Corruption in Public Service Delivery: Experience from South Asia's Water and Sanitation Sector

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Summary. — This paper presents empirical information regarding the types and magnitude of corrupt behaviors documented in water supply and sanitation service provision in several South Asian localities. It also examines the strengths and weaknesses of current strategies to reduce corruption among several public water and sanitation bureaucracies in South Asia, drawing on interviews and focus group discussions with more than 1,400 staff, customers, and key informants. Where corruption has been reduced, two concomitant drivers are observed: a shift in the accountability networks of service providers, and a change in the work environment that increases the moral cost of misconduct.
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1. INTRODUCTION

Among the many challenges facing public service institutions in developing countries, corruption remains one of the most pervasive and the least confronted. [1] Historically, donor agencies and their clients accepted the inevitability of corruption in public service delivery; it was at worst a necessary evil and at best the "grease" essential to move the wheels of economic development (Lui, 1985). In recent years, however, consensus has emerged that corruption is a central challenge to equitable and sustainable development. A growing body of research suggests that corruption and rent-seeking shrink the range of opportunities available to developing countries as investments become less productive, the cost of capital increases, and private investment, foreign direct investment, and foreign aid all decline (Mauro, 1995; Tanzi & Davoodi, 1997; Wei, 1999). Donors are increasingly sponsoring research on corruption (including in their own projects), and many have created units dedicated to providing assistance to developing countries for assessing and responding to corruption-related problems. [2]

Many of these research and support activities, however, are not very helpful to individuals working on public service reform at the organizational level. Whereas curbing corruption requires understanding and action at both the policy and the institutional levels, most research and advice focuses on the former. Anti-corruption programs sponsored by development agencies emphasize macro-level initiatives such as economic and sector policy reforms (e.g., liberalizing trade and reducing subsidies) and transformation of critical institutions such as the judiciary (Kaufmann, 1998; OECD, 1999; World Bank, 1997). Large-scale

reforms are, of course, critical in reducing corruption, but they also require time and considerable political will to implement (DiIulio, Garvey, & Kettl, 1993). Much of the anti-corruption advice at the organizational level, however, implicitly assumes that a backdrop of such macro-reforms is in place. The result is a set of recommendations drawn from "New Public Management (NPM)" tenets that are generally infeasible in the highly constrained institutional environment of many developing countries (Hood, 1991). [3]

With this paper I hope to contribute to a relatively small empirical literature on corruption within public-service institutions in developing countries using data from several water and sanitation (W&S) service providers in South Asia. The South Asia region is home to more than 200 million people lacking access to safe drinking water and 800 million without proper sanitation service; faces some of the lowest per-capita freshwater availability in the world; and also includes several countries ranked in the lower quartile of Transparency International's Corruption Index (2001). Anecdotal information suggests that rent-seeking and corruption in W&S service delivery in South Asia are widespread, yet little empirical evidence has been collected on the character or magnitude of the problem, much less on the effectiveness of efforts to address it. [4]

The goal of this research was not to compile an exposé on corruption among South Asian water and sanitation service providers. On the contrary, the public institutions we studied were considered by sector and regional experts to have made strides in improving responsiveness and accountability to customers. [5] At the same time, none of these institutions had initiated a program or policy to confront issues of transparency and corruption directly. None had pursued actions with the stated goal of reducing rent-seeking, although many did, in fact, have this effect. Thus, while corruption has appeared on the reform agenda of many development organizations and developing country governments, it was not a focus of any of these "best practice" cases.

Given this environment, it is no surprise that obtaining reliable information about corruption was exceedingly challenging. The information provided in this paper was obtained from more than 350 staff and 730 customer interviews in both urban and rural contexts, as well as from meetings with more than 320 elected officials, researchers, activists, journalists, and development professionals in South Asia. [6] The findings presented here are pooled from data collection activities carried out in the nine institutions summarized in Table 1. In most cases respondents were not randomly selected, meaning that the findings presented here should be viewed as illustrative rather than generalizable. Details of the data collection strategies we employed are provided in Appendix A.

When questioning public agency staff and customers, interviewers used carefully designed

Table 1. *Case summaries*

Location	Institution(s)	Institutional form(s)
Chennai, Tamil Nadu, India	Chennai Metropolitan Water Supply & Sewerage Board	Water Board (urban)
Bangalore, Karnataka, India	Bangalore Metropolitan Water Supply & Sewerage Board	Water Board (urban)
New Delhi, India	Delhi Jal Board	Water Board (urban)
State of Tamil Nadu, India	Tamil Nadu Water Supply & Drainage Board, Tamil Nadu, India	State Water and Drainage Board (rural and small town)
State of Kerala, India	Kerala Water Authority	State Water and Sanitation Board (urban and rural)
Hyderabad, Andhra Pradesh, India	Hyderabad Metropolitan Water Supply & Sewerage Board	Water Board (urban)
Ahmedabad, Gujarat, India	Ahmedabad Municipal Corporation	Municipal Corporation (urban)
State of Kerala, India	Gram Panchayats	Local Government (rural)
Azad and Jammu Kashmir, Pakistan	Local Government & Rural Development Department, Azad and Jammu Kashmir	State Rural Development Department

and pre-tested questionnaires that placed sensitive questions toward the end of roughly one-hour sessions. Respondents thus had an opportunity to develop rapport with interviewers before being asked about corruption-related issues. At the same time, debriefing exercises with our interviewers suggest that a proportion of respondents were visibly uncomfortable answering questions about corruption and may have understated the occurrence of such behaviors. Rather than second-guess the veracity of respondents' answers, I present the raw data as collected, noting that these are likely conservative estimates of the incidence of such practices. In addition, to protect the identity of respondents I have, in many instances, restricted my comments to "urban" or "rural" settings, and occasionally to a particular institutional form (e.g., municipal corporation).

Following this introduction, Sections 2–5 of the paper present empirical data to document the types and extent of corruption in the water supply and sanitation institutions we investigated. These include petty corruption; bribery and kickbacks in contracting; and the market for transfers. Section 6 discusses strategies (successful and unsuccessful) employed to address corruption in these cases, arguing that it is the pairing of NPM-style reforms with strategies that draw on hierarchical and social norms that have had the greatest impact on corruption. Finally, Section 7 summarizes the case findings and offers some concluding thoughts about improving transparency and reducing corruption in South Asia's W&S sector.

2. "SMALL POTATOES" OR SERIOUS MISCONDUCT?

Paul (1995) documents the prevalence of informal payments for public service delivery in Indian cities, and payments to junior staff of public W&S agencies by household members were indeed common among the cases we investigated. Such payments are made in exchange for expediting applications for new connections; quick attention to water supply and sewer repair work; the falsification of water bills; and the provision or ignoring of illegal service connections (Table 2). The payments reportedly made most frequently—bribes given for falsified meter readings—were also of the least value (US$0.45 in a typical transaction). Among customers we interviewed, 41% said they had made such payments within the past six months; 73% of W&S agency staff interviewed said that bribes given in exchange for lowered meter readings happened "about half the time" or "virtually all the time" in their institutions. [7] Falsified meter readings require collusion that is difficult to detect in many communities because of both chronic technical problems with meters and lax oversight of field staff. As one supervisor noted:

> With the meter reading, the men are in the field and we have no control over them. Most of our meters do not work properly. It is accepted for the meter reader to give an estimate when there is no proper meter reading. We cannot go and check all the meters ourselves... [W]e must accept what they tell us... [For repairs] the customer knows that he should have the service from us. If the worker demands a payment the customer can refuse and then lodge a complaint...

