hospitality.

Communities did, however, express views on the quality of the headworks constructed by the drilling teams, at least in those villages where community members had been actively involved in water point planning and management (where the "development process" was rated highly). Box figure 4.7.1 shows how overall perceptions of construction quality, determined largely by views on headworks, relate to the quality of the development process followed in each village.

Box figure 4.7.2 shows a positive correlation between the construction quality of headworks rated by the survey team and community perceptions of (overall) construction quality.

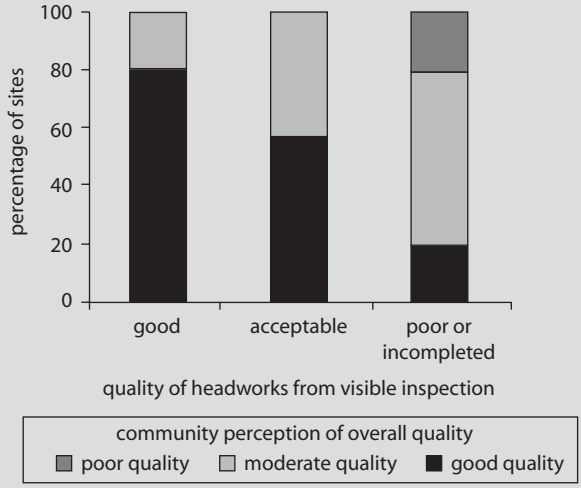
Box Figure 4.7.1 Perceptions of Ethiopian Water Point Construction Quality and Community Involvement in Project Design and Management



(continued next page)

Box 4.7 *(continued)*

Box Figure 4.7.2 Community Perceptions of Headworks Construction and Actual Construction Variance



Note: "Construction variance" refers to differences between actual and invoiced construction measures.

A general conclusion is that although communities may have strong and well-informed views on the "nondrilling," lower-cost elements of borehole construction—particularly where they have been actively involved in a project—these views do not provide a robust indicator of corrupt practice in higher-cost drilling.

giver—bribing officials to gain access to water, or water infrastructure, that might otherwise go to another village or household. Such community or household corruption might also include the embezzlement of funds by committee members in charge of collecting money for an operation and maintenance (O&M) fund or nepotism in the selection of committee members to secure kickbacks and bribes.

Evidence from rural development projects and governance assessments, within and outside the water sector, suggests that this type of petty corruption can be significant because many small transactions gradually mount up for a household or village (Plummer 2007). Moreover, broader

policy shifts toward cost recovery and user financing raise the stakes: under cost-sharing arrangements, the poor are paying for leakages caused by corruption throughout the system in the form of higher (absolute) contribution levels and higher bribes to secure (more costly) access to water (Plummer 2007).

In Ethiopia, the principle of community-based management of rural water supplies is now firmly entrenched. Under the UAP, communities are viewed as active development partners in service delivery rather than passive recipients of government aid. In this context, communities are now expected to manage and maintain their own water systems following initial support from the government, taking responsibility for collecting and managing fees. This shift raises questions about how well local contribution systems work—and, specifically, around corruption risk.

The survey team therefore asked community members questions about payment and contribution systems for the maintenance of water points, focusing on contribution levels, procedures, and outcomes. In addition, other stakeholders in regional bureaus, NGOs, and donor agencies were canvassed. In summary, the survey team found the following:

- In all of the villages surveyed, water and sanitation committees had been established. However, the quality of the mobilization and management process differed markedly. Only in those projects funded by the World Bank WASH program or implemented by NGOs were expressions of demand for improved supplies actively sought by project-implementing agencies in the form of up-front contributions to capital costs, the opening of a bank account, and the formation of committees prior to borehole construction.

- In those villages where the development process was rated highly (WASH program and NGO), contribution systems appeared to be much more robust and rules-based. That said, none of the users interviewed during the course of the survey voiced concerns about the embezzlement of fees (typically amounting to Br 1 to Br 2 per month per household) by those responsible for collection, banking, and spending. In each village, contributions were collected and periodically banked.

- In contrast, interviews conducted with those outside the community identified embezzlement of funds and "interference" in user group formation as serious issues. Examples of corrupt practices cited included

(a) interference in the selection of committee members by powerful village members; (b) nomination of noncommittee members for training; (c) failure to bank all of the money collected from users; and (d) unauthorized withdrawal and theft of funds by committee members. Interference in committee selection and hence training has a financial implication because those attending courses receive an allowance.

