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Field Note

Performance Improvement Planning

Developing Effective Billing and Collection Practices

Improving billing and collection activities has an immediate impact on the revenue streams of a service provider that can, in turn, encourage commercial and operational efficiencies for aiding the expansion and delivery of improved, reliable, and sustainable services. This note draws on national and international cases to explore what it takes to implement an effective billing and collection system.

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Executive Summary

Water utilities and service providers in India are plagued with severe deficiencies in the delivery of services, with access to reliable, sustainable, and affordable water supply and sanitation services remaining poor in general. The sector's worrying performance is caused, among other reasons, by financial and capacity constraints, including the absence of a commercial orientation to services, institutional deficiencies, and the lack of systemic incentives to deliver ongoing quality services.

Effective billing and collection systems are a critical component for ensuring the viability of a service provider. Improving billing and collection activities has an immediate impact on the revenue streams of a service provider that can, in turn, help the service provider in improving services. However, while effective billing and collection practices depend on many internal factors (including customer databases, the extent of metered and unmetered service provision, tariff and billing structures, delivery of bills, and facilities for customer payments), the institutional arrangements under which service providers operate and provide services determine whether such practices will remain sustainable in the long term. Efficient billing and collection practices can set incentives for the provider to effectively charge and collect water bills while also fulfilling a commercial orientation to services.

This note draws on national and international cases to explore what it takes to implement an effective billing and collection system that encourages commercial and operational efficiencies for aiding the expansion and delivery of improved, reliable, and sustainable services. The note starts with an explanation of how poor billing and collection hurt the service provider, followed by the key principles of an effective billing and collection strategy, illustrated through national and international billing and collection practices.

Context

Most Indian water utilities[1] and service providers are under severe financial strain, with insufficient funds for routine maintenance, replacement, and expansion. Poor financial health is a result of a number of factors including inefficient operations, poor levels and/or absence of metering, poor billing and collection practices, poor structure and levels of water tariffs, increased and inefficient operational costs, and weak management.

Billing and collection systems hence are critical for ensuring financial sustainability and for achieving cost recovery, especially if a service provider is looking to expand services and improve the equity of service provision. In India, the impact of poor billing and collection is reflected through long collection periods; water boards in Bangalore and Delhi report collection periods of more than five months, while Chennai and Mumbai report even longer, at 8.6 and eight months, respectively.[2]

In India, poor billing and collection practices primarily emanate from the lack of incentives for the service provider to even charge for services being delivered and the lack of a political will to set tariffs that would allow for recovering the costs incurred in supplying the service. Most service providers do not have well-defined and proper financial records for water

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[1] In the Indian context it is difficult to draw a parallel to the common definition for a 'utility' as used in the international context. For the purpose of discussion in this paper, 'utility' is defined as an organization that is majority owned and controlled by the government and could consist of different forms, some of which may be undistinguished from the government unit that they may be part of. It could also mean a specially carved out unit in the municipal body involved with the delivery of municipal services, water being one of them.
[2] Water and Sanitation Program-South Asia's Benchmarking Project, Phase I, 2004.

Box 1: Why is Effective Billing and Collection Necessary?

The basic aim of the performance improvement series is to help water utilities and service providers understand and adopt mechanisms that promote cost recovery and sustainable revenue strategies, as well as help achieve financially viable and sustainable improved services. The objective is to be able to focus not only on specific performance improvement areas by advancing technical, commercial, and operational efficiency—such as leak reduction, billing and collection, customer service, and tariff setting, among others—but also ensure that such improvements remain sustainable and viable in the long term through arrangements such as performance agreements, monitoring, and evaluation.

Issue No. 2 focuses on the importance of effective billing and collection, the common pitfalls that their poor implementation have, and what some service providers have done to improve upon current billing and collection practices—through measures including robust recordkeeping and billing procedures, updating customer databases, outsourcing billing activities and using improved technology, and encouraging and incentivizing staff to undertake billing and collection functions more diligently.

supply and sanitation (WSS) service delivery. Many service providers also carry out responsibilities for supplying WSS services as one of the various other functions and, therefore, do not keep separate accounts for recording all activities connected with the WSS responsibility. Since they have no separate budgets or accounts for WSS services, any revenue-enhancing reforms fail to encourage and incentivize WSS staff to take forth such initiatives since financial deficiencies can be cross-subsidized from other municipal account flows. They are not incentivized to collect charges, either because of the absence of any set revenue targets or because of virtually unconditional financial support from government. Only when institutional arrangements approach water supply service delivery as a commercial endeavor will the appropriate incentives to effectively charge, bill, and collect for services be provided.

While the broader institutional environment can enhance or constrain the effectiveness of billing and collection practices, specific provider-level inefficiencies could also hamper the efficiency of such practices. Service providers may lack important internal controls for timely, accurate, and transparent billing and collection practices. They sometimes do not have updated, accurate, and complete computerized listings of the customers they are serving, thus making accurate billing almost impossible. Such mechanisms may also be ineffective because of the structure of tariffs as well as the absence of metered connections. Poor collection practices also result from a lack of willingness on the part of consumers to pay because of the poor quality of services and the poor customer care they receive, or from substandard collection systems that are cumbersome and not transparent, thus disincentivizing payment of bills.

How do Poor Billing and Collection Practices Hurt the Provider?

A Routine Exercise?

More often than not, water service providers consider billing and collection activities a routine exercise that they need to undertake; hence, they do not have a proactive attitude regarding such practices. There is an inclination towards considering that poor and inadequate services need to be tackled through the more popular issues of leakage management and rationalization of input costs, since the delivery of water services is seen more as an engineering task; no one gives finances, billing, and collection practices, among others, a second thought. However, reforms targeting revenue-enhancing strategies must emphasize that effective billing and collection practices are important if water providers are targeting full cost recovery and financial sustainability, especially for improving service quality and coverage.

Revenue Inadequacy, Poor Cost Recovery, and Poor Services

Poor billing and collection practices prevent water utilities from recovering sufficient costs to properly operate and maintain facilities and, therefore, provide adequate service to the customer. Many water utilities in the country today fail to accurately bill for every unit of water produced, either on account of the lack of any incentives to bill or for other internal factors—such as inadequate customer records, inadequate processes and systems or unwilling customers who default on payments because they are dissatisfied with the services they receive.

Increasing billing and collection rates is one of the key tools for enhancing the revenue base of the utility, achieving financial viability, and sustainability and hence registering improvements in services delivered. Service providers will need to realize that the benefits of efficient billing and collection practices on their operations is almost instant and can, in fact, improve the revenue accounts of the utility almost immediately. It is in this aspect that the importance of revenue sufficiency cannot be overemphasized.

Cost Inefficiencies

While the most significant impact of poor billing and collection practices is probably on revenue adequacy and cost recovery, thus resulting in poor standards of services, ineffective billing and collection practices also result in suboptimal results and operational inefficiencies. Given that every service provider must spend time and resources on billing and collection functions, any ineffective initiative will result in cost inefficiencies. For instance, resources may be put into computerizing and updating customer databases and customer records, but if the utility still fails to bill and collect effectively, then all efforts for updating records are wasted.

Any improvements in undertaking billing and collection practices effectively will thus help in bringing down the costs per unit of billing and collection and make such practices worth the resources that are allocated and spent. Ineffective and poorly managed billing and collection practices also impact

staffing costs and staff efficiency levels. A utility may be allocating some staff for carrying out billing and collection functions, but if such practices are not effectively targeted and do not result in improved collection efficiencies, then such efforts will have suboptimal results.

Creditworthiness and Bankability

Poor billing and collection practices that result in huge commercial losses and operating inefficiencies also hurt the creditworthiness of many water service providers, affecting their bankability and ability to tap the financial markets. Water service providers need to realize that, to deliver quality services and keep up with the fast pace of urbanization, government

grants may not always be sufficient to cover all costs for improving services. If service providers can find ways to reduce their dependence on government grants then governments could also prioritize such spending on other areas that require priority attention. Providers may need to tap capital markets for credit and, in order to do so, they will need to demonstrate financial viability and bankability and be able to meet the requisite conditions required for accessing credit. Improved collection efficiency is one of the ways in which providers can demonstrate improved creditworthiness.