Table 2. *Petty corruption in W&S services*

	Frequency of behavior as reported by...		Median reported payment per transaction
	Customers (n = 411)	W&S agency staff (n = 176)	
Falsifying meter readings for lower bills	41% had made ⩾1 such payment in past 6 months	73% "about half the time," "very common," or "virtually every time"	US$0.45
Expediting attention to repair work	30% had made ⩾1 such payment in past 6 months	10% "about half the time," "very common," or "virtually every time"; 27% "happens occasionally"	US$1.90
Expediting new connection applications	12% had ever made such payment	3% "about half the time," "very common," or "virtually every time"; 14% "happens occasionally"	US$22

Source: Author's calculations.

> We cannot punish the worker but we can tell him to go and do the job without a payment of any bribes.

Customers who need service repairs or who desire a new service connection—services to which they are entitled—have the option of repeatedly requesting assistance, perhaps involving senior staff who can apply pressure for line workers to respond, or they can pay "speed money" directly to employees. Such payments, which were reported to range from about US$2 for a repair request to US$22 for a new connection, are typically made in field offices or in customers' homes, and virtually always in cash. Those unwilling or unable to pay speed money often do not seek help for genuine service problems, knowing that agency staff will ration their time among bribe-paying customers.

Among 180 households interviewed in one city, for example, 57% had not made a complaint to their W&S service provider in the past six months (Figure 1). Of these, only 46% said this was because they had not experienced a serious problem with their services; the remaining 54% did have problems such as leaks or sewer blockages, but felt that complaining to their service provider would not result in the problem being solved. Instead, 52% of these respondents hired someone to fix the problem while 48% made the repair themselves. Among the 43% of households who did request service repairs, the majority (85%) reported paying no "speed money." Among this group, the median number of complaints lodged per problem was four. For the 15% of respondents who did make informal payments, the median number of complaints was two. Virtually all of these complaints are lodged in person, thus requiring time during the workday, and possibly the cost of transportation, to meet with agency staff.

Whereas our sample size is small, it appears that customers who are unwilling or unable to pay cash for rapid attention to their W&S service problems should be prepared to pay with their time.

Most managers in W&S agencies that we interviewed expressed disapproval regarding bribery for meter reading and repairs among their staff. By contrast, very few considered the tolerance of illegal service connections to be a serious offense. [8] In one city, we learned about a vigorous private plumbing market in which a household can obtain a water supply connection for roughly half the official fee charged by the public provider. Recurrent costs of service for an illegal connection are simply the costs of maintaining it and concealing its existence, perhaps including payment to a line worker who discovers it. Among institution staff we interviewed, respondents felt that on average such payments are made in roughly 20% of cases (i.e., once in every five illegal connections discovered), particularly when the household is using a pump or has installed pipe that is larger than that used in legal connections. "The rest of the time, no one expects a payment," one junior engineer explained. "A 'normal' illegal connection cannot be disconnected, so the customer is not afraid and will not pay." [9]

Indeed, even when illegal connections are reported to the W&S agency, usually only a warning or a trivial fine is levied against the offender. Emphasis is placed on "regularizing" the household, i.e., convincing it to become a paying customer of the service provider. Staff of W&S agencies are under intense political pressure against disconnecting households with illegal connections, who are generally perceived to be lower-income residents. Moreover, the impact of dismantling illegal connections on the service provider's financial health is often
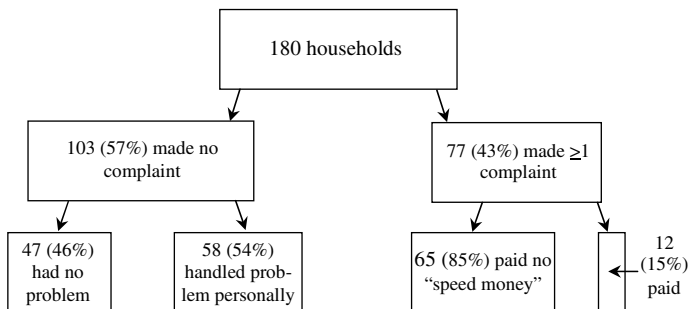

Figure 1. *Customer response to W&S service problems.*

minimal. In the city referenced above, the W&S agency estimates that roughly 40% of the water put into the distribution system is UFW (unaccounted-for-water), i.e., water for which the agency receives no payment. [10] Of this volume, roughly one-third is thought to be withdrawn through illegal connections. A crackdown that regularized all illegal connections would recoup only about 8% of the agency's service delivery costs. Clearly the existence of illegal connections poses other burdens on the W&S network; however, from a revenue perspective service theft at current tariffs is not terribly costly while, from a political perspective, removing illegal connections can have serious repercussions.

Given the relatively small monetary values involved, the difficulty of detecting collusion between customers and staff, and the disincentives for supervisors to punish field staff for misconduct, it is not surprising that petty corruption receives little attention from supervisors in W&S agencies. At the same time, because such misconduct involves customers directly, it shapes public perception in important ways. One former director of an urban water board places great emphasis on addressing petty corruption because

> we must try to improve our public image...[the] people must perceive us as honest. Otherwise, how can we make a case for increasing the tariff? The customer says 'I am having to pay an extra 100 rupees just to have my repairs made on time.' We cannot have this kind of image and expect public support.

A mid-career engineer in a state water department agreed:

> It is true that these payments do not involve a lot of money. But they involve the people's trust. It is corruption at their doorstep. It is corruption they can describe...first hand. So if you can reduce this kind of corruption they will know it. They don't have to take your word for it.

Not surprisingly, those employed in positions typically associated with petty corruption take a different view regarding its importance relative to other types of misconduct, even as they confirm its pervasiveness in their institutions. Among 80 respondents in one urban W&S agency, 52% agreed with the statement that, "Almost everyone uses contacts or money to get better services or special treatment," while 31% agreed that payments from customers to employees in exchange for faster service "ben-efit the customer and the employee without harming anyone else." Many pointed out that, in South Asian culture, the exchange of favors and small amounts of money, both in one's public and private life, is both commonplace and unobjectionable. [11] As one field technician summarized, to staff at his level petty corruption is generally viewed as "small potatoes." "No one calls this as corruption, even... [Corruption] is happening at the higher levels" where greater opportunities for rent-seeking exist.

3. "COMPETITIVE" CONTRACTING

When pressed for an example of where "real" corruption in W&S service provision occurs, field staff often pointed to the procedures by which professional engineering staff award and implement construction contracts with private firms. Two processes operate to subvert fair and honest contracting in W&S services: contractor cartels and political influence in contractor selection. In every institution we investigated, some form of competitive bidding was employed; nevertheless, contractor cartels were operating in every case. Cartels subvert the goals of competitive bidding by deciding the outcome of such processes *ex ante* among their members. One contractor described the process as follows:

> A group of [contractors] meet on the weekend in the office. We have a list of contracts being offered by [the public W&S agency]. We draw names out of a bag to see who will be the winner for each contract. That person decides what he will bid for the contract, and everyone else bids something higher than that.