A general conclusion is that although our survey did not highlight evidence of corrupt practice in local payment systems,[23] there are clear risks—particularly in larger schemes, where banks are distant, where money is left in the care of individuals for long periods of time, and where woreda officials find it difficult to keep tabs on community-held funds. Partly as a response to these risks, civil society organizations have lobbied government to grant WUAs legal status through a Proclamation on the Establishment of Rural Water Users' Associations (see box 4.8), under a task force coordinated by the MOWR. One of the key aims is to reduce the risk of local, village-level corruption.

Box 4.8

Proclamation on the Establishment of Rural Water Users' Associations

Although household contributions to local O&M funds are small (Br 1 to Br 2 per month), combined funds can quickly add up. A village of 500 households, for example, would contribute Br 6,000 to Br 12,000 over the course of a year. Funds should be deposited regularly in a bank account, but where banks are difficult to reach, cash is often kept in the house of a committee member. Moreover, although woreda officials are supposed to authorize the opening of a WUA bank account and are responsible for investigating any reports of misuse, the job is a difficult one, especially when there are repeated changes in committee membership. Over time, woreda oversight becomes weaker.

NGOs that work with communities on a long-term basis are more aware than most of the opportunities that local oversight creates for the misappropriation of funds. One NGO staff member interviewed reported how a committee member had disappeared with more than Br 15,000 from a large village project—a major

(continued next page)

Box 4.8 *(continued)*

setback for both the NGO and the community. In 2005, three NGOs actively involved in the promotion of community management of water supplies commissioned a report on the legal aspects of WUA formation and management, arguing that legal status would help prevent the mismanagement of funds because money collected from community members would no longer be in the care of individuals but held in the name of a legal entity.

In 2006, a consultative and validation workshop was held by the NGOs, the MOWR, regional water bureaus, and other stakeholders to discuss the issue. A national task force was set up under the authority of the minister, and a consultant was hired to prepare a generic proclamation and implementation guideline. The proclamation is currently being adapted and adopted in a number of different regions.

Sources: Study team interviews and RiPPLE 2008.

Summary and Recommendations

In view of the scale of investment required in rural water supply in Ethiopia and its importance in reducing poverty, ensuring that service delivery is efficient, corruption-free, and reaches the poor is a clear priority. The risks are potentially high: internationally, the water sector is viewed as "high-risk" for corruption because of the financial flows involved, weak government oversight, and significant public-private interactions. In Ethiopia (as elsewhere), however, there is little concrete evidence of specific risks or about the effectiveness of different interventions that might reduce those risks.

To address this gap, the current study has reviewed both evidence and perceptions of corruption in the provision of rural water supply in Ethiopia through a mix of field surveys and interviews with sector stakeholders. The study has drawn on a framework that helps focus on corruption, in various forms, through a value chain, with the aim of identifying risk points and mitigation measures.

One of the study's major conclusions, broadly speaking, is that Ethiopia has made significant strides in policy development, financing, governance, and management, resulting in *generally low levels of corruption and perceptions of corruption along the value chain*. That said, the study has also highlighted a number of vulnerable areas, particularly at the lower

(procurement and construction) end of the value chain, and stakeholder perceptions vary in some instances. Moreover, given Ethiopia's experience with decentralization, there may be significant *regional* variation in corruption risk.

The 10 recommendations below—focused on how to reduce risks and strengthen accountabilities—are aimed primarily at federal and regional governments.

Policy Making and Regulation

Available evidence—and the perceptions of government, donor, civil society, and private sector stakeholders—indicates that corruption risk in the policy and regulation area of the value chain is low. For example, few opportunities for rent seeking at the policy-making level appear to exist for politicians because funding mechanisms and prioritization are systematized, reasonably transparent, and rules-based. Nonetheless, it is clear that knowledge of and adherence to sector policies vary by region: established regions such as Oromia enjoy a better reputation for good governance and low corruption (at this and other levels of the value chain) than others.

Sector stakeholders identified three particular areas of concern:

- The privileged position of state-owned drilling enterprises in borehole construction
- Licensing procedures for private drilling companies
- The cost-effectiveness of drilling operations generally.

In each case, however, concerns relate more to governance and efficiency than to corruption per se. State drilling capacity has been retained and strengthened, providing government with capacity to operate in remote areas or emergencies when risks may be too high for private contractors. Nonetheless, SOEs are also engaged in routine drilling works, and in some instances reportedly subcontract surplus work to the private sector. The circumstances under which SOEs bid for work or are sole-sourced (and subcontract to others) remain somewhat opaque, creating the perception (at least for some stakeholders) of malpractice.