Consumer Accountability

Billing inefficiencies cause inaccurate bills to be delivered to customers; they

lead to inaccuracies resulting in incorrect billing of water consumption, bills delivered to the wrong address, and so on. Such billing errors result in unwillingness on the part of consumers to pay bills regularly, given their lost faith in billing practices.
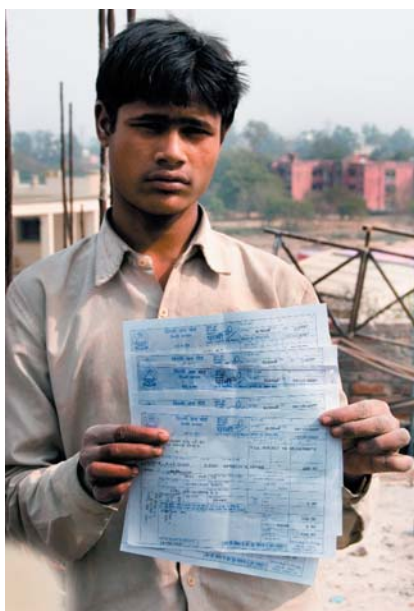
Billing errors also incur additional costs since rectifying errors requires another round of billing efforts not only for the provider (using more time and resources) but also for the consumer (who spends time in registering a complaint for an inaccurate bill). The latter imposes a load on the complaint redressal mechanisms, reducing the credibility of the service provider and weakening the accountability of the consumer to the service provider.

How can Providers Improve Billing and Collection Practices?

Urban water service providers will need to significantly improve their billing and collection practices if they are to become financially viable and sustainable for delivering continuous improvements in the quality and standard of services. While they will need to focus, at their individual level, on specific measures to ensure improvements, such efforts will remain short-lived and unsustainable unless they are coupled with institutional reform for management as well as operational autonomy and accountability.

Service providers will need to understand the principles and components that govern an effective and efficient billing system. Effective billing and collection practices depend on many internal factors that are under the control of the service provider. These include, among many others, customer databases, levels of metered and unmetered service provision, billing structures and cycles, practices and delivery, staff capacity, involvement, and efficiency in billing and collection, and facilities for customer payments. This section uses international and national case studies to determine the key principles of an effective billing and collection strategy.

Monthly Billing System Based on a Volumetric Structure

As a general rule, an effective billing system must have a billing cycle that bills customers on a monthly basis (in certain places collection is practiced daily). In doing so, water providers must accord adequate detail for also ensuring appropriate and structured monthly billing by validating bills that are raised, especially when it comes to invoicing the correct person and for the right amount. Sending a bill to the wrong person or posting inaccurate bills could push payments off by 30–60 days since all processes would need to be repeated, thus undermining the effectiveness of a monthly billing system.

The billing system should also be based on a volumetric structure such that customers are billed for the water that they consume. Thus the consumers' monthly water bill is a function of the quantity of water they use. Volumetric charges could be based on (a) a uniform volumetric charge; (b) a rising block tariff where the unit charge is specified over a range of water use for a specific consumer and then shifts as water usage increases; and (c) an increasing linear tariff where the unit charge increases linearly as water usage increases. All volumetric charging practices are based on meter readings and hence require that consumers have metered connections. Again, to ensure that such a practice remains effective, service providers will need to make sure that the meters work reliably and are read on a periodic basis (discussed in detail in subsequent sections).

Billing practices that are monthly and structured on volumetric charging are mostly absent in India. Billing practices are based on a variety of different pricing mechanisms (flat rate charging, property tax-based charging, volumetric charging or flat and volumetric-based charging) and can have different billing cycles (bi-monthly, monthly, quarterly or yearly). In cases

where volumetric charging is in use, it is often not very effective because meters may be inaccurate or may not be in use, in which case the service provider resorts to charging consumers a minimum flat rate irrespective of the volume of water that they consume.

Computerized System of Billing

A computerized system of billing and an updated and complete customer database is a must if a service provider is looking to maintain high billing efficiencies. Providers must also ensure that customer databases are updated and computerized, through robust accounting, recordkeeping, regular systematized checks, and billing procedures. In some cases across the world, as indicated in Box 2, a geographic information system mapping can help in updating customer records and for getting a robust record of all properties and hence all potential water customers. Currently such systems are almost absent for most Indian water service providers who, because of poor data in customer records, are not charging all served customers. In certain cases

Box 2: Using Geographic Information System Mapping (Durban)

Durban Metro Water in South Africa developed its geographic information system in recent years for enhancing the management of water and sanitation services to its consumers. The system involves aerial photographic surveys that are redone each year to produce up-to-date digitized maps of all properties. These maps help particularly in locating recently constructed properties in informal settlements that are otherwise unknown to the utility. This system has more than 30 different layers of relevant information that can show on its digitized computer maps details such as the precise location of all connected and unconnected properties, location of all water and sewer pipes and utility facilities, location of all water meters, records of repairs over the years on each water main, links to customer water consumption, links to customer payment records, and so on.

while customer records may be available they may not be computerized, since customer records are often maintained in log books of the various operating divisions of the provider, which are then difficult to use for keeping track of billing and payments.

Providers must focus on getting a complete computer listing of the customers they serve, by mapping and updating records not only of existing customers but also of customers who have illegally connected to the network or of people who could be connected

to a network, but are currently coping with other alternative means. As the international example in Box 3 demonstrates, accurate data and improved computer-based recordkeeping and accounting are indispensable for better understanding, monitoring, and managing of cost and revenue centers, for improving revenues and hence for moving towards financial viability. An improved customer database can also generate reliable data that can inform the decisionmaking process of the utility or service provider.

The computerized system should also allow the service provider to track customer records by its respective management unit (that is, by zone, ward, circle, district, and so on).[3] It should also allow the service provider to understand, monitor, and study historical trends so that improvements can be brought about in areas that require attention.

The system should also allow for monitoring and tracking exceptions in billing records, for instance, extraordinarily low or high consumption that may be genuine or may be a result of stopped or faulty meters, water vending practices, illegal connections tapping in, among other factors. Tracking billing exceptions will also allow for a thorough investigation for understanding the reasons behind the exception and will help in taking adequate steps for rectifying the issue.

100 Percent Customer Metering and 100 Percent Billing Based on Metering

Volumetric charging will be most effective if all connections are metered

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[3] These are different measures for administrative units that divide the operating area of a service provider.

Box 3: Computerizing Billing Systems (Burkina Faso)

Controls and measures implemented for ensuring that billing and collection activities are undertaken effectively have seen successes across the world. A utility, called **ONEA**, in Burkina Faso boasts of collection rates of over 95 percent. The water utility was restructured between 1990 and 1998 so as to create a commercially viable enterprise while expanding service to the poor and low-income areas with a commitment to ensuring that low-income groups do not pay more for services than connected households. Reforms have mostly focused on improving the performance of the public operator through internal reforms, with the signing of performance contracts between ONEA and the state since 1994.

The most recent reform process was driven by donors providing finance for the Ziga dam, a major investment to increase water supplies to the capital city Ouagadougou. Donors placed a number of conditions on efficiency and financial improvements for their involvement in this support program. One such condition was that ONEA would enter into a service contract for commercial management and the strengthening of financial and accounting information with an international water operator in association with an accountancy firm.

In 2001, a five-year service contract was granted to a joint venture between an international water company (Veolia Water) and an international auditing firm (Mazars & Guerard). The partnership focuses mainly on the strengthening of the commercial management and the financial and accounting operations of ONEA before the Ziga dam comes into operation. As part of the contract, Veolia Water is responsible for assisting in optimizing the commercial and financial management of ONEA and creating a customer services department so that customer satisfaction is improved.