The pre-determined winners of the contracts reimburse the losers for their bidding fees. The few contractors who were willing to provide such information estimated that the values of winning bids are roughly 15% higher than what would be bid in a competitive environment.

Many W&S agencies have attempted to address the cartel problem with the use of official unit-cost restrictions established in "rate books" listing average and maximum unit costs for materials (e.g., pipe, cement, pumps) and services (trench digging, tank construction). Bids that exceed these estimates by some threshold (often 20%) will typically be rejected. Whereas this policy has helped reduced the scope for collusion in some cases, in others the

cartel system remains quite powerful. One staff member of an urban W&S institution described with visible irritation his effort to challenge the cartel that, he believed, had fixed the bidding on a contract for which he was responsible:

> The bids came in and they were all very high. Much too high. I called in the three lowest bidders and showed them our rate book. I told them that their rates were forty, fifty percent higher than our approved rates. I could not accept the bid without getting approval from [my superiors]. They wouldn't change their bids. I was very angry... [T]his project was for a poor colony, you know. I dismissed all the bids and announced a new tender for the project. When the new set of bids came in they were even higher than before.

Public-service agencies have also been advised to reduce the scope for contractor collusion by breaking large contracts into several smaller ones, often as part of a larger decentralization process. Evidence from our cases suggests that this strategy may, in fact, help to reduce collusion. Contractors we interviewed reported colluding on roughly one-half of the contracts on which they bid—generally what are termed "medium-size projects." Collusion is not viewed as being worth the effort for small projects, where the potential for overinvoicing is small. At the same time, splitting a large contract into a number of smaller ones sacrifices economies of scale, both in executing the work and in contract administration. If such losses exceed the typical 15–20% bid inflation reported by contractors, from a purely economic perspective this strategy is not advisable. [12]

Contractors we interviewed also said that they generally do not form cartels to bid for large contracts, because these are "too important for anybody to forgo." Instead, contractors compete against one another by partnering with elected officials and senior bureaucrats, who can provide insider information and/or carefully manipulate tender documents to subvert even the best tendering systems. One former senior agency official described the considerable pressure he faced from his minister to skew the selection of contractors on a large foreign donor-funded project, despite the presence of clear and transparent selection criteria and guidelines:

> These criteria are never as objective as they might seem on paper. [*The respondent was asked for an example of such a criterion.*] [O]ne of our criteria is "experience" ...the contractor has to show that he has completed a project of a similar size. This seems very objective. But how does he show us? With copies of contracts. Do we check the contracts? We see whether the project has occurred and we can have a general sense for its size. But the numbers can be changed to show that the project was bigger than it actually was... You know, all of this information is private. Even the contractors' competitors [who do not win the contract] cannot challenge it... It all depends on who is running the tendering process and whether he is under pressure to award the project to a certain man.

Among the few contractors who admitted to making payments to politicians for assistance in winning tenders, the value of those payments ranged between 1% and 6% of the contract value. Others said that the *quid pro quo* can also take the form of noncash exchanges. In one case, "[the official] wanted a water line extended to a colony that was not included in the project. We agreed that he would help us get the contract and we would do this extra work."

Whereas one cannot say whether cooperation between contractors and politicians on large contracts is costlier to W&S agencies than is contractor collusion on "medium-sized" contracts, a few observations can be made. Payments made to elected officials are recovered by contractors during contract execution, typically through the use of substandard materials and/or overinvoicing. Because the scale of these projects is large, detecting fraud is challenging even with reasonably good auditing procedures. Payments made among contractors (i.e., the reimbursement of bidding fees) are recovered in the inflated bid values of the winning contractor. The possibilities for fraud are somewhat constrained given the smaller size of the contract. Except in communities whose elected officials have a substantial financial stake in the contracting business, it will also likely be easier to generate the political will necessary to address contractor collusion as compared to political interference in the tendering process. [13]

4. THE KICKBACK SYSTEM

Contractors work together or with politicians to win projects with their local W&S service providers on favorable terms. They also cooperate with technical staff to increase their profit margin once a contract is secured. Through complex arrangements funds budgeted for

construction are "skimmed" and shared by a number of different actors. Contractors often pay either a percentage of the contract value or a lump-sum amount to one or more actors within the agency. The payments are almost always made in cash, in the W&S agency offices or in the field. Notably, in most agencies staff reported that such payments are made only after contractors have been issued payment for completed work. Technical staff thus have a stake in seeing that construction works proceed apace, and the kickback system provides some impetus for timely completion of projects. Because these employees also have a vested interest in facilitating the processing of contractors' bills, they also often advocate with their agency's accounting departments to ensure prompt review and remittance of payments.

The value of kickbacks paid was fairly consistent among the sites we investigated— between 6% and 11% of the contract value, on average. In one agency the schedule of payments for contracts valued up to US$44,400 is 1% of the contract value to each of six or seven staff members involved with the project (for a total payment of 6–7% of the contract value), starting with senior engineering staff and ending with the technical field supervisor. For contracts whose value exceeds US$44,400, lump-sum payments of between US$220 and US$1,100 are made to the same set of individuals (with senior staff receiving higher amounts). In virtually every W&S institution we visited contractors and agency employees confirmed that similar practices have occurred throughout their careers. One contractor produced a laminated card upon which he had written the payment schedule for kickbacks. "It is too hard to remember all the rules," he explained. "I don't want to make a mistake and pay any more than I have to."

Using a range of assumptions regarding the number and size of contracts issued annually, one can use the information collected from these cases to derive a very rough estimate of the annual value of side payments from contractors to staff. Half of the respondents said they thought that the payment of kickbacks from contractors to agency staff occurred in at least 75% of contracts awarded (Figure 2). One-quarter said that such payments occur "infrequently" or "never." These responses can be used to generate a weighted average regarding the perceived frequency of contractor–employee kickbacks. Given the caveats noted in
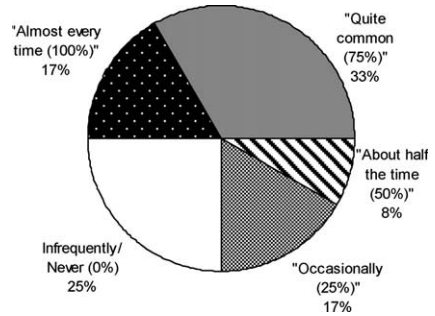

Figure 2. *Frequency of side payments from contractors to W&S institution staff (n = 176).*

Section 1, the data suggest that such payments are made in just over half (52%) of contracts issued.

Of course, this side payment system must confer upon contractors a benefit whose value exceeds the amount shared with agency staff. It is important to note that these payments occur after award of the contract; they are separate from any transactions that occur as part of the tendering process. The *quid pro quo* for the contractor kickback system is complicity of agency staff in the use of substandard materials, falsified materials invoicing, and the use of construction "shortcuts" in the field. For example, if a 20-kg manhole cover is noted in the design specifications, a contractor might use a cheaper 12- or 15-kg cover. In a repair contract, staff may report that 200 m of pipe need replacement when only 100 m are actually faulty. Funds are budgeted for the full length, and the cost of the extra 100 m of pipe can be pocketed. [14] Estimating the value of such shortcuts was beyond the scope of our research; however, if one accepts the above premises it must be concluded that, where the side payment system is operating, a W&S agency and its customers are typically fleeced of labor and/or materials valued at least at 3.2–5.5% of its contract budget each year.