Recommendation 1: *Clarify the position of SOEs and restrict their operations to high-risk situations.*

The position of regional drilling enterprises in the drilling market requires clarification. In particular—to reduce perceptions of malpractice or unfair

competition and to increase confidence in tendering and procurement more generally—the federal government should clarify the circumstances and procedures for contracting SOEs. In a competitive market with many different drilling companies, the role of an SOE should be as a "driller of last resort."

Concerns about licensing focus on generating healthy competition and competitive pricing in the drilling sector. An argument by some stakeholders was that the current (onerous) licensing requirements are prohibitive for new entrants to the market, in effect creating a smallish, closed shop in which SOEs inflate the costs.

Recommendation 2: *Lower the entry barriers for private contractors.*

A relaxation in current licensing requirements would encourage new entrants into the market (particularly from within Ethiopia) and encourage greater competition. Measures could include accepting leasing arrangements (rather than outright ownership) for rigs and trucks and facilitating credit for start-up enterprises.

Recommendation 3: *Commission an independent study of the efficiency and effectiveness of state-owned drilling companies*.

The study should include a detailed breakdown and analysis of drilling costs for both shallow and deep boreholes under different contracts and in different areas.

Planning, Budgeting, and Transfers

There have been major changes in sector planning, budgeting, and transfers in Ethiopia over recent years, but both evidence and perceptions suggest that the corruption risk in these areas is generally low. With respect to planning, for example, low-cost technologies that can be part-financed and maintained by local communities are favored under the UAP, recognizing the need to adapt service delivery choices to the circumstances of the poor instead of to, say, the "big-project, high-tech" wishes of contractors.

In terms of sector budgeting and fiscal transfers, the shift toward general budget support and decentralization does not appear to have created new or significant forms of corruption. For example, the allocation of block grants is transparent and formula-based; the growing multidonor pooled fund is similarly disbursed (and in this case ring-fenced) according to strict criteria; and the remaining off-budget, project-based investment appears to be tightly controlled, albeit through a variety of different organizations and accounting procedures.

What of political and administrative decentralization? Does this carry the risk of devolving money and power to tiers of government where oversight and accountability remain weak? A conclusion from our study is that although it makes sense for woredas to support self-supply and other low-end technologies (spring protection, for example), there are sound reasons for retaining borehole planning and procurement at regional or zonal levels, in part to reduce corruption risk.

Recommendation 4: *Retain borehole planning and procurement responsibilities at regional or zonal levels.*

Decentralization policy raises the question of which tasks and responsibilities should be retained and which should be devolved. There are sound technical, economic, and anticorruption-related arguments for retaining borehole planning and procurement at regional or zonal levels. This is where core expertise exists, where economies of scale can be found in the "batching" of contracts, and where government oversight and supervision probably work best, albeit with some reservations, as specified below.

Recommendation 5: *Improve the quality and accessibility of monitoring data about rural water supply investment, infrastructure, and functionality.*

One area that sector stakeholders singled out for attention was weak monitoring and evaluation, which includes several elements:

- Infrastructure inventories do not link schemes to financing modalities, making attribution difficult.
- Infrastructure inventories themselves are inadequate or fragmented among different stakeholders at different levels, making it difficult to know what has been built where. (One of the major obstacles faced in the postconstruction survey was compiling information on boreholes—from initial contract documents to site locations and final completion reports).
- Information systems for monitoring access to water—beyond theoretical coverage—remain inadequate despite being vital to support planning and to guide the allocation of funds. Significant distortions in the reporting of access to water occur at different levels of government, leading to perceptions of corruption as figures are inflated for political ends.

Taken together, these weaknesses are perceived as contributors to corruption risk by making it difficult (for government and for donors) to link

investment with infrastructure and outcomes. Efforts under way to roll out a national WASH inventory should go some way toward addressing these problems.

In contrast to many developing countries, monitoring and information systems for tracking spending and progress in rural water supply at least exist in Ethiopia. However, their quality and accessibility could be significantly improved. In particular, there is an urgent need to compile accurate inventories of rural water supply (and sanitation) infrastructure funded through different channels and to increase confidence (and reduce *perceptions* of corruption) in coverage data.