For improving collection efficiency, some specific initiatives have been undertaken that include computerization of billing systems for creating and maintaining up-to-date customer databases. Monthly billing of customers is being carried out by staff who read meters at the same time, thus assisting both ONEA and its customers in managing cash flow. A number of old meters have also been replaced with more reliable and sturdier ones so as to generate bills that reflect actual consumption. As one of the key objectives was improved management of commercial operations and strengthening financial capacity, the service contract put in place specific key performance indicators that could encourage improved billing and collection efficiency, including reduction in the average time between meter reading and invoicing, increase in metered consumption and putting in place a computerized administrative system for billing, collection, receivables, complaints tracking, and accounting.

As a result of these initiatives, ONEA has seen many performance improvements including improved water supply coverage of 85–86 percent, reduced unaccounted-for water at 17 percent, improved collection efficiency at 95 percent, improved metering at 100 percent, and cost recovery at 96 percent of all costs.

Box 4: Prepaid Meters (Johannesburg)

In September 2003, **Johannesburg Water**, the supplier of water to the city of Johannesburg in South Africa, launched the ZAR 450 (US$60 million)[4] Gcin'amanzi (Keep the Water) project. The aim of the project is to improve service delivery and cut down on vast water losses in and around the Soweto area. One of the initiatives includes installation of prepaid water meters for correcting the problems caused by inaccurate water readings and billing. If the Gcin'amanzi project is implemented fully, nearly 151,000 stands in the Soweto area would have a prepayment water meter. As of early 2004, Johannesburg Water had installed 300 prepayment water meters in Phiri and 1,400 prepaid meters in Stretford Extension 4.

and all meters are in working order since the billed invoices are based on metered consumption. A successful drive of metering all water supply connections is not necessarily easy to implement since it does not depend solely on the quality of the meter that controls for its accuracy and its smooth functioning.

An effective metering practice is equally dependent on how robust the practices are such that the consumer cannot cheat the system by tampering or damaging the meters. It also depends on the repairs and replacement policy of the service provider for water meters, timely identification of faulty meters, installation of meters even in poor and low-income settlements, and so on.

As Box 4 indicates, some service providers across the world have tackled the problem of meter-based charging practices in poor communities by using prepaid meters. Since their development in the United Kingdom, these meters and their use have spread through countries such as Brazil, Egypt, Uganda, Curacao, Nigeria, Tanzania, Swaziland, Sudan, Malawi, and

Namibia. The basic idea behind the use of prepaid meters is to facilitate those who may be denied access to water because they cannot pay upfront. Water from prepaid water meters typically costs more than water billed from the utility but it gives the concerned persons the flexibility to avail of water services even if they have not made an upfront connection payment for a fixed water connection. Typically, such meters work by inserting a plastic card with a chip into the slot that is provided in the water source. In order to get more water, money can be added to the card at a convenience store. The success of such an initiative

would eventually depend on the use of appropriate technology and on the manner in which its implementation is communicated.

Service providers would also need to check on the accuracy of meters on a systematic basis so that there are no problems. In some cases meter readers have recorded on the bill whether the meter is in working condition or if there are any faults with it. It is often argued that metering fails under conditions of intermittent water supply. However, it is increasingly being proved that meters today can take care of such problems and are actually effectively working under intermittent supply conditions.

To begin with, the service provider must authorize a single point from where consumers can purchase their meters, or provide the meters themselves, so that a standardized meter as authorized by the service provider is being used. Service providers also need to have a meter checking, maintenance, and repair policy in place such that any faults as identified by meter readers at the time of meter reading can be reported and addressed. Providers should also have in place metering

checks where responsible staff could single out problem cases, especially those of incorrect consumption units recorded (data entered could indicate unrealistic consumption units such as negative units or excessive figures). The service provider would also need to set in place appropriate incentives such that meter readers actually read the meter and do not cheat the system by reporting average consumption figures at the time of meter reading. An example of how this is done is indicated in Box 5. In the end bills would need to correctly

Box 5: Hundred Percent Billing and Metering (Manila, Bangkok, and Singapore)

In 1997, **Manila's Metropolitan Waterworks and Sewerage System** was privatized. One of the concessionaires is Manila Water Company[5] that provides water and sewerage services to 5.1 million residents in Metro Manila. It has seen an increase in billed volumes of approximately 3–5 percent per year since the start of the Concession, largely because of an increase in new service connections, identification of illegal users, billing of unbilled services, and replacement of faulty meters.

The company has 100 percent metering on all service connections, which are read monthly. The reading is electronically transferred at the end of the day to the company's computer servers for billing. Payments may be made through certain banks approved by the company or through 180 payment centers such as retail outlets and selected shopping malls. Bill delivery is outsourced to third parties for most customers, but done directly by the company for large commercial customers. A round-the-clock customer service call center has also been set up to systematize the customer feedback process. The call center normally receives an average of approximately 1,400 calls per month for complaints including lack of water, leaks, and billing queries. As a result of these initiatives many improvements have been seen in the billing and collection practices of the company. Customer receivables have seen an 83 percent increase between 2000 and 2003, while the average collection period has fallen from 86 days in 2000 to 50 days in 2003.

The **Metropolitan Waterworks Authority** is the municipal utility that serves 1.7 million customers in Bangkok. It has taken impressive steps in implementing proactive and effective billing and collection practices. Bills are generated on a monthly basis and meter readers have been appointed to read meters through the use of handheld meter reading devices with portable printers, thus providing the facility of an instant bill. This enables the customer to check the amount of water charges right away after the meter has been read.

The data are transmitted through the handheld meter reading device to the Authority's server. Once the meter is read, the meter reader enters the data, checks the data entered, and then prints an invoice for the customer. The invoice is checked to see if the consumed water amount is different, that is, if it is more than 30 percent of a three-month average. If it is not, the invoice is handed over to the consumer, otherwise it is returned to the office for further investigation. The back office then undertakes a thorough investigation of the bill including a verification of the meter and, if need be, calls for a replacement of the meter. Once the correct data are confirmed, the invoice is sent to the customer by mail.

The Authority has also introduced convenient customer payment options through a multitude of choices including its own offices, bank account deductions, payment service agents, the Internet, and fixed landline or mobile transactions.

The **Public Utilities Board** is Singapore's national water authority. Over the years, it has shown impressive performance improvements—unaccounted-for water of 4.8 percent, coverage of 100 percent, staff-connection ratio of only 2.95 per 1,000, and accounts receivable outstanding at less than one month. One of the key areas of focus for improved commercial operations has been billing and collection practices. The Board currently has approximately 1.2 million utility accounts (96 percent domestic and 4 percent non-domestic)—all accounts are metered. The meters used comply with ISO 4064/1 Class C standards and are within 3 percent of accuracy. Domestic meters are placed at the entrance of the house to facilitate easier accessibility for their reading and maintenance. The Board has a meter workshop where regular maintenance, including servicing, reconditioning, and testing of meters, is undertaken.

[5] Manila Water is a consortium between Philippine company Ayala and UK company United Utilities.

include the due amounts, the number of water units consumed, any arrears, accurate customer details, and details of the concerned department that could be contacted for billing queries.

Automatic Meter Reading

Automatic meter reading is a technology that allows for automatic collection of data from the water meter and transfers it to a central database for billing.

This means that billing on actual consumption, rather than on an estimate based on previous consumption, can be calculated. Such technologies include handheld, mobile, and network technologies based on telephony platforms (wired and wireless) and radio frequency.

One of the common technologies being used by many water service providers across the world are the handheld data loggers that enable meter readers to record readings easily.

These data loggers are preloaded with a set of records or information, based on which the water meter data needs to be collected.

The data loggers also generate alerts for incorrect entries or anomalies, for instance, in case meter readers enter erroneous data or if they do not read the meter but continue to generate readings on average monthly consumption.

These data loggers give meter readers two options for generating bills:

- Spot billing, where they could generate bills on the spot and hand them over to the consumer once the meter readings are entered in

the data loggers. This helps utilities streamline and implement effective billing systems, improve cash flows, and make the processes more customer-centric.

- Batch billing, where meter readers can collect the required data and, at the end of the day, download the data in their office where the master database gets updated and

bills are generated according to the billing cycle.