One reason that it is difficult to estimate the value of materials substitutions, falsified billing, and other contractor shortcuts is that, at times, it is actually necessary for agency staff to doctor project invoices simply to give contractors a fair price for materials and services. The rate books used by many institutions are not updated regularly, and contractors are simply unable to secure materials or labor at official prices. Discussing the out-of-date rate books he is required to use for contracting, one senior

engineer in a state water authority noted that "[e]ven I would not want a contract with us for these rates. Inflation in [this region] is six percent. Our rates have not changed in almost three years." To sidestep this problem, purchases are routinely overinvoiced in the same manner as with the "cream skimming" behavior described above. Staff described sitting with contractors in their office and together computing the amount of falsification necessary to create a fair arrangement for the contractor. Indeed, it is difficult to detect where one type of behavior ends and the other begins. One might even argue that the relatively more "honest" form of records manipulation introduces staff to and trains them in practices that can subsequently be employed for personal gain.

5. THE MARKET FOR TRANSFERS

Many scholars and practitioners advocate reducing the opportunities to develop unhealthy relationships between staff, local politicians, and residents (Klitgaard, 1988; Rose-Ackerman, 1999). Most South Asian public-service bureaucracies do have a policy of transferring their professional staff every two to three years. Yet it is precisely this policy of regular transfer that has created a thriving market for desirable posts and has allowed elected officials to become *de facto* personnel managers in public-service institutions. Evidence from these cases suggests that little has changed since Wade's (1985) profile of Indian bureaucracies almost 20 years ago. A favor-bartering system between leaders and staff operates in most of the institutions we studied; a cash market for desirable posts also exists in several locations. In general, desirable posts are those that place staff close to their home territory, as well as those whose duties involve regular interaction with contractors and materials suppliers (where the kickback system described in Section 4 is in operation).

Staff that we interviewed have developed a remarkably sophisticated calculus to estimate the value of a particular post (its extra-salary revenue generating potential) and thus the maximum amount they are willing to pay to secure a transfer. Very few staff reported paying their superiors for such transfers; instead, monies are given to politicians or unelected local leaders, who exert influence (and sometimes share part of the fee) with higher-level bureaucrats. Prices for different kinds of posts appear to be well established. In state-level agencies where the range of possible transfers is comparatively larger, a "plum" post (e.g., to a construction division within a desirable geographic location) costs the equivalent of four months' salary. The price of a position in construction or procurement located in a less desirable part of the state was 2.5 months' salary. One staff member explained his choice of this second type of position as follows:

> I could have taken the position in [Location A] for [4 months' salary]. But I am trying to save money to build a new house. So I will go to [Location B] and I'll build my house in [Location A]. After three years, I will have saved enough money to get a transfer to [Location A] to be with my family.

Payments are not simply made at the end of each two- to three-year posting. As one staff member explained:

> If I want your position I can get help from someone to have you transferred out, even if you have been there less than two years. You will be told that "someone" wants your post and is willing to pay a certain amount for it. If you can pay more than that, you will keep your post.

Unless a staff member has additional sources of income, he/she must recoup the amount spent in the transfer market from the authority vested in the post itself. For a 36-month "plum" position, this implies that the staff member must generate extra-salary earnings of at least 11% of his/her salary each month just to break even.

Of course, cash is not the only currency with which staff can transact in the transfer market. One mid-level engineer described his authorizing water supply connections to a group of households on unregistered land (where public services are prohibited by law) in exchange for an assembly member's assistance with a transfer request. Another said that he provided several tankers of water without charge to a wedding celebration for a local leader, who in turn helped the staff member keep his post for a period beyond the typical three-year transfer threshold. Interviews with staff suggest that this form of exchange is more common than direct payments to influential individuals for their assistance with transfers (Table 3).

The market for transfers is a form of corruption that can generally be addressed only with large-scale civil service reform.[15] It is relevant to the results of this research, however,

Table 3. *The use of favors and bribes for promotions and transfers*

	How often do you think this particular form of favor or influence happens in [name of institution]? Please note that I am not asking about your involvement, or of anyone in this [office/section/department], but about the entire organization			
	Staff exchange professional favors for political influence in obtaining promotions (%)	Staff are expected to make side payments in order to obtain promotions (%)	Staff exchange professional favors for political influence in obtaining transfers (%)	Staff are expected to make side payments in order to obtain transfers (%)
Almost always (∼100) or quite common (∼75)	13	6	44	13
About half the time (∼50) or occasionally (∼25)	36	26	46	56
Rarely or never (∼0)	50	68	9	31
Do not know/Not sure	1	0	1	0
Weighted average	20.5	11.8	51.5	27.5

Source: Author's calculations.

because of its links to corrupt tendering, procurement, and contractor supervision. In particular, staff engaged in these behaviors consistently rationalized them by citing the requirement to generate cash or debts of favor to maneuver successfully in the transfer market. The sense of inevitability with which this 16-year veteran of one public W&S agency discusses corruption is typical:

> I started in this job and I wanted to bring water to the people. I was not going to be involved in all those things [*respondent confirmed that "those things" referred to exchanges between staff, local leaders, and contractors*]. The first time [a local leader] asked me to give water to a colony out of the [agency's] service area I reported to my [supervisor]. He did not want to become involved and said that I must deal with the matter... I thought it was a test for me. [*Laughs.*] I didn't know anything. I told [the local leader] that I could not give service to the colony... The next month my [supervisor] transferred me to another [department].

The respondent also described his efforts to resist making cash payments in exchange for favorable transfers, as he (like many staff) view this behavior as being "more corrupt" than giving preferential or illegal service to influentials. Nevertheless, "[g]radually you are pulled in" to a network of barter and rent-seeking that derives moral justification from the transfer market. At the time of his interview, the employee was working to amass the US$1,300 he would need to negotiate a desirable transfer

in the following year. "Where do I get the money? Where would you get it if you were in my position?"

6. ADDRESSING CORRUPTION

The funds that this engineer needs to negotiate the transfer market will, of course, likely be made available through a series of transactions that together extract a substantial amount of cash and nonmonetary value from W&S service investments in the community where he lives (Table 4). Although it is not possible to estimate the full costs to the agencies (and, by extension, to the public) of the corrupt behaviors in W&S service delivery documented in our case studies, it is not unreasonable to suspect that these institutions regularly spend 20–35% more on construction contracts than the value of the services rendered; have a substantial proportion of their resources diverted by staff seeking to court favor with influential individuals; and provide services free of charge to hundreds or thousands of illegally connected households.