Tendering and Procurement

In contrast to other areas of the value chain, there was no general consensus among stakeholders about corruption risk in tendering and procurement. In particular, although serving government staff and drilling companies expressed confidence in the process—noting that the sheer demand for drilling services makes corruption rather pointless—other stakeholders were more critical. That said, none of the stakeholders interviewed was able or prepared to cite recent cases of corruption in the rural water supply sector—although examples of how the process *could* be manipulated were readily provided. A tentative conclusion is that recent changes in process and procedure have reduced opportunities for corrupt practice and that the current demand for drilling services, coupled with a reasonably competitive drilling market, also mitigates risk, though perceptions vary.

Where are the remaining vulnerabilities, and how could they be addressed? A key finding from the study is that tendering and procurement records are not easy to find and check. In theory, information should be available from the regional bureaus that commission, oversee, and approve work. Regional and zonal bureaus should also compile and use well completion reports, not only as a check on what has been built and where but also to inform future contract design. In practice, records are sometimes incomplete or lodged with different levels of government, and archived data are lost or inaccessible.

Recommendation 6: *Strengthen record-keeping procedures in regional and zonal bureaus, providing clear guidelines for the compilation and use of well completion reports and contract information.*

Regional and zonal water bureaus responsible for commissioning, overseeing, and approving borehole construction should compile and maintain complete file copies of contracts, design specifications, completion

reports, and invoices. Drilling contractors should submit well completion reports (including the GPS coordinates of completed boreholes) to bureaus as a matter of routine and as a prerequisite for payment.

Recommendation 7: *Increase the transparency of the tendering and procurement process through a public disclosure program.*

A broader point concerns transparency and access to the information compiled on tendering and procurement. To date, efforts to curb corruption in this area have been largely prescriptive—establishing better rules and procedures for tendering and bid evaluation, for example. However, steps can also be taken to increase the transparency of tendering and procurement, creating opportunities for public scrutiny of tender documentation, evaluation reports, overall costs, and unit rates. Experience from other countries indicates that greater transparency and access to information can change the behavior of public officials and private contractors, increase the probability of detection, and generate *demand* for accountability.

Information relating to the tendering process and outcomes should be made available for public scrutiny. There are various ways of doing this, and lessons can be learned from the experience in other countries. One approach would be to present records online through a contracts portal on the ministry website.

Construction, Operation, and Payment

The postconstruction technical and perception surveys conducted for this study have proved useful in identifying corrupt practices in borehole construction. The cost-weighted comparison of design specifications, measured construction parameters, and invoices indicates *probable* corrupt practice in 10 percent of the sample through short-drilling. A further 20 percent showed moderate variance that *could* be caused by deliberate short-drilling but could also result from other factors. Most boreholes—the remaining 70 percent of the sample—had been properly constructed and were functioning well. Although international comparisons should be treated with caution and data are limited, the costs of borehole construction (albeit from a small sample) *appear* comparable with those found in other African countries.

Extrapolating beyond the current survey to look at the total number of shallow drinking-water boreholes needed to meet UAP targets, this finding would imply that 2,000–6,000 shallow boreholes could be compromised over the next three years. Using sample cost data, and assuming

each compromised borehole is drilled to 50 m instead of 60 m, corruption costs attributable to short-drilling of could total between US$1 million and US$3 million. There may be other costs, too: survey results suggest that corrupt practices in construction affect borehole performance and hence people's access to improved water supplies. Projections should be treated with caution, however, because the sample size was small and the identity of some village boreholes (and hence links to contracts, borehole logs, and invoices) could not be confirmed with complete confidence in the absence of GPS coordinates.

Beneath the headline numbers, what key conclusions and recommendations emerge from the borehole story? To begin with, the study highlights the importance of understanding borehole construction costs as a means of identifying likely corrupt practice. Our analysis of borehole costs indicates that the most likely corrupt practice during the construction of *shallow* boreholes is to drill short, generating significant savings in both drilling and materials. Depth can be measured with the CCTV equipment used for the current study, but it could also be measured using a simple measuring line by government staff or by communities themselves. For *deeper* boreholes (those > 60 m) the cost of materials is more significant, and use of CCTV would be the only way of assessing both depth and the correct use of casing and screen.