As Box 6 demonstrates, both initiatives help integrate various activities being handled by several people at multiple locations into a single-window operation. This is especially useful to ease cases where meter readers would take readings of the water meter on a monthly basis at

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Box 6: Spot Billing Initiative (Hyderabad, India)

In order to encourage meter readers to generate water bills on time, the **Hyderabad Metro Water Supply and Sewerage Board**,[6] in Hyderabad (India), introduced a spot billing scheme for billing its water connections. This means that the Board has outsourced the billing function to a private party that has relevant experience in such practices and, through handheld data logger machines, can generate bills on the spot and deliver them to customers as well. The scheme has been in operation for about 70 percent of the Board's service area.

The Hyderabad Water Board was encouraged by the experiences of the Central Power Distribution Company and of AP Transco in Andhra Pradesh. Spot billing had been a success, with the billing cycle being reduced from three weeks to one day, resulting in increased cash flow for the Central Power Distribution Company, and reduced billing cycle from 45 days to 15 days for AP Transco.

Initially, this scheme was announced for the O&M division III and V in October 2004.[7] Two private agencies were deployed for generating bills on the spot, for about 0.35 million customers of the Board. The private agency is paid a service fee of US$0.05[8] as transaction costs for every bill that it generates. The Board, however, wishes to hand over the bill generation activity through spot billing to its own meter readers. Currently meter readers are being trained by the private agencies on how to generate on-the-spot bills. The Board has about 184 meter readers but feels that to do justice to spot billing practices, it will require a total of 240 meter readers. The Board is undertaking some restructuring of its current staff, and redeployment and rationalization of their work schedules, such that each meter reader can be made responsible for about 2,000 connections on average in a month.

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[6] The Hyderabad Metro Water Supply and Sewerage Board was constituted in November 1989 and made responsible for the supply of water and sewerage in the twin cities of Hyderabad and Secunderabad, covering about 72 percent of the total population under its service area.
[7] For administrative purposes, the entire service area of the Water Board in Hyderabad is divided into three circles that are further subdivided into O&M divisions, with 13 divisions spread across the three circles. O&M divisions III and V are located in circles I and III, respectively.
[8] US$1 = INR 40 (as of October 2007).

the site and then go back to office and prepare bills manually, before bills are computerized and then delivered to the customer. Following such tedious processes could discourage readers from accurately reading meters or encourage them to generate bills on average water consumption.

Innovations of using data loggers could prevent such malpractices and, at the same time, help confirm with the consumer all bill details on the spot. However, these innovations can work effectively only if utilities have updated and computerized customer databases. In some cases it is also possible to have an automated system of meter reading using wireless radio transmitters—the technology is used to not only remotely read customer meters and transfer the data into the billing system, but also to monitor and register a customer's usage.

This information is then used to calculate the customer's monthly bill. Such technology is very useful in places where manpower is expensive, as it reduces the need for meter readers to manually gather utility meter readings each month.

Box 7: Outsourcing the Billing and Collection Function (Singapore)

Billing and collection systems in Singapore are also referred to as the Customer Management System and have been outsourced by the **Public Utilities Board** (Singapore's national water authority) to SP Services. Since 1995, SP Services has been providing one-stop services for three services—water, electricity, and gas—and includes storage of master data (accounts, addresses, meter data, and so on), bills and consumption records, meter reading records, and managing abnormalities in consumption, and so forth. A consolidated bill for all three services is sent to every household account every month. However, meter reading is conducted every alternate month, with one of the months being billed on estimates.

Bills are sent within 10 days of actual or estimated meter reading and can be paid through multiple channels like checks, credit cards, the Internet, kiosk machines, ATMs, convenience stores, and the post office. SP Services collects the payment and remits it to the Public Utilities Board on a daily basis, along with a daily remittance report. A month's reconciliation is also sent to the Board and any difference is remitted or deducted from the subsequent daily remittance.

SP Services also helps the Board with debt management. It conducts a series of debt collection efforts and only when all means are exhausted does it submit a quarterly bad debt report to the Board. The debt collection efforts include calling customers, pink notices, reminder letters, and the imposition of a 1 percent monthly late charge. Only difficult cases are sent to the Small Court Tribunal. SP Services has set up customer service centers for facilitating opening or closing utility accounts, handling queries on accounts, and billing and bill payments.

Outsourcing the Billing and Collection Function

In some cases, water providers have used improved billing technologies but have actually put the entire billing and collection process in the hands of companies with proven expertise in such fields. It may serve them better since they could instead focus on the more important functions and core activities for improving quality of services. Under such outsourced models, the experts provide a fully managed service starting from bill generation and payment collection, to credit and debt management.

As Box 7 indicates through experiences in Singapore, the experts use improved technology, systems, and processes to realize improvements in billing and collection by also creating and encouraging a team that is focused on billing performance and improvement. Collections from customers are also monitored regularly by tracking revenue indicators like gain in net cash generation, new-billed revenue, costs to undertake billing and collection, and so on.

The benefits from outsourcing billing and collection include time saved and a reduced need for in-house systems and staff for billing practices.

Such a practice also helps create process efficiencies by using the latest technology, instead of relying on utility-level methods for billing and collection, which may sometimes prove to be obsolete and ineffective. Outsourcing billing and collection is generally more cost-effective since the system of competitive tendering gives the job to the most efficient and specialized providers. It also leads to better cost control since the provider knows the exact price of the outsourced services and such services can be monitored more strictly. However, if the service provider is already efficient in its billing operations, then this could mean increased costs.

Incentives for Meter Readers

Providers need to encourage efficiencies in billing practices by having a system in place that incentivizes meter readers to concentrate on effective billing practices.

First, staff members need to be redistributed so that they all have equal work pressures, instead of cases where only a few meter readers are overstretched while others are not.

If there is a perceived risk of meter readers engaging in malpractices, such as colluding with customers and fudging consumption details in the areas that they are operating, they could be rotated from time to time to avoid such risks.

Some successful utilities across the world have also incentivized their staff by linking improvements and efficiencies in billing directly to staff remunerations. In some cases meter reader remunerations could be based on how many bills have been delivered in the month and whether this is close to the actual number of bills that are to be delivered for the area that they are responsible for.

Providers need to encourage efficiencies in billing practices by having a system in place that incentivizes meter readers to concentrate on effective billing practices.

Box 8: Employee Incentives (Hyderabad and Bangalore, India)

The **Hyderabad Metro Water Supply and Sewerage Board** has been concentrating on incentivizing its staff for ensuring timely collection of bills. One of the initiatives was collection drivers on meter readers, where meter readers were rewarded US$0.025 per bill for collections made manually. Meter readers were also incentivized for collecting bills from 'Never Paid Customers' through financial rewards of 3 percent of total collections made from these customers. The Board has about 40,000 customers who have never paid their water bill and who are located mostly in circles I and II in the walled city area.[9] As of 2005, the Board has been able to collect about US$2.5 million across two years with collections from about 10,000 consumers.

Meter readers have also been set collection targets, based on current demand estimates and arrears. Meter readers are incentivized to meet these revenue targets since the chief minister of the state awards the best performing circle and division for revenue collection. To generate competition internally within the circle, the chief general manager of each individual circle ranks the divisions according to their achieved revenue realizations. As indicated in Table I, some chief general managers also monitor revenue collections for each O&M division under them on a daily basis. Indicators like daily revenue targets and the number of consumers to be contacted daily are monitored regularly.[10] The Water Board set a collection target of US$0.4 million for O&M division VII for 2005. As of May 2005, the actual collections for the entire division were US$0.23 million, which then increased to US$0.29 million in June 2005 as a result of these initiatives.

Table I: Collection Indicators for O&M Division VII, Marredpally, Secunderabad (July 2005)

Section	Monthly targets		Daily targets		Achievements (July 1–19)	
	Collection	Consumers to contact	Collection	Consumers to contact	Collection target	Amount collected
Nallagutta	25,000	3,289	825	75	15,325	6,575
HSP House	21,250	3,391	700	65	13,025	7,375
Bhoiguda	21,250	3,755	500	80	13,025	7,650
Audaiahnagar	15,000	2,496	1,200	55	9,200	7,150
Srinivasnagar	36,250	8,007	875	180	22,225	15,125
Regimental Bazar	26,250	3,111	1,000	70	16,100	11,750
Marredpally	30,000	6,236	450	140	18,375	10,025
Mettuguda	13,750	2,945	675	65	8,425	5,025
Seethaphalmandi	20,000	4,515	550	100	12,250	5,525
Tarnaka	150,000	3,802	5,000	90	91,925	70,325
Lalapet	16,250	4,059	12,500	80	9,950	8,200

Revenue collections are reported in US$, where US$1 = INR 40 (as of October 2007).
Source: Hyderabad Metro Water Supply and Sewerage Board, O&M division VII, July 2005.