Despite the potential for recapture of a substantial amount of funds that could be channeled into improving W&S services to customers, the institutions we investigated have made few attempts to introduce anti-corruption measures into their operations. The irrelevance of much of the institutional reform advice

Table 4. *Corrupt interactions in W&S service provision*

	Customers	Professional engineering staff	Senior agency administrators	Elected and unelected leaders	Contractors
Low-skilled staff	Bribes to falsify meter readings, conceal illegal connections	–	–	–	–
Professional engineering staff	Speed money to expedite new applications, repairs	–	–	–	–
Senior agency administrators	–	Payments for favorable reviews, promotions, transfers	–	–	–
Elected and unelected leaders	Money for advocacy (e.g., preventing disconnection)	Payments, services for advocacy reposts and transfers	Services for advocacy reposts and transfers	–	–
Contractors	–	Contract kick-backs, concealment of substandard work	Tendering kickbacks	Tendering kickbacks	Collusion in contract bids

available to those working at the organizational level is partly to blame. In order for "carrot-and-stick" approaches to succeed, managers must have access to carrots and sticks. In our cases, personnel management tools such as merit-based promotions and raises, as well as demotions and dismissals, are essentially unavailable to supervisors. Fewer than 2% of management staff we interviewed could cite a single instance of suspension, dismissal or withholding of salary for an employee in his/her institution in the year prior to his/her interview. [16]

These conditions arise both from substantial worker protections in state and federal legislation, and from the links that staff at all levels have with elected officials, either directly or through labor representatives. Given that these conditions are likely to hold for the foreseeable future, reliance on NPM-style reforms alone to attack corruption seems an unrealistic strategy. Moreover, these approaches fail to take advantage of the hierarchical and social norms rooted in South Asian culture that can also motivate employees. Indeed, the strategies documented in our cases that were the most successful in combating corruption combine elements of both the NPM and hierarchical norm perspectives.

(a) *The promise of information technology*

Greater reliance on information technology in public W&S agencies makes one of the central tenets of NPM—the monitoring of staff activities by supervisors—easier and more effective. In India, the Hyderabad Metropolitan Water Supply & Sewerage Board (HMWSSB) has made considerable use of information technology to support institutional reform. For example, contrary to the current enthusiasm for administrative decentralization in public service delivery of all types, the HMWSSB has *re*centralized many functions with the aid of information technology (IT). Customers in Hyderabad used to apply for new water and sewer connections at one of the city's 120 section offices. Each application was reviewed by the section officer and then forwarded to at least 14 other desks before a connection could be installed. At each step of the way, customers reported paying bribes in order to move their file along. In April of 1999, the Board consolidated applications for new connections into its Single Window Cell (SWC) and Green Brigade (plumbing installation corps) located in the Board's headquarters.

Customers must now come to the SWC rather than filing an application in their local

district office, and all other aspects of the application are managed by the Board—such as obtaining a road-cutting permit, land surveying, *etc*. The fee schedule for various plot and connection sizes is published in the press and posted in the SWC office, limiting the opportunity for staff to levy excess charges on applicants. In promoting the SWC and Green Brigade in the press, senior management emphasized increased convenience for the customer, who previously had to obtain multiple application forms, make several office visits, and arrange for a private plumber to complete the in-house connection installation work. Evidence suggests, however, that these initiatives have also reduced informal payments in the connection process. In a survey of 50 customers who recently obtained a connection from the Board, we found that the median value of bribes reportedly paid by this group was less than US$1—much lower than the US$22 median value for our complete dataset. Moreover, customers themselves often did not consider these payments to be bribes, as they were not demanded by staff. "I was just very pleased with the service they gave," one customer explained. "They came so quickly and they were very professional. I wanted to show my thanks to them [with a] tip."

Of course, consolidation of activities carries the potential for simply concentrating rents into the hands of fewer individuals. Three important design strategies have helped prevent this outcome at the HMWSSB. First, the activities of the SWC are carried out in a public space. Staff of this department are seated behind a counter directly across from the SWC Director's office, and a waiting area for customers is located directly adjacent to the counter. It would thus be very difficult for informal payments to occur within the SWC without being noticed. Second, because the process has been designed as a one-visit endeavor, the customer rarely leaves the SWC without having received an application token number, which is the equivalent of a receipt for acceptance of the application. Finally, the use of computerized application procedures limits the scope for employees to manipulate information in an effort to extort payments from applicants. After a customer reviews and approves the application receipt generated for him/her at the Board headquarters, his/her computer record cannot be changed, but only augmented. A customer can subsequently visit his/her district office and ask that the applica-

tion record be retrieved with confidence that an accurate transaction record will be on file.

The SWC has increased the Board's control over information about new network connections and increased the accountability of staff responsible for processing new connections, both of which are standard recommendations in the NPM literature. Focusing on these aspects, however, neglects the substantial effects that several small investments in the SWC have had on staff pride and motivation. Employees have distinctive uniforms that are particularly recognizable because of the extensive press coverage the Board's initiatives have received. The SWC staff are also among the few at the Water Board that have individual computer terminals; their office is in a bright, modern, air-conditioned room with a receptionist. Among junior staff, it is seen as an honor to be selected for a position that offers both comfortable working conditions and the opportunity to gain computer skills training. Several SWC staff acknowledged that some customers had offered side payments in exchange for accelerated processing of their new connection applications. "But I like this job very much." One SWC employee explained, "I am learning a lot and we give a good service to the customer... I don't want to lose [this job] for a few rupees." [17] Together, the combination of new internal monitoring mechanisms, external scrutiny from the press, and the enthusiasm of staff engaged in this new venture has helped to increase transparency in a notoriously corruption-prone function of W&S service delivery.

(b) *Reforming the side payment system*

Most recommendations for reducing corruption in public service contracting focus on increased oversight, principally through external audits, and decreased discretion for staff. Among the cases we investigated, the most effective strategies for curbing misconduct did reduce staff discretion, but also changed their work environment such that the moral cost of corruption increased. For example, the Slum Networking Project (SNP) in Ahmedabad involves a partnership between the Municipal Corporation and three partner nongovernmental organizations (NGOs), one of whom acts as a financial intermediary between community members and the AMC, holding the community's financial contributions until all construction work is satisfactorily completed by the contractor. Over time, staff of the NGOs have

expanded to include individuals with engineering skills such that the work of contractors can be monitored on a continuous basis. The NGOs also hold training for community leaders to teach them how to measure and weigh pipe, how to evaluate the quality of masonry work, and how to document and report any problems they discover during construction.

Contractors that we interviewed who have worked with the SNP said that they have far fewer opportunities to "fudge" construction work as compared to typical contracts with the Municipal Corporation. "The community have been told to watch us," one foreman explained. "At first we ignored them. Then they would report to the [NGOs] and they would tell [the SNP staff]. They have taught them how to test the materials... [E]ven when there is a small mistake now, they are all coming to shout at us." In short, a self-interested cadre of monitors has been established in neighborhoods where the Slum Networking Program has been initiated. Assuming sufficient skills among community members and/or NGO advocates, this strategy is likely to be more workable than that of "independent technical audits" of projects so often advocated by development professionals but so rarely implemented in practice (Jagannathan, 1986). In Ahmedabad, contractors reported that they are not expected to pay the standard kickbacks to technical staff for SNP contracts because "everyone knows we cannot get that money back from the project." [18]

One should not, however, attribute the reduction of kickbacks in Ahmedabad solely to the intense monitoring of contractors. The SNP's unique working environment has also helped to develop mutual respect between the NGOs and the municipal corporation partners. SNP staff in particular report that exposure to NGO staff and community members has strengthened their commitment to supplying poor households with network services. This unusual attitude of technical staff does not go unnoticed by customers, who regularly respond with shows of gratitude. SNP staff, in turn, feel great pride in the project, as expressed by one employee:

> At the end [of each project] we feel that we have really accomplished something. People give us so many blessings. We see and feel this sentiment. Getting that respect from people is far more satisfying than constructing a bridge or a pumping station. Such activities also have a positive impact on people but not in the same way as upgrading. With upgrading the im-

pact is immediate and very visible. We are making an important contribution to their lives.