Recommendation 8: *Adopt the survey approach piloted in this study to monitor, and improve, construction standards in borehole drilling and to deter future corruption.*

For shallow boreholes, the critical indicator of corrupt practice is drilled depth; this can be measured in a number of ways. For deeper boreholes, it is more important to use CCTV equipment to assess both depth and the use and quality of materials. In both cases, spot checks on construction, as well as the announcement that checks might be made, could provide a powerful means of reducing corruption risk.

Recommendation 9: *Strengthen on-site supervision of drilling contractors by government personnel.*

We note that procedures are already in place for monitoring construction standards through on-site supervision of contractors by regional or zonal hydrogeologists. However, staff members are few in number and often hard pressed to monitor the numbers of boreholes being constructed in rural areas.

Appropriate monitoring can be achieved by increasing of the number of regional and zonal staff assigned to monitoring duties and by ensuring they receive the training necessary to spot deliberate malpractice with respect to short-drilling and use of substandard materials.

Recommendation 10: *Strengthen community oversight and monitoring of headwork construction in parallel with government supervision of drilling.*

Finally, study findings suggest that community perceptions of construction are determined largely by the quality of borehole headworks, at least in those villages where communities have been actively involved in project planning and management. However, perceptions alone do not provide a robust indicator of corrupt practice in drilling—the part of construction that is most vulnerable to corruption but that community members know least about.

For this reason, we conclude that the potential for community oversight of construction as a means of reducing corruption risk is limited but that opportunities do exist for improving accountability in the design and quality of headworks. The most effective way of achieving this is to ensure that communities can make informed choices about the pump they want and about any additional water uses (such as for livestock) that need to be factored into final design.

It is good practice to ensure that communities have a say in the design of surface headworks and, where feasible, in the siting of a borehole. However, although community monitoring may improve project outcomes, it is unlikely to affect corrupt *drilling* practices. Community oversight of drilling is unrealistic; this should remain a government responsibility.

Annex 4.1 Ethiopian RWS Borehole Study and Perception Survey Results

Table 4A.1 Summary of Ethiopian RWS Borehole Construction Variance Study and Perception Survey Results

Site information			*Depth information*			*Variance*				*Final scores*			
Site	*Woreda*	*Driller*	*Suggested depth in specification (meters)*	*Actual depth from survey (meters)*	*Depth invoiced (meters)*	*Depth invoiced compared to actual depth (percentage)*	*Actual depth compared to specified depth (percentage)*	*Material type invoiced compared to actual*	*Diameter invoiced compared to actual (percentage)*	*Post-construction survey variance[a]*	*Borehole outcomes[b]*	*community perception of construction standards[c]*	*community development process[d]*
0	Omo Nada	Private driller	70	70.0	70	0	0	L	0	low			
1	Omo Nada	Private driller	60								excellent	good	poor
2	Sokoro	Private driller	60	52.5	60	15	–13	L	0	low	excellent	good	poor
3	Kersa	Regional enterprise		146.0		3			0	low		moderate	good
4	Amaya	NGO	60	18.5	55	197	–69	M	0	high	problems	good	good
5	Amaya	Private driller	50	52.0	60	15	4	L	0	low	problems	good	good
6	Amaya	NGO	60	44.8	54	21	–25	L	0	moderate	excellent	good	poor
7	Amaya	Private driller		47.4	57	20		L	0	moderate	problems	good	good
8	Nanno										failing	moderate	good
9	Goru	Private driller	60	58.0	57	–2	–3	L	0	low	excellent	poor	good
10	Amaya	NGO	60	32.4	47	45	–46	L	0	high	problems	good	poor
11	Amaya	NGO	60	42.9	50	17	–29	L	0	moderate	excellent	good	good
12	Amaya	Private driller	50	52.3	54	3	5	L	0	low	problems	moderate	good

13	Goru	Private Driller	60	46.5	50	8	–23	L	0	low	excellent	moderate	good
14	Goru	Private Driller	60	51.5	53	3	–14	L	0	low	excellent	moderate	good
15	Goru	Private Driller	60	47.6	60	26	–21	L	0	moderate	excellent	moderate	good
16	Shebedino	Regional Enterprise		53.0	52	–2		L	0	low	problems	good	
17	Shebedino	Private Driller		121.5						low			
18	Shebedino	Regional Enterprise		42.7	44	3		L	0	low	excellent	good	moderate
19	Dale	Private Driller	150	95.0	99	4	–37	L	0	low		good	
20	Dale			50.4						low	problems	good	good
21	Dale	Private Driller	150	145+	174	5	10	L	0	low		good	
22	Gedebe	Regional Enterprise		48.4	49	1		L	0	low	excellent	good	good
23	Abeshgehu	Private Driller	70	60.6	60	–1	–13	L	0	low	excellent	moderate	moderate
24	Abeshgehu	Private Driller	70	84.1	83	–2	20	L	0	low			
25	Abeshgehu	Private Driller									excellent	moderate	poor