[9] Each of the three circles of the Hyderabad Metro Water Supply and Sewerage Board are subdivided into 13 divisions, which are further subdivided into sections. O&M division VII (that has 11 sections) falls under circle II.
[10] There are three chief general managers who head each of the three circles of the Hyderabad Metro Water Supply and Sewerage Board, followed by the general manager who is in charge of the O&M division.

Box 8 Employee Incentives (Hyderabad and Bangalore, India) (*continued*)

Similarly, the **Bangalore Water Supply and Sewerage Board**[11] has implemented some measures for streamlining its billing practices. In a typical month, the first half of the month is reserved for billing practices with the balance month reserved for collection initiatives. There are approximately 250 meter readers, each responsible for 1,000–1,500 connections.

Reading is to be done on a fixed day for every household, and if the meter reader is unable to read the meter, it is indicated on the bill and the household is charged on the basis of average consumption over the last six months. Billing on a prefixed date also ensures that the concerned household knows that it will receive its bill on that particular day. At the time of meter reading, the reader also checks whether the meter is in working condition or not, reporting the status on the water bill. Typically, readings get translated into a household water bill on the third day from the day the meter has been read.

Once bills are generated, meter readers at the Bangalore Water Board are expected to ensure that the consumers pay their bill on time. The divisional head (executive engineer) at each Bangalore Water Board division level also sets specific collection targets for meter readers, on the basis of current demand plus 10–15 percent of arrears.[12]

Constant monitoring by the divisional head ensures that meter readers meet their collection targets. The divisional heads also use the threat of transfer for ensuring that revenue performance is up to the mark.

While this practice has been found to be successful in incentivizing meter readers for improving collections in the cities of Bangalore and Hyderabad, this is not necessarily a best practice that could be replicated elsewhere. Such practices could turn out to be dangerous for the utility or service provider since meter readers could be robbed after a day's collection.

As Box 8 indicates, utilities have set monthly targets for analyzing the performance of their various operating areas and then rewarding the best performer, thus encouraging healthy competition among different operating areas.

Constant monitoring of these targets and then rewarding the best performer could also motivate meter readers to improve billing efficiencies.

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[11] The Bangalore Water Supply and Sewerage Board is publicly owned and responsible for providing water supply, sewerage system, and sewage disposal in the Bangalore Metropolitan Area. Formed in June 1964, its service area is divided into five geographically discrete maintenance divisions that comprise 17 subdivisions and 57 service stations. The Board has a per capita supply of 100-110 liters per day.

[12] For administrative purposes, Bangalore is divided into five divisions (zones): North, South, East, West, and Central. Each divisional office is headed by an executive engineer. Each division is further divided into three to four subdivisions that are headed by an assistant executive engineer. In all, there are 17 subdivisions covering Bangalore. Subdivisions are further divided into service stations.

Service providers would need to find ways and means for encouraging the consumer to pay on time, through use of discounts and rebates for early payments, or easing the procedure for bill payments.

Box 9: Connecting Poor Populations (Bangalore, India)

In Bangalore (in the state of Karnataka, India) the water utility, the **Bangalore Water Supply and Sewerage Board**, mobilized low income communities and successfully helped them connect to the network through innovative means such as subsidized connection fees, options for group connections, and simplified and easy methods for application for a new connection. The initiative was partnered with AusAID during 2000-2002; the project's Community Development Component examined and tested options for improving service delivery to urban poor populations in three pilot slums including Cement Huts, Sudhamanagar, and Chandranagar.

Nearly 850 connections (individual and shared) were installed during the pilot phase. After successful implementation of the pilots, the Board decided to replicate the results in other slums. Today about 6,000 connections across 46 slums in the city are served with water. They receive bills and make payments willingly for getting an improved and reliable service. By connecting all slums to piped water, the Board is reducing its nonrevenue water component and hopes to slowly phase out the 15,000+ public taps that operate within city limits.

Ensuring Regular and On-Time Payments

Incentives and disincentives for customers: Billing and collection efficiencies are also hampered by illegal connections and deliberate nonpayments by customers. For tackling illegal connections, service providers would need to come up with schemes that encourage **consumers to connect legally to the network.** They could come up with schemes for regularization of connections by offering a rebate on the connection fee. In other instances, poor people may tap the network because they have to cope with intermittent supplies at public standposts and taps. In such cases the utility would need to find innovative

Box 10: Credible Disconnection Policy (Manila, Bangkok, Bangalore, and Hyderadad)

Manila Water has a credible disconnection policy whereby customers who are in arrears for 60 days after a due date are given warning notices prior to disconnection. As of December 31, 2004, about 63,837 connections had been disconnected. Of these disconnections, about 70 percent were later reconnected.

Bangkok-based **Metropolitan Waterworks Authority** has a credible disconnection policy in place for unpaid bills. A customer is given 12 days to pay the bill, after which a duplicate copy is sent as a reminder. In case the bill still remains unpaid for the next 15 days, the inlet valve is sealed and a fine of US$3.35 is imposed.[13] In case the bill is still unpaid for the next 15 days, the meter is taken off and a fine of 10 percent of the connection fee is imposed. In case of further non-payment for the next three months, the customer will have to apply for reconnection and pay a fine of 25 percent of the connection fee. For any time period beyond this, the case is considered as a new connection and the customer would need to pay fresh connection fees for taking a connection.

In Bangalore, the water utility, **Bangalore Water Supply and Sewerage Board**, has a disconnection policy whereby connections are initially clamped off at the street level, after which legal notices are sent. In the event that no action is taken, the Board could resort to disconnection. While this policy does exist, the Board does admit that it is not used very often.

In Hyderabad, too, a disconnection policy for penalizing customers who either default on payment or have tampered with their meters is in place. A fine of US$1.25 per month has been imposed on those who have faulty meters and who have failed to repair their meters. In case of continuing default, meter readers along with disconnection staff of the **Hyderabad Metro Water Supply and Sewerage Board** are authorized to disconnect. They sometimes also clamp the connection at the street level, and in case this does not work, then resort to disconnection. However, the Board acknowledges that its disconnection policy is not used much.

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[13] 1 Thai Baht = US$0.0334 (as of November 2007).

means for connecting poor populations to the network, like using subsidized connection charges and/or an installment system for making payments for connecting to the network. Such innovative practices were used in Bangalore, in the state of Karnataka, India (see Box 9) for mobilizing low income communities so that they could connect to the network.

For continuous default and nonpayment or in cases of illegal connections, using sanctions, such as **water connection cutoffs,** should be exercised. Such practices are, however, sometimes not exercised aggressively since water is usually seen as a basic human right. Political pressure may also prevent service providers and force them to keep water services flowing even if the consumer is not paying. Some water companies (Box 10) have used credible disconnection policies and have been able to exercise this sanction more often for defaulting and illegal

consumers. Water utilities could send a notification for payment and, if not adhered to, resort to then cutting off the water connection.

Utilities and service providers could also design **incentive schemes for customers** who have huge arrears in their bills. Discounts, installment facilities for payment, and so on, could be designed such that customers are encouraged to settle their bills once and for all and start afresh. As described in Box 11, utilities could also use disincentives for late and irregular payments through disconnection of water connections, imposition of heavy fines, and so forth, that deter consumers from such habits.

Customer conveniences to pay: Water service providers must encourage consumers to pay on time for services by simplifying the payment process.

Water service providers need to set up payment agreements for customers to pay at banks, post offices or

convenience stores, or put up their own conveniences for easy bill payments such as customer care centers, collection centers, online payment facilities, and so on.