This commitment is the result not of concerted efforts by the Municipal Corporation to retrain technical experts in social intermediation skills, but of a dramatic change in technical staff's work environment. [19] Coming face to face with customers and NGO staff on a daily basis has gradually and substantially affected the attitude of engineers typically known for their arrogance and aloofness. This evolution is particularly noteworthy given the disappointment with which many in the SNP initially learned about their appointment to "the slum department." Indeed, our findings suggest an institutional model very different from that assumed by most academics and practitioners writing about public-sector reform today (e.g., Muir & Saba, 1995). [20] Staff are not simply driven by maximizing material gain, but also by a sense of pride in improving the lives of poor citizens.

A similar combination of improved monitoring and motivating work conditions has helped prevent misconduct in the International Development Association (IDA)-sponsored rural water supply project implemented by the Local Government and Rural Development Department (LGRDD) in Azad and Jammu Kashmir (AJK), Pakistan. Whereas LGRDD staff works in remote areas of the state, the project directorate keeps a tight rein on activities through field visits and biannual meetings in which each IDA project staff member—from extension workers to senior engineers—stands one by one and describes the progress made in schemes for which he/she bears responsibility. All scheme designs are approved by the directorate, and supplies purchases are limited to 105% of the quantity estimated to complete construction. [21] Private contractors have been eliminated for all but the most technically complex of the project's 1,260 schemes; instead, community members provide the required labor under supervision of LGRDD's technical staff. Supplies purchases are facilitated by the LGRDD between communities and suppliers, but the institution never stores materials itself in an effort to avoid pilferage and maintain transparent procedures.

In sum, the opportunities for "cream skimming" and collusion have been limited through careful design of the IDA project. At the same time, the role of workers' pride and motivation in reducing corruption in the project is

substantial. As with Ahmedabad's SNP, the IDA project places engineers in new and challenging work environments, often in close collaboration with villagers and extension staff who were hired to help organize participating communities. Most technical staff were not told, at the time of their hiring, about the extent of community work that would be required of them. "I thought I was hired as an engineer," one employee recalled. "Then I found out I was going to be an engineer, a community organizer, a policeman, and a laborer for this project." Extension workers helped their colleagues respond to, and eventually to value, the questions, complaints, and needs of community members. Over time, technical staff have gained experience and confidence in working with villagers, and have formed close bonds with communities to which they are assigned. During interviews both overseers and extension workers expressed a palpable sense of ownership for the project, speaking of "their" villages and schemes. Similarly, during village visits staff were greeted warmly by residents, who called them "heros" and "members of our family." Indeed, rather than being known as local government staff, those assigned to the project were known as "IDA staff," who

> . . .will go where no one else will go. The villages in the mountains where they have never had a project—we will go there. We will work late into the evenings. We work on Sundays. We work with the people, we don't exclude them. This is how we are seen by the people. (*Junior engineer*)

Again, pairing of improved monitoring with heightened staff motivation together reduce leakage in the IDA project. Among the staff we interviewed, roughly half reported being accosted by elected officials or village leaders seeking to misappropriate supplies, to accept substandard materials for construction, or to expedite the approval of a village's application for the project. Of these, 40% said they relied on the project rules to demonstrate an *inability* to cooperate with the request. The rest said they cited the principles of the project, emphasizing the trust that had developed between the staff and villagers, to signal their *unwillingness* to break the rules.

(c) *Engaging—or bypassing—elected officials*

The interference of politicians in the IDA project conforms to a larger literature in which elected officials are consistently viewed as the central obstacle to sustainable W&S planning (e.g., Savedoff & Spiller, 1999). Much of the policy advice for developing countries centers on large-scale institutional reform that reduces the scope for political influence in the decision-making processes of public agencies. The establishment of credible regulatory boards, for example, is a common recommendation for increasing the transparency of tariff setting, yet is being pursued by none of the institutions we investigated. In our cases, greater progress has been made in encouraging constructive political involvement at the organizational level, where social marketing and education of the political leadership, as well as the use of information technology to reduce informational asymmetries between leaders and the public, have enjoyed success.

One rural water supply initiative we investigated, for example, initially took measures to insulate staff from the influence of politicians. A *de facto* project management unit (PMU) was established within the state-level W&S agency, and staff received stern warnings regarding the need to maintain distance between the institution and elected officials. In some cases, elected officials actively discouraged villages from enrolling in the project, promising to sponsor a water supply scheme with fewer cash and labor contribution requirements than those of the state agency. In other instances, politicians accosted project staff in the field and requested a few free pipes from the project's stores. Gradually, the amount of staff time dedicated to correcting the misinformation communities received about the project from their elected officials increased, and the pace of their work began to slow.

Finally, senior officers began a virtual social marketing campaign for the project through courtesy calls to individual politicians. Armed with informational pamphlets, they described the project as an opportunity for officials to increase their influence with communities by helping them to enroll and maintaining a visible presence during project implementation. Although this strategy did not work in all cases, many politicians did embrace the opportunity to improve services to their constituents with no outlay from their own development budgets. "I don't know why we didn't meet with [the elected officials] in the first place," one staff member observed. "Most of the conflict was just that they had no information about what we were doing." Politicians subsequently

became involved in settling a number of social disputes related to the project. In one case, an uphill village located near a water source obstructed the distribution lines serving a downhill community, insisting that their water supply should also be improved. Along with staff, it was a local politician who brokered a compromise arrangement that allowed the scheme to begin operating, while the uphill village was subsequently enrolled in the project.

Outreach to politicians will succeed only if existing systems of accountability provide some incentive for officials to cooperate. It is likely, for example, that the establishment of a project implementation unit—with relatively more insulation from political influence than the "core" public W&S agency—was a necessary pre-cursor for successful negotiation of politicians' involvement in the rural water supply initiative described above. Among the other cases we investigated, less progress had been made in establishing productive relationships between elected officials and public W&S service providers. In one city, a progressive W&S agency director established a program in which middle-tier staff held public meetings with customers in their districts once a month. Problems and complaints presented by customers during these two- to three-hour sessions were assigned to particular staff for follow-up, with explicit deadlines for resolution noted in the meeting minutes. Among the more than 50 management staff we interviewed in this agency, 90% reported that such meetings with customers were helpful for them—yet the program was abandoned after only a few months. Senior staff explained that some of the city's elected representatives were unhappy about being bypassed in the dialog between the W&S agency staff and their constituents. These politicians lobbied a senior state official, who ordered the agency director to suspend the program.

In such cases where opportunities to align the objectives of politicians with those of the service provider are lacking, the media can provide an alternative strategy for reaching out to customers. In the Indian city of Hyderabad, a former Managing Director (MD) of the Metropolitan Water Supply & Sewerage Board (HMWSSB) established a weekly press briefing with local reporters in which he discussed the progress of the Board's reforms. The MD also participates in a weekly television program called "Face to Face," in which representatives of the city's service agencies field questions and complaints from customers during a live broadcast. Finally, the HMWSSB uses local press and news programs to publicize its new toll-free complaints hotline and *Citizen's Charter*, a statement of customers' rights. The state's Chief Minister said of the *Charter*, "Even our most strident critics will have to admit that it represents a quantum leap in the relationship between the government and the citizen in India. It seeks to formalize a contract between the two, which affirms that the citizen has a right to service" (Naidu, 2000). These strategies avoid antagonism of local politicians, who cannot publicly oppose sweeping statements about increasing accountability to customers. With both literacy rates and penetration of information technology on the rise in South Asia, the popular media appears to be an increasingly promising way to increase public awareness of, and pressure for, institutional reforms.