Source: xxxxx

Note: RWS = rural water supply. NGO = nongovernmental organization.

a. Score based on a weight of depth, diameter, and materials variance of 60%, 15%, and 25% respectively, according to cost.

b. Score based on even weight of answers to survey questions on functionality, seasonal quantity, and quality (turbidity) of water.

c. Score based on even weight of answers to questions on borehole location, construction, and payment.

d. Score based on even weight of answers to questions on community participation, management arrangements, and contributions.

Notes

1. The provision of basic drinking water is of direct relevance to the rural poor. However, an assessment of corruption risk in hydropower, irrigation, and urban water supply—where contract values are higher—was beyond the purview of the current study.
2. The Millennium Development Goal for water is to halve those without access by 2015.
3. Grey and Sadoff (2007), citing a World Bank study (2006b), highlight two key challenges: First, Ethiopia lacks the water resources infrastructure and institutions to mitigate hydrological variability directly. For example, Ethiopia has less than 1 percent of the reservoir storage capacity per capita of North America to buffer its hydrological variability. Second, it lacks the market infrastructure that might help mitigate the economic impacts of variability by facilitating agricultural trade between affected and unaffected areas.
4. Between 2002 and 2005, total access to potable water increased from 30 percent to 42 percent.
5. The Gilgel Gibe III hydroelectric dam, Ethiopia's largest infrastructure project to date, will more than double the country's electricity generation capacity, provide much-needed water storage, and reduce flooding in downstream areas. However, the US$2 billion dam has attracted significant controversy over its environmental and social impacts as well as the procedures followed by the African Development Bank in assessing them.
6. Estimates from other sources also show considerable gains, though the level of increase is more modest: the WHO-UNICEF Joint Monitoring Program (JMP) (2008) reports that 31 percent of the rural population use water from improved sources (protected wells and springs or piped systems) as their main source of drinking water. (Government figures are based on theoretical access, regardless of functionality; WHO-JMP figures measure actual use of improved sources.)
7. The effective exchange rate is that used in the World Bank Public Finance Review (2009): US$1 = Br 11.06.
8. The Public Finance Review (World Bank 2009) singles out for blame the parallel accounting systems imposed by financial partners, noting that modalities with low annual utilization rates (as low as 27 percent for African Development Bank projects) had set up parallel procedures that centralized control of decentralized service delivery, particularly for accounting and procurement.
9. See JTR 2008.
10. Lack of knowledge about federal policies at lower levels of government is a widely acknowledged problem.

11. Although decentralization is giving lower tiers of government new rights and responsibilities, government policy also takes into account the economies of scale present in tendering higher levels of technology to higher levels of government. Hence for borehole drilling, where it makes sense to batch or package contracts rather than tender one at a time, regional and zonal staff will retain contracting and oversight responsibilities (World Bank 2009).
12. The criticisms relate to both the technology itself and the government's motives in promoting it. Concerns around the former relate to water quality and reliability from sources regarded as "unprotected" (WHO-UNICEF 2008) and more sensitive to variations in rainfall. Hence some have argued that that the government's primary motive in promoting self-supply relates to cost and speed rather than provision of *secure* water.
13. Government and donor funding for rural water supply flows through three channels: C*hannel 1* is "on-budget" and "on-treasury," with funds allocated through the government's core budget and expenditure system (through MOFED and the regional [Bureaus of Financial and Economic Development] and woreda [Woreda Offices of Finance and Economic Development] offices of finance and economic development) and allocated to regions through block grants. C*hannel 2* funds are made available direct to the MOWR and transferred down through line departments. As such, they are on-budget but off-treasury. C*hannel 3* resources are allocated directly to implementers and service providers, with funding from some bilateral donors and NGOs. These funds are therefore off-budget and off-treasury. A new channel (C*hannel 1b*) has recently been created to pool donor and government funds for sectorwide WASH. This money is managed by the finance ministry and bureaus (and is therefore on-budget and on-treasury) through a cascade of special accounts at federal, regional, and woreda levels.
14. Supplementary to sector-specific funding, the Ministry of Agriculture and Rural Development manages two related special-purpose grants through its Food Security Commission: the Food Security Program and the Productive Safety Nets Program. These are managed outside the core government budget and expenditure management system through Channel 2. Because these programs are intended to smooth household income fluctuations through "food for work" and other activities, they do not focus on borehole drilling and were not examined in detail by the study team.
15. Draft guidelines for national WASH monitoring and evaluation were published and discussed at the October 2009 multistakeholder forum.
16. In SNNPR, for example, data on access to WASH services has been highly contested because of differences between aggregated results at the regional level and variations in underlying woreda and zonal data. Disputes have arisen between some woredas and zones about the level of water supply coverage, creating difficulties in budget allocation. The regional water bureau in SNNPR has now established a task force to generate a consistent dataset.