Service providers would need to find their own localized solutions for catering to customer needs. Customers could be offered online payment options through payment gateways, the Web or interactive voice telephony, call centers and one-stop shops for payment of utility bills, and over-the-counter payment options at post offices or banks by check or direct debit. Incentives could also include raffles and lucky draws for customers who are more up-to-date with payment of bills.[14] While setting up centers for facilitating the collection of water bills, providers need to keep in mind that these should be convenient for the consumer.

The location of the centers should be planned so as to serve the entire service area and should be located at prominent places that are convenient to access. These could be located at the ward or subdivision level since they cover a reasonable geographical area, with ward offices located at a central point in the ward that consumers are well aware of.

Such centers would also be well accepted if they replace previous systems that require consumers to queue outside a small window and wait for long hours before being able to make a payment. Collection centers could be made more comfortable with waiting areas and basic facilities such as drinking water and toilets.

Box 11: One-Time Settlement Scheme (Hyderabad, India)

The **Hyderabad Metro Water Supply and Sewerage Board** devised an incentive scheme for its customers through its One-Time Settlement scheme. This applied to customers who had huge arrears in their bills. A close look at the billing statistics of the Board revealed that there were as many as 0.28 million customers who had not paid their water cess to the Board.

To encourage customers to settle their arrears, the Board launched the scheme in June 2004, giving a discount of 10 percent to those who would pay their water cess arrears upfront. Alternatively, an installment facility of 10 installments was made for those who could not make upfront payments of arrears all at one time. There was a huge response to the scheme with a record collection of US$4.71 million in June 2004, the highest-ever recorded in the history of the Board. The scheme, which was due to expire in August 2004, was later extended till September 2004. The collection in September 2004 was also high, totaling US$4.16 million and an all-time high of 0.16 million customers.

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[14] The lucky draw or raffle would have the water bill number or account number as the ticket number.

The service provider would also need to keep in mind the poorer sections of society while devising such conveniences. Options such as installment payments, payment centers situated at convenient locations, and other innovative means would need to be devised for ensuring that poor people are encouraged to take individual connections and keep paying for them so that their connections stay running. As the cases in Box 12 demonstrate, water kiosks, Electronic Clearing Service systems, household e-banking facilities, and e-governance initiatives have provided citizens with hassle-free means for paying their utility bills in Bangalore and Hyderabad.

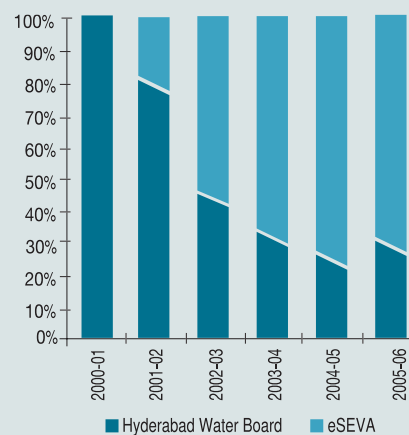## Box 12: Customer Conveniences (Hyderabad and Bangalore, India)

Consumers in Hyderabad today have the convenience of paying water bills either through eSeva or through the **Hyderabad Metro Water Supply and Sewerage Board's** collection counters. eSeva is an e-governance initiative that provides citizens with an easy and hassle-free way of paying their utility bills. Currently, about 70 percent of the Board's water bills are received through eSeva, details of which are discussed in Box 14. Besides eSeva, the Hyderabad Water Board is also operating 15 of its own counters for collecting water bills as against an original total of 75 centers. The Board also recently reopened 10 more counters in response to requests from consumers in areas where there are no eSeva counters or in areas where eSeva counters have heavy demand. Partnering with eSeva has resulted in significant benefits for the Board.

- **Increase in bill paying customer base:** Tying up with eSeva has resulted in an increase in the Board's bill paying customer base. In 2000–01—when the Board was doing its own bill collection—0.657 million transactions were recorded. The number of bill payment transactions has progressively increased, from 0.779 million in 2001–02 to 1.403 million in 2004–05, with a majority being paid through eSeva (75 percent of transactions in 2004–05).

- **Rise in revenue collections:** The Board has also seen a rise in its revenue collections, from US$23 million in 2000–01 to US$46 million in 2004–05, with the proportion of collections through eSeva increasing progressively from 19 percent in 2001–02 to 44 percent in 2004–05. However, bulk consumers, accounting for 35–40 percent of total collections still make payments through the Board's own collection system since eSeva does not offer its services to bulk consumers.

- **Cost saving on operation and maintenance of collection centers:** Prior to eSeva, when the Board had its own collection centers, it incurred US$0.25 per transaction as costs of operation. However, at present the Board is paying only US$0.125 to eSeva for each transaction, thus halving its transaction costs.

- **Focus on billing activities:** Discussions with officials at the Board revealed that collection staff have been reallocated to undertake more stringent billing activities.

Proportion of Total Collections: Hyderabad Water Board and eSEVA

Legend: ■ Hyderabad Water Board ■ eSEVA

Proportion of Utility Bill Transactions between the Hyderabad Water Board and eSEVA

Legend: ■ Hyderabad Water Board ■ eSEVA

Box 12 Customer Conveniences (Hyderabad and Bangalore, India) (*continued*)

In Bangalore, the water utility **Bangalore Water Supply and Sewerage Board** has created customer conveniences where consumers can pay bills through a variety of options such as water kiosks, Electronic Clearing Service systems, and household e-banking facilities. It is one of the first cities in the country to install 70 kiosks to help consumers pay their bills. Each machine costs approximately US$13,500 (which includes the cost of maintenance for six years) and works as follows: each water bill is provided with a bar code, which when held over the bar code reader, reads the bill detail. The consumer can pay the bill either by check, demand draft or cash.

Monthly water bills can also be paid through the Electronic Clearance System through which 11,500 water connection payments are currently received. About eight days prior to the due date, the bill is sent to the consumer's concerned bank, which then informs the consumer of the bill, makes the payment on his/her behalf, and credits the amount to the Water Board. *Bill Junction*, a facility that allows consumers to pay all their utility bills together, also facilitates consumers in paying bills in Bangalore. The service manages the utility bills of consumers. At present about 1,000–1,500 water bills are paid to the Board through this service. The Board has also tied up with banks, for example, CitiBank, where bank account holders can pay their bills through their respective banking accounts.

Box 13: Water *Adalats*

Water *adalats* [literally, courts] are used in Hyderabad and Bangalore to resolve long-standing issues and complaints related to service delivery. Consumers are usually informed about water *adalats* through all the major English and vernacular newspapers; they are required to register their complaints or cases in advance to facilitate collection of required information and documents from the concerned zone or circle of the water utility so as to ensure speedy complaint resolution.

While the utility in Bangalore convenes *adalats* once a month on a predesignated day at all its 20 subdivisional offices, the utility in Hyderabad convenes them on a monthly basis, on the first Saturday, at its headquarters in Khairatabad. A majority of the cases registered under water *adalats* are related to billing problems (including cases of excess billing, discrepancy in billing and account finalization, nonreceipt of bill, and irregular meter reading).

(See Issue No. 4 in the series for more details.)

Resolving Customer Grievances

A call center is a must to ensure that a customer focus in service delivery is maintained. Such centers help service providers to respond to consumer grievances in a speedy, appropriate, and efficient manner by receiving constant feedback about the services that they are providing.

Such mechanisms have helped service providers identify and review issues that affect interests of customers and, at the same time, ensure that they are aware of, and responsive to, concerns and complaints about their services. Round-the-clock customer care grievance phonelines, e-governance redressal mechanisms, and so on, could facilitate in redressing long-standing grievances regarding consumer billing disputes. In some cases, consumer courts and water *adalats* [literally, courts] (see Box 13) are also used whereby consumers and the utility staff can resolve long-standing issues and complaints.

Implementing e-governance initiatives would require the service provider to find innovative ways of kickstarting the initiative through private sector participation for sharing costs with the private partners.

Box 14: Integrated Service Delivery Centers through eSeva (Andhra Pradesh, India)

eSeva is an e-governance initiative of the Department of Information Technology and Communication, Government of Andhra Pradesh, which provides integrated services in urban areas with the objective of simplifying collection procedures by providing citizens with a one-stop shop for a variety of Government to Citizen and Business to Citizen services.