7. SUMMARY AND CONCLUSIONS

The range of corrupt behaviors in water supply and sanitation service delivery outlined in this paper is likely not surprising to professionals familiar with public institutions in South Asia; however, the sophistication and pervasiveness of the exchange systems could well discourage those interested in initiating reforms to boost transparency and reduce rent-seeking in W&S services. Indeed, one understands why leadership in the institutions we studied uniformly chose to avoid direct discussion, much less confrontation, of these issues. [22] At the same time, it is encouraging that even in this challenging operational environment we documented several strategies that do appear to have reduced corruption in service delivery. Among these, every one shared two drivers: one which altered accountability networks in service provision, and one which changed the attitudes of service providers in a way that increased the moral cost to them of misconduct.

This observation is particularly important given that most public-sector reform literature focuses on the former category of drivers to the near exclusion of the latter. Many innovations documented in our cases—employing information technology to decrease discretion, engaging NGOs and communities to monitor projects, eliminating materials stores to reduce pilferage—are standard prescriptions of a lit-

erature that portrays staff of developing-country public agencies principally as self-interested, profit-maximizing individuals.[23] Whereas many of our findings implicitly support this perspective, they also suggest that a broadening of the model is in order. In particular, it is important to note that each instance of successful "traditional" public-sector reform was accompanied by parallel developments that, sometimes unintentionally, built new commitment and pride among the concerned staff. Regular interaction with social intermediation specialists and customers, for example, was not merely a mechanism for increased monitoring of technical staff; it also brought engineers face to face with the daily hardships of customers and stimulated a new sense of calling in their positions. Introducing information technology did not simply consolidate the activities and limit the discretion of staff involved in approving new connections; it also conferred status and training opportunities for which staff competed eagerly.

Indeed, in those instances in which a NPM-style reform was implemented with no concomitant driver that changed the way employees felt about their jobs, the result was resentment and eventually sabotage of the reform itself. In Hyderabad, for example, a toll-free customer hotline was established to streamline the reporting of complaints and repair requests for the water board. A database that includes information on the nature, location, and logging time of each complaint is used to generate an "efficiency rating" for each manager, which is computed by dividing the number of complaints he/she received in a given month that were resolved within the target time frame by the total number of complaints he/she received during the period. Efficiency ratings are reported monthly to the MD, and are also displayed publicly on computer terminals in various Board offices. The MD has been very active in monitoring these ratings; the managers we interviewed were keenly aware that their performance was being monitored in this way.

Over time, the monitoring system has engendered frustration among the Board's managers. One manager working in the densely populated Old City expressed his frustration as follows:

Is it fair to compare my complaints with the manager sitting in Banjara Hills [one of the city's most affluent neighborhoods]? My lines are twice as old as his. My engineers are assaulted when they go into the field on

a repair order!... [W]e are promising more and more to the customer, but nothing has changed for me.

In sum, whereas the use of monitoring strategies can indeed motivate employees, it can also frustrate and demoralize them, eventually encouraging them to derail the systems designed to inspire them. Indeed, in a recent check of the efficiency rating system in Hyderabad, 245 random follow-up visits were made for complaints that managers' records indicate as having been resolved. In roughly one-half the cases, customers reported that the repair had in fact not been made.

Clearly the design of initiatives that both reorient accountability networks and instill pride and commitment among staff is a formidable challenge. Among our cases, heightening accountability was effected by improved monitoring, as well as by involving new actors in W&S planning and service delivery. Notably, monitoring and accountability were not linked by traditional management tools such as promotions or dismissals, but by public assessments (e.g., group staff meetings with superiors, open-air sessions with customers) that exploited the power of shame and pride. Such approaches seem particularly well suited for strongly hierarchical institutions such as those we visited in South Asia, although similar strategies have been documented in other regions as well (e.g., Tendler, 1997).

Broadening accountability networks by involving new actors in public service delivery—particularly those from the private and NGO sectors—is a common prescription for reducing monopoly control over information and thus opportunities for corruption. The success of this strategy, of course, requires that those new actors are themselves accountable to households (Ebrahim, 2003). It also depends on the leverage that these new actors exert over decision-making. For example, NGOs carrying out "report card" studies generate information than can be very valuable in public-sector reform efforts, but they have little direct impact on service delivery staff behavior. The NGOs involved in Ahmedabad's SNP, by contrast, enjoy considerable influence in their relationship with the Municipal Corporation, primarily because one of the organizations serves as a financial intermediary for communities participating in the project. If the NGO refuses to work in a particular community, the SNP cannot proceed unless residents can open bank accounts in a commercial bank, or are

willing to make their required financial contributions to the city up front—both of which are unlikely. Where civic or private-sector organizations do not have this type of "mission critical" role in service delivery, partnerships to improve accountability may be less effective.

As noted in Section 6(b), partnerships between NGOs and public W&S agencies had the added effect of motivating public-sector employees in unanticipated ways. Another strategy for instilling pride among staff that met with success in many of our cases was the creation of new institutional structures for service delivery. It is certainly true that some of these bodies enjoyed special protections from administrative procedures (e.g., the IDA project in AJK and the Slum Networking Program in Ahmedabad) which itself can promote transparency in service delivery. [24] Equally important, however, was the excitement and motivation generated by staff's association with

a new venture. Beginning with simple acts such as uniform distribution and group photographs, individuals in each new program formed a cadre that increasingly strove to set itself apart from the parent organization from which it emerged. Specialized training and responsibilities further distinguished these staff from most of their colleagues, while also cementing the bonds among group members. Given the limited opportunities for merit-based advancement within their organizations, staff looked outward—to customers on one hand, and to bilateral and multilateral donors on the other—for validation that sustained their commitment. Indeed, given the sizeable reforms that must occur in the civil service in order to unravel the web of corrupt practices in public service provision, strategies that enhance these feedback mechanisms between customers, civic organizations, development agencies, and employees may be one of the few workable strategies for reducing corruption in the foreseeable future.

NOTES

1. Following Kaufmann (1998) and others, the term *corruption* is used in this paper to refer to a range of misconduct involving the use of public office for private gain, including bribery, extortion, theft, and embezzlement.

2. As one example, since 1997 all World Bank country assistance strategies have included an assessment of "corruption risks" to Bank projects. The World Bank's anti-corruption policies and materials are available at www.worldbank.org/publicsector/anticorrupt/.

3. New Public Management (NPM) refers to a set of principles for administrative reform of public agencies that emphasizes competition, decentralization, greater accountability to customers, and, more generally, the development of a flexible and entrepreneurial environment that is typically associated with private-sector organizations. For more on NPM, see Osborne and Gaebler (1992). For a discussion of the application of NPM principles in developing countries, see Polidano (1999).