17. "Guidelines on Procurement under IBRD Loans and IDA Credits" (May 2004, revised 2006) and "Guidelines for Selection and Employment of Consultants by World Bank Borrowers" (2004, updated 2006).
18. The workshop group that was asked to validate the study team's findings was dominated by serving government staff.
19. Sample size was restricted to 26 boreholes, although CCTV measurement was limited to 23 boreholes, and invoices *and* CCTV measurements could be obtained for only 20 boreholes. The sample was limited because (a) gathering the background information needed (namely, contract documents, well completion reports, and invoices) to identify sites and evaluate performance proved difficult, with the data fragmented among drilling companies, regional and zonal bureaus, and NGOs; (b) finding sites in the field was not always easy without global positioning system (GPS) coordinates; and (c) preparing each borehole for CCTV filming was time-consuming. In particular, the hand pump and rising main had to be removed before the camera could be lowered down the borehole. The process could take up to one day depending on distance traveled and technical difficulty. The survey focused on shallow boreholes equipped with hand pumps rather than deeper boreholes. This focus reflects the importance of shallow wells to the UAP target (see table 4.1) and the need to pilot the CCTV survey method at shallower depths.
20. Drilling costs in India, for example, are typically less than one-tenth of those in Sub-Saharan Africa, but there may be good reasons for such differences (distances involved, the state of road networks, drilling conditions, and so on). Hence Carter (2006) cautions against simplistic international comparisons.
21. Contracts are not employed for drilling programs when drilling is commissioned and conducted by one of the state-owned drilling enterprises or when an NGO drills boreholes with its own rig. In the current survey, four boreholes commissioned and drilled by regional enterprises were not formally contracted.
22. In this village, the drilling team reportedly asked village elders to organize help with the transport of materials and equipment to the borehole site on the understanding that labor would be paid. However, the drilling team left without making any payments. None of the contracts or invoices viewed by the survey team included provision for local (contractor to village) payments.
23. In each of the surveyed villages, discussions on contribution systems for water-point operation and maintenance were held with committee members and ordinary water users. Although malpractice was not reported, comprehensive checks on local accounts were not possible in the time available.

References

Adekile, D., and O. Olabode. 2009. "Study of Public and Private Borehole Drilling in Nigeria." Final report for the WASH (Water, Sanitation, and Hygiene) Section, United Nations Children's Fund (UNICEF) Nigeria, Abuja.

Ball, D. 2009. "Ethiopia: CCTV Well Field Review 2009." Report CR/09/080 for the British Geological Survey, Keyworth, Nottingham, U.K.

Ball, P. 2004. "Solutions for Reducing Borehole Costs in Rural Africa." Water and Sanitation Program, Rural Water Supply Network (RWSN) and SKAT Foundation Field Note, RWSN, St. Gallen, Switzerland.

Calow, R. C., A. M. MacDonald, A. L. Nicol, and N. S. Robins. 2010. "Ground Water Security and Drought in Africa: Linking Availability, Access, and Demand." *Ground Water* 48 (2): 246–56.

Campos, J. Edgardo, and Sanjay Pradhan, eds. 2007. *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level*. Washington, DC: World Bank.

Carter, R. 2006. "Ten-Step Guide Toward Cost-Effective Boreholes: Case Study of Drilling Costs in Ethiopia." Rural Water Supply Series Field Note, Water and Sanitation Program, Rural Water Supply Network, St. Gallen, Switzerland.