The service has no jurisdictional limits, with any of the offered services availed of at any center in the city or district. It has longer working hours and is operational even on holidays. Citizens are also offered a variety of payment modes including cash, check, demand draft or credit card, and online only for paying water bills, electricity bills, and property taxes. At present, eSeva has 43 centers across the twin cities of Hyderabad and Secunderabad, and 273 Integrated Service Centers in the remaining 116 municipalities in the state, offering 150 services of 15 state government departments and two central government departments, and 12 private sector companies. eSeva follows closely on the lines of eCitizen, an e-governance initiative of the Government of Singapore.[a]

Implementation model: The initiative was implemented in three phases, with the first phase being a pilot phase—the Twin Cities Integrated Network Services—initiated in December 1999 in ward No. 8 of the Municipal Corporation of Hyderabad to serve about 1,000 citizens a day and covering eight services.[b] Given the pilot's success—within the first five months, about 15,700 transactions were recorded—the state government decided to replicate the initiative in the twin cities of Hyderabad and Secunderabad. The project was renamed eSeva and launched in August 2001.

The initiative was further scaled to the districts to cover the remaining 116 municipalities through 230 citizen service centers. From a department-centric system where citizens had to visit numerous departments for paying various utility bills, eSeva thus introduced a customer-centric approach, sparing customers the hassle of dealing with multiple administrative departments, intermediaries, and corruption in government departments.

The prerequisite for government departments to join the service in the pilot phase was the presence of an online database system and the readiness to allocate surplus bill collection staff to man the eSeva centers. The services were provided by connecting databases of respective departments using Integrated Services Digital Network lines on real-time basis. Two private technology companies developed the application software and maintained the backend databases. Given the scale of replication in the twin cities, the initiative was then implemented on a Public-Private Partnership through a 'Build, Operate, Own, and Transfer' model for a five-year period, where the private technology partners provided the necessary hardware and developed and maintained the interface software.

The private partners were also responsible for providing human resources required to man the eSeva centers, for which they were reimbursed separately by the state government. The replication in the districts had similar institutional arrangements, with three private technology partners chosen in September 2002 for setting up district data centers, installing hardware and the network, and maintaining the citizen service and data centers thereafter. The state government met the entire project cost for all phases and facilitated the provision of the building and infrastructure required for the citizen service centers and the data center.[c]

Technical arrangements: The entire network is based on a three-tier network, each center has counters with computers loaded with menu-driven software that can process multiple types of transactions. Each center connects to the central data center using a leased line with a back-up of an Integrated Services Digital Network line at the first tier. The respective departmental servers are connected to the central data center set-up at the second tier with leased lines and back-up Integrated Services Digital Network lines. The main data center in the twin cities is located in Khairatabad while in the districts the central data center is located in the district headquarters. Departments maintain their updated databases at the third tier. Payment particulars are updated on departmental servers on a real-time basis.

Financial arrangements: The total project capital cost was approximately US$13.3 million, of which the state government invested approximately US$7.6 million[d] and the private partners bore the remaining US$5.7 million capital investment. Total O&M costs of the initiative works to approximately US$4.3 million per year.

A revenue model for transaction costs that would cover capital and O&M costs was also devised and was arrived at based on the anticipated volume of transactions vis-à-vis capital and operating costs and the term period of the partnership. Technical partners, while submitting bids, had to quote expected transaction costs for operation and final rates were based on their lowest quotes.[g] Transaction fees charged to the departments that sign up for the service are based on service charges for Government to Citizen and Business to Citizen transactions on revenues from advertisements over the Internet, and on receipts issued to citizens, and varied with the nature of transactions[h] and geographical area.[i] The rates for service charges are indicated in the following table on transaction fees:

Project Costs of eSeva	Rate	No.	Total Costs
PROJECT CAPITAL COSTS			
PILOT PHASE			
Central data center: Building, interiors, and hardware	0.13	1	0.13
eSeva center: Building and interiors	0.04[f]	1	0.04
Hardware development	0.04		0.04
Software development	0.05		0.05
Total capital cost—pilot phase			**0.25**
REPLICATION IN TWIN CITIES			
Central data center: Building, interiors, and hardware[e]	0.13		
eSeva center: Building and interiors	0.04	42	1.58
Hardware development	0.01 per center	42	0.53
Software development/customization	0.05		0.05
Total—replication phase (twin cities)			**2.15**
REPLICATION IN DISTRICTS			
Central district data center	0.10	21	2.10
eSeva center	0.03/center	230	5.75
Hardware	0.01 per center	230	2.880
Software customization	0.13		0.13
Total—replication phase (twin cities)			**10.85**
TOTAL CAPITAL COST			**13.25**
YEARLY O&M COSTS			
REPLICATION IN TWIN CITIES			
O&M cost: eSeva center[f] (monthly)	US$1,250/center	43	0.645
O&M data center (monthly)	US$375/CDC	1	0.045
REPLICATION IN DISTRICTS			
O&M cost: eSeva center (monthly)	US$1,250/center	230	3.45
O&M data center (monthly)	US$325/DDC	21	0.083
TOTAL YEARLY O&M COST			**4.223**

Notes: All numbers in the table are in US dollars, unless otherwise indicated. US$1 = INR 40 (as of October 2007).

Box 14: Integrated Service Delivery Centers through eSeva (Andhra Pradesh, India)

Transaction Fees for Replication Phase in Twin Cities and Districts

Phase II: Replication in Twin Cities—Hyderabad and Secunderabad

		Fee per Transaction (in US$)
Utility bills/tax payments	US$0.125	US$0.125
	Private partners' share: US$0.12 (for first 18 months, <0.36 million trans.)[j]	Private partners' share: US$0.1 (after first 18 months)[k]
Paper-based transactions	US$0.25 (private partners' share)	
Payments through Internet	US$0.2125 (private partners' share)	
Reservation of tickets	US$0.2 (private partners' share)	
Filing of applications	US$0.2 (private partners' share)	

Phase III: Replication and Scaling in Districts

Zone	Districts Covered	Fee per Transaction (in US$)
Utility bills		
I Srikakulam, Vizianagaram, Visakhapatnam	US$0.164 (<0.35 million)	US$0.128 (>0.35 million)
II East Godavari, West Godavari, Krishna	US$0.16 (<0.5 million)	US$0.135 (>0.5 million)
III Guntur, Prakasam, Nellore	US$0.188 (<0.3 million)	US$0.131 (>0.3 million)
IV Chittoor, Anantapur, Kurnool, Cuddapaah	US$0.163 (<0.42 million)	US$0.131 (>0.42 million)
V Warangal, Karimnagar, Khammam, Adilabad	US$0.188 (<0.3 million)	US$0.131 (> 0.3 million)
VI Medak, Mahaboobnagar, Nalgonda, Nizamabad	US$0.213 (<0.15 million)	US$0.149 (> 0.15 million)
Paper certificates (all districts)	US$0.25/transaction	
PVC transactions (all districts)	US$1.575/transaction	
Tickets (all districts)	US$0.225/transaction	

Notes for Box 14

a. eCitizen is an initiative owned by the Ministry of Finance and managed by the Infocomm Development Authority of Singapore and provides a single access point to all government information and services, including Arts and Heritage, Business, Defense, Education, Elections, Employment, Family, Health, Housing, Law, Library, Recreation, Safety and Security, Sports, and Transport and Travel.

b. These eight services included payment of electricity and water bills, property tax, registration of births and deaths, issuance of birth and death certificates, reservation of Andhra Pradesh State Road Transport Corporation tickets, and issuance of driving licenses.

c. The project costs included the expenditure towards software, hardware, manpower, and maintenance expenses. The buildings provided for the service belong to the Municipal Corporation of Hyderabad.

d. Including US$0.25 million for the pilot project; US$1.575 million for the provision of building and infrastructure for eSeva centers in the twin cities, and US$5.75 million for eSeva centers in the districts.

e. No additional cost as the data center of the pilot phase was used.