4. One exception is, of course, Robert Wade's excellent accounts of corruption in the irrigation sector. Our cases include only institutions responsible for drinking water supply and sanitation. Paul (1995) and Paul and Sekhar (1995) have also included water supply and sanitation among the public services rated in their "report card" studies of several South Asian cities. Klitgaard, Ma-

clean-Abaroa, and Parris (2000) also include empirical information on corruption and its control from cases such as Hong Kong and La Paz.

5. In this paper, I discuss only those findings relevant to transparency and corruption in W&S service delivery. For a more thorough discussion of the four cases with respect to other "good governance" issues, see Davis *et al.* (2001).

6. A team of graduate students from the Department of Urban Studies and Planning at MIT conducted field research and helped to develop the case studies from which much of the information presented in this paper is drawn. They include Sunil Tankha, Asha Ghosh, Paul Martin, Taimur Samad, and Bilal Zia.

7. Interviewers discussed a number of forms of corruption with each respondent and asked how common he/she thought each behavior was in the institution with which he/she worked. Specifically, respondents were told: "On this card we have listed some forms of favors and influence that can occur in a W&S agency. For each one, I'd like to know how common you think that particular form of favors or influence is in [name of institution]. Please note that I am not asking about your personal involvement, nor about the involvement of anyone in this [section/department/*etc.*], but about the entire organization." The possible responses were

"Almost every time (100%)"; "Quite common (75%)"; "About half the time (50%)"; "Happens occasionally (25%)"; and "Very infrequently or never (0%)." These values have been used to generate the weighted averages presented throughout the paper.

8. We could obtain very few estimates of the number of illegal connections for any of the nine sites where we collected data. Most communities do not have bulk meters on their networks, making even general unaccounted-for water (UFW) estimates unreliable. Using available data and assumptions regarding (a) the proportion of UFW attributable to illegal connections and (b) the volume of water used by a typical illegal connection, we were able to generate very rough estimates of the number of illegal connections for the urban sites we visited. These estimates ranged widely, from 1.4% to 12.5% of the number of legal connections, i.e., for an institution managing 350,000 official connections another 4,900–43,750 illegal connections are also thought to draw water from the network. It was not possible to compute such estimates regarding the number of illegal sewer connections given available information.

9. Households were understandably reluctant to discuss illegal service connections. In our survey of 180 households in one urban area, fewer than 1% admitted to having an illegal connection and none reported making payments to line staff in order to conceal it.

10. High levels of unaccounted for water (UFW) are common in developing country W&S institutions, with an average rate of 35% estimated for one group of 50 countries in the Asia–Pacific region (ADB, 1997). Such losses include physical leakage as well as nonrevenue losses, the latter of which refers to water that is used by customers who do not pay for it (e.g., because they have illegal system connections or are given service free of charge) or who pay less than they should (because, for example, they have tampered with their water meters or paid bribes).

11. Schnek (1989) also documents local perceptions of corruption in India. Rose-Ackerman (1999) is one of the few authors to suggest that petty corruption may be best minimized through informal social controls, as opposed to formal policies and legislation.

12. One could argue, however, that there is additional value in any strategy that helps "cleanse" the contracting system, e.g., by signaling reduced tolerance for misconduct in tendering and by reshaping institutional culture. See Nas, Price, and Weber (1986) for a more thorough application of cost-benefit analysis tools to issues of corruption.

13. Of course, donor agencies and development banks tend to prefer fewer large contracts for projects they fund, because administration and monitoring are simplified.

14. In some cases, contractors noted that procurement procedures had been "tightened" such that the full amount of supplies had to be purchased (rather than merely invoiced). The excess materials were then sold in order to realize the extra profit.

15. It is interesting to note that, whereas the granting of transfers is widely considered to be corrupt, the granting of promotions is not (see Table 3). What can be learned from the promotion system and applied to the reform of the promotion system is a topic addressed by some researchers (e.g., Das, 1998) but which clearly merits greater attention.

16. Indeed, one manager of a state water board said that he would never again take action against a subordinate unless he "caught the man with a bag of money in one hand and...twenty witnesses in the room." Previously he had initiated dismissal proceedings against a technician who was responsible for the installation of 42 illegal water connections. "Two months after the investigation [began], I learned that it was me who would be punished," he recounted. The technician kept his post while the manager was shifted to a rural outpost with "nothing to do but wear the uniform," purportedly as a result of intervention on the technician's behalf by a senior union official.

17. Note that the employee was not concerned about dismissal from the Water Board, but simply about his possible transfer out of the SWC (as discussed in Section 5).

18. One might wonder why contractors would be willing to work on SNP projects, given the close monitoring and interference from community members and NGO staff they experience in the field. According to the contractors, bill payment is much quicker for SNP projects as compared to "standard" Municipal Corporation contracts, largely a result of the budgetary autonomy granted the Slum Networking Cell.

19. This experience stands in marked contrast to Hyderabad, where extensive training of technical staff in customer relations skills—without a concomitant change in the work environment of employees—has

had less impact on the attitudes of most technical staff (see Davis *et al.*, 2001).

20. One important exception is Judith Tendler's (1997) research on effective development initiatives in Brazil.

21. Project engineers complained that such tight constraints often resulted in their having to wait weeks for orders of additional supplies to be filled when supplies shortages were discovered during scheme construction. "I know we must be precise, and I know why," one frustrated engineer said. "But the village loses hope when we are almost finished and then we are needing just a few more pipes."

22. One exception was the head of a large water and sanitation agency who spoke publicly about his intention to break the contractor cartel and kickback systems operating in the organization. He was transferred to a new post after only five months on the job.

23. For a summary of this literature, as well as of research on worker motivation and workplace transformation in industrialized countries, see Tendler (1997).

24. This is, of course, one of the principal arguments in favor of project management units (PMUs) in donor-funded projects. A number of disadvantages with the PMU arrangement have been documented, however, both in our own work (Davis *et al.*, 2001), as well as by others, e.g., Therkildsen (1988).

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APPENDIX A. DESCRIPTION OF DATA COLLECTION ACTIVITIES

The information summarized in this paper was collected as part of a larger research effort on public-sector reform in the W&S sector. All data collection activities were carried out by the author; five advanced graduate students from MIT's Department of Urban Studies and Planning; and 26 college-educated enumerators trained in interviewing and/or survey administration by the MIT team. In each site we partnered with one or more local institutions (e.g., a research institute or nongovernmental organization) that collaborated with us on the development and pre-testing of data collection instruments, a well as on identifying the enumerators.

We employed a variety of field approaches for primary data collection in the nine sites we visited. Our activities included 356 semi-structured interviews with staff of W&S agencies; 164 semi-structured interviews with "key informants" such as NGO staff, union representatives, journalists, and elected officials; structured interviews with 405 customers of W&S agencies; and focus group discussions with 331 W&S agency customers and 158 "key informants." We also observed dozens of public meetings between agency staff and customers, as well as daily operations of agency field offices and staff training sessions.

As noted in Section 1, we were in most cases unable to employ simple random sampling procedures in selecting respondents for our data collection activities. We used systematic procedures to draw most samples; for example, in one community of 640 households we sampled every 13th dwelling in order to compile a sample of 50 respondents. It is also important to note that the primary focus of these activities was not corruption, but a range of innovations undertaken by W&S agencies to improve responsiveness and accountability to customers, particularly to low-income households. As such, the interview guides and surveys we used were tailored for the particular conditions and focus issues in each location, although we attempted to maintain consistency in question wording across the sites where possible.