Carter, R. C. H., Desta, B Etsegenet, B. Eyob, D. Eyob, N Yetnayet, M. Belete, and K. Danert. 2006. "Drilling for Water in Ethiopia: A Country Case Study by the Cost-Effective Boreholes Flagship of the Rural Water Supply Network." Final Report, Volume 1—Main Report of the Water and Sanitation Program, World Bank, Washington, DC; Rural Water Supply Network, St. Gallen, Switzerland; and Ethiopian Ministry of Water Resources, Addis Ababa.

Davis, J. 2004. "Corruption in Public Service Delivery: Experience from South Asia's Water and Sanitation Sector." *World Development* 32 (1): 53–71.

Estache, A., and E. Kouassi. 2002. "Sector Organisation, Governance, and the Inefficiency of African Water Utilities." Policy Research Working Paper 2890, World Bank, Washington, DC.

Foster, S. S. D., A. Tuinhof, and H. Garduno. 2008. "Groundwater in Sub-Saharan Africa: A Strategic Overview of Development Issues." In *Applied Groundwater Studies in Africa: IAH Special Publications in Hydrogeology, volume 13*, ed. S. Adelana and A. M. MacDonald, 9–21. Leiden, Netherlands: CRC Press.

Grey, D., and C. W. Sadoff. 2007. "Sink or Swim? Water Security for Growth and Development." *Water Policy* 9 (6): 547–71.

Halpern, J., C. Kenny, E. Dickson, D. Ehrhardt, and C. Oliver. 2008. "Deterring Corruption and Improving Governance in the Urban Water Supply & Sanitation Sector: A Sourcebook." Water Working Note 18, World Bank, Washington, DC.

JTR (Joint Technical Review). 2008. "Joint Technical Review Report and Agreed Actions." Submission discussed and agreed at June 27, World Bank, Washington, DC.

Klitgaard, R. 1998. *Controlling Corruption*. Berkeley: University of California Press.

Kolstad, I. 2005. "Direct Budget Support and Corruption." U4 Issue 1, U4 Anti-Corruption Resource Centre, Chr. Michelsen Institute, Bergen, Norway.

MacDonald, A. J. Davies, R. Calow, and J. Chilton, J. 2005. *Developing Groundwater: A Guide for Rural Water Supply*. Rugby, U.K.: Practical Action Publishing.

MOWR (Ministry of Water Resources). 2008. "Reformulation of Strategies and Plans for an Accelerated Implementation of the UAP for Rural Water Supply." Draft of Main Report, Volume 1, by the Task Force for UAP Review, Government of Ethiopia, Ministry of Water Resources, Addis Ababa.

Plummer, J. 2007. "Making Anti-Corruption Approaches Work for the Poor: Issues for Consideration in the Development of Pro-Poor Anti-Corruption Strategies in Water Services and Irrigation." Report 22, Swedish Water House, SIWI (Stockholm International Water Institute), and WIN (Water Integrity Network), Stockholm.

Plummer, J., and P. Cross. 2007. "Tackling Corruption in the Water and Sanitation Sector in Africa: Starting the Dialogue." In *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level Campos*, ed. J. E. Campos and S. Pradhan, 221–63. Washington, DC: World Bank.

RiPPLE (Research-inspired Policy and Practice Learning in Ethiopia and the Nile Region). 2008. "Policy Engagement Strategy for the RiPPLE Research Program Consortium." Draft report, Addis Ababa.

Rose-Ackerman, S. 1999. "Corruption and Government: Causes., Consequences, and Reform." New York: Cambridge University Press.

TI (Transparency International). 2005. *Global Corruption Report 2005: Corruption in Construction and Post-Conflict Reconstruction*. Cambridge: Cambridge University Press.

———. 2008. *Global Corruption Report 2008: Corruption in the Water Sector*. Cambridge: Cambridge University Press.

WHO and UNICEF (World Health Organization and the United Nations Children's Fund). 2008. "Progress on Drinking Water and Sanitation 2008: Special Focus on Sanitation." Update report of the Joint Monitoring Program for Water Supply and Sanitation, UNICEF, New York, and WHO, Geneva.

Woodhouse, A. 2002. "Combating Corruption in Indonesia: Enhancing Accountability for Development." East Asia Poverty Reduction and Economic Management Unit, World Bank, Washington, DC.

World Bank. 2006. "Ethiopia: Managing Water Resources to Maximise Sustainable Growth." A Country Water Resources Assistance Strategy report, World Bank, Washington DC.

———. 2009. "Ethiopia Public Finance Review." Report 50278-ET, Poverty Reduction and Economic Management Unit, Africa Region, World Bank, Washington, DC.