f. Including cost for security, communication, housekeeping, office boy, engineer, consumables, maintenance of equipment, and stationery.

g. The state government or Information Technology and Communication Department had not undertaken any independent assessments on appropriate transaction costs. Since the average cost of operating an eSeva center per month is US$1,250 and the average number of transactions recorded in each center is 15,000, the actual cost incurred per transaction is US$0.08.

h. Different charges were imposed for utility bills, tax payments, ticket reservations, paper-based transactions.

i. The transaction costs were different for the twin cities, as was the case for the different zones in the districts.

j. and k. This refers to the distribution of revenues between the private partner and eSeva. Every department that signs up with eSeva pays a fee to eSeva for facilitating the process. A set of revenue-sharing formulas for sharing these fees were established between the technology partners and the government, based on the volume of transactions and the time that has elapsed from the initiation of the initiative (before 18 months and after 18 months). For utility bills and tax payments for the first 18 months with less than 0.36 million transactions, US$0.119/transaction was the share of the technology partner and US$0.00625/transaction was the government's share. At the end of the first 18 months, irrespective of the number of transactions, US$0.9875 was the technology partner's share and US$0.026 for the government. This differential revenue-sharing formula was aimed at encouraging private partners and enabling them to recover the investments made.

Addressing Institutional Issues

While effective billing and collection practices depend on many internal factors and these could be addressed directly at the service provider level, the institutional arrangements under which operators operate and provide services determine whether improvements in billing and collection will remain sustainable in the long term.

Improvements in billing and collection activities, especially in the Indian context, will need to be implemented through specific provider-level interventions, addressed in light of overall institutional issues that currently discourage water supply and sanitation service providers from effectively charging for water.

Hence, even though these issues are sometimes out of the immediate control of the provider, they will need to be addressed for ensuring that the provider-level initiatives for improving

billing and collection practices remain sustainable in the long run.

Ring Fencing Accounts

Isolating water supply and sanitation activities and creating separate revenue and cost accounts is fundamental if improved billing and collection are to have a favorable impact on services. This will help water supply and sanitation managers appreciate the financial impact that improvements in billing and collection activities can have for the delivery of more efficient services. Ring fencing will also force providers to be more financially accountable for services, ensuring that revenues obtained from water supply and sanitation functions are truly spent on the same services.

Hard Budget Constraints

Service providers would also need to operate under conditions of a hard budget constraint, where they are finally made financially accountable for revenue deficiencies. It is often wrongly assumed that this means that they should be financially fully self-sufficient. That is not the key issue—in many countries local governments or utilities benefit from intergovernmental transfers, but they still operate under a hard budget constraint because they have to budget effectively and then operate within the budgets.

The problem in India is that state governments often bail out local bodies, or intercept debts even without the local body knowing that they do so. This absolves the local body from taking responsibility. The challenge is then to ensure that even where such bodies receive government transfers, these could be made available only if they operate efficiently.

Conclusion

While broader institutional-level decisions need to be undertaken for incentivizing water service providers to become more financially accountable, there are some interventions targeting reduced commercial losses that need to be undertaken at the provider level to produce revenue enhancements that will contribute in bringing about sustained improvement of services.

Tariff adjustments are sometimes considered one of the main factors impacting cost recovery. But providers will need to realize that pricing of water remains a contentious issue and is often outside their control, although they should have the means and capacity to defend the case of an efficient, self-sustainable entity. Instead, implementing effective billing and collection practices can bring about an almost immediate impact on revenue streams.

The case studies indicate that any successful billing practice must ensure that bills are raised on a monthly basis and should be volumetric-based, such that customers pay for what they consume. This makes it mandatory for the service provider to adopt 100 percent metering of all its customer connections. Service providers must realize that an effective billing and collection system that rides on these principles can bring about immediate improvements in revenue streams. However, to ensure that such practices remain effective, it is absolutely essential that providers have updated, robust, and computerized customer databases such that the billing function can be easily implemented.

Some of the cases demonstrate that using improved technology, like spot billing, could further ease the billing function, thus improving collection efficiencies and eventually revenue streams. The cases also demonstrate the importance of outsourcing or putting certain essential processes, like billing and collection, in the hands of companies that have proven expertise in such fields, which in turn enabled the provider to focus on the more important functions and core activities for improving quality of services.

In the international examples, especially, such functions are outsourced to a separate company that remains wholly responsible for the entire billing and collection function (including debt management) either through service contracts that are adopted only for this, or through other contracting forms where the entire service obligation is outsourced to a third party (see Box 15).

The case studies also demonstrate the importance of realigning staff members and their job responsibilities so that they could perform their job more adequately. One utility opted to balance meter readers' time and work schedules between billing and collection activities. Staff members were also redistributed so that they had equal work pressures, unlike previously where only a few meter readers were overstretched in achieving their set revenue targets while others were not.

The cases demonstrate the importance of using performance incentives for improving billing and collection practices, by linking remunerations directly to efficiencies as achieved by

Box 15: Outsourcing of Billing and Collection

Typically, billing and collection practices are outsourced through *service contracts* where the public authority retains overall service responsibility, except for the specific components that are contracted out to the private party. Payment to the private party is usually made on a lumpsum basis depending on it achieving certain agreed targets.

Other forms of contracting are management and affermage contracts that attempt at ensuring improved management of service delivery operations by outsourcing overall operations to the private operator. These contracts introduce greater incentives for efficiency by defining performance targets and linking part of operator fee to the fulfillment of performance targets. The incentives come in the form of financial rewards and are based on targets being achieved. The fee structure creates incentives to increase productivity and encourages efficient performance, since payments are received contingent on meeting operational and commercial efficiencies.

In Senegal's case, an affermage contract included specific and time-bound targets covering areas of operational efficiency, billing and revenues, service extension, service quality, customer services, and capacity building. Bill collection improved from 91 percent to 97 percent, due in part to government starting to pay its bills as well as a strict disconnection policy for disconnecting those who defaulted in making regular payments.

water supply and sanitation staff. If the targets were achieved, staff members were rewarded financially or were recognized for being part of the best operating division. Such initiatives for creating peer pressure generated healthy competition for improved revenue performance and overall increases in revenues for the water boards.

Water utilities also need to create incentives and disincentives so that consumers make payments on time. Imposition of fines, partial disconnection, and a complete cutoff of the connection can be used by water service providers to put in place credible threats for defaulters and illegal connections. Customers could be encouraged to pay on time through the use of discounts and rebates for early payments, or easy payments of bills for consumers through options like customer centers, collection centers, online payment facilities, and so on, through facilities like kiosk machines, Electronic Clearance Systems, Internet

banking facilities, and integrated service delivery initiatives.

Some of the cases showcase that implementing e-governance initiatives would require the service provider to find innovative ways of kickstarting the initiative through private sector participation for sharing of capital and operating costs with the private partners. Technical arrangements for such cases would, however, need to give special attention to the entire software development process. In fact, such initiatives should not be implemented in a hurry without complete re-engineering of back-end processes of all participating departments.

The importance of robust, high capacity servers and network bandwidth for growing volumes of transactions is also absolutely essential so that delays and long waits during peak hours can be avoided. Some of these initiatives could also be implemented through a contract that leaves no room for

ambiguities in contract specifications. Some service-level agreements with private partners could be put in place so that service quality that has to be achieved by the private party could be monitored.

This note indicates that there are many elements to implementing improved billing and collection practices that could be adopted by service providers. However, if these initiatives are to remain sustainable, they will have to be addressed in the overall institutional context that brings in a commercial culture for providing the appropriate incentives to effectively charge, bill, and collect for services provided. When a billing and collection system functions well, it not only generates increased revenues that can help improve services, it also capacitates the generation of reliable data that can inform the strategic planning process of the service provider for ensuring that such improvements in services remain sustainable in the long run.

ABOUT THE SERIES

WSP Field Notes describe and analyze projects and activities in water and sanitation that provide lessons for sector leaders, administrators, and individuals tackling the water and sanitation challenges in urban and rural areas. The criteria for selection of stories included in this series are large-scale impact, demonstrable sustainability, good cost recovery, replicable conditions, and leadership.

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