

Research Paper

The impact of pro-poor interventions on the performance indicators of a water utility: case studies of Nakuru and Kisumu

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ABSTRACT

Water utilities have been confronted with the conflicting mandates of expanding services to all, including low income areas (LIAs), while attaining and preserving financial sustainability. In the pursuit of striking the balance between these two, often conflicting mandates, the expansion of services in LIAs has been lagging behind. Typically, the expansion of services to these areas is associated with low collection rates, vandalism of infrastructure or unordered urbanization. Using the case of two pro-poor units in Nakuru and Kisumu, Kenya, this research analyses the impact of these interventions in the operational performance of the utility. The utilities have been able to increase coverage while reducing non-revenue water (NRW) and improving collection efficiency. We realize, as others have earlier indicated, that these achievements are reached as the utility has opted for a differentiated level of service that prevents dwellers of LIAs accessing higher levels of services such as household connections. These interventions should not be seen as an end-state of water service provision in these areas. However, these pro-poor units seem a valid strategy for the utility to fulfil these mandates for the time being.

Key words | financial sustainability, low income areas, pro-poor interventions, social responsibility, water utilities

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INTRODUCTION

In 2015 more than 844 million people still lacked access to a basic drinking water source (WHO/UNICEF 2017). In the Global South, this situation has been exacerbated by rapid urbanization, particularly in peri-urban areas, access to shelter, social amenities, and weak local governments (Watson 2009). The sector has made efforts to readdress this situation by making financial resources available through national and international (non)governmental organizations, investing in capacity-building programmes or technology transfer (UNDESA 2015). However, multiple factors challenge the efforts made by utilities in expanding services to low income areas (LIAs) in cities (Adams & Zulu 2015). These challenges include: insecure and uncertain land tenure

preventing water utilities from entering into formal contracts with the dwellers in these areas; the lack of 'permanency' due to high transitional populations; and the lack of spatial planning which makes it difficult for utilities to pass water pipes in LIAs (Adams & Zulu 2015). Other challenges revolve around the perceived degree of vandalism of water assets such as water meters and water pipes in peri-urban areas, which makes utilities lose interest in extending water services to peri-urban areas (Bakker *et al.* 2008). Moreover, water utilities hesitate to extend service coverage to LIAs because they suspect the urban poor are unable or unwilling to pay for regular water bills, connection fees and other materials (Adams & Zulu 2015; Marson & Savin 2015).

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In addition to the complex external conditions utilities have to work in, water providers also face internal challenges. These factors usually originate from the governance structures in place and operation and management practices implemented in the utility. Limitations range from the lack of sufficient information on the preferences of users in LIAs or the lack of financial resources allocated to invest in piped water infrastructure to the high transaction costs of developing water services associated with long procedures and petty corruption (Lobo 2008). Water utilities have no financial incentives to provide water to poor peri-urban areas given the financial requirements to expand infrastructure, paired with there being no guarantee that full cost recovery practices can be applied (Adams & Zulu 2015; UNDESA 2015). Indeed, water utilities are increasingly governed by principles of moderate to full cost recovery (Marson & Savin 2015). As a result of the general endorsement of the Dublin Principles (ICWE 1992), it is now widely accepted that water should be considered as an economic good and, therefore, subject to cost recovery in order to ultimately ensure financial sustainability (Rogers *et al.* 2002; Savenije & van der Zaag 2002).

The proportion of the population with access to at least basic drinking water services in sub-Saharan Africa has increased to a small 1% from the year 2000 to 2015 (WHO/UNICEF 2017). Furthermore, people with access to improved piped water on premises has decreased significantly from 43% in 1990 to 33% in 2015. This result is partially attributable to a change in the paradigm of providing water and sanitation services to the underserved in urban and peri-urban areas (Mara & Alabaster 2008). Increasingly, water utilities opt to expand services through community or shared water points rather than individual household connections. According to Mara & Alabaster (2008), typical examples of these strategies are the well-established practices of water kiosks, public water points or community shared yard taps. As a result, utilities provide different levels of service to their users (Susantono 2001; Bakker *et al.* 2008; Schwartz & Sanga 2010; Schwartz *et al.* 2017). Depending on the choices made the users may experience different levels of service ranging from 'no access' or less than 5 L per capita per day to 'basic', 'safely managed' access (WHO/UNICEF 2017). The difference between these levels of service can be translated into

convenience of service in terms of the time required for obtaining water (e.g., 30 min round-trip to source to multiple taps within one house) and water availability (e.g., from 20 to 100–200 L per capita per day). Although these strategies have become more popular, providing water to LIAs will only be realized if the internal and external factors that hinder the water utility from expanding services are addressed.

The existence of financial requirements overlapping with social mandates of utilities poses a challenge that has been widely documented (Schwartz *et al.* 2017). Ensuring financial sustainability while implementing pro-poor interventions may seem contradictory as water utilities increasingly face losses (commercial and physical) in expanding services to LIAs. Stringent cost recovery mechanisms may not lead to better services, but rather create distrust between the user and the utility (Peters & Oldfield 2005). Others argue that water utilities will always depend on external financial resources from governments and donors to expand services to LIAs as applicable tariffs in these areas are too low (Schwartz 2008). Although moderate levels of cost recovery (e.g., only recovery of O&M) have been shown to have a positive correlation with increased coverage, high levels of cost recovery (including capital expenses and other costs) appear to lead to lower levels of coverage expansion (Berg & Mugisha 2010; Marson & Savin 2015).

In this article, we attempt to nuance both streams of literature that highlight the complexities of achieving increased coverage rates in the LIAs, while achieving financial sustainability. We discuss how the creation of a separate unit within utilities has supported utilities in breaking the vicious circle created by the internal and external hurdles in providing water services in LIAs. We do this by providing data based on two cases in Kenya that show how, through the construction of pro-poor strategies, water utilities are able to strike a balance that allows them to achieve their social mandate in LIAs without putting the financial performance of the utility in jeopardy.

METHODOLOGY

The fieldwork was carried out in Kenya from November 2015 to February 2016. This research combines quantitative

and qualitative data collection and analytical methods. Data were mainly collected through in-depth semi-structured interviews with stakeholders in Nairobi representing national governmental agencies, as well as in the two case studies in Nakuru (Nakuru Water Supply and Sanitation Company Limited – NAWASSCO) and Kisumu (Kisumu Water and Sewerage Corporation – KIWASCO). The semi-structured interviews were complemented by collection and review of secondary data from reports produced by the utilities studied.

The choice of cases was motivated by the fact that both utilities had a long established pro-poor unit that had been implementing interventions through partnering with small-scale providers or through the establishment of water kiosks in Kisumu and the installation of pre-paid water meters managed directly by the utility in Nakuru. Furthermore, the two cases were chosen to assess how different locations affect the pro-poor interventions decided upon by the utilities. We enquired about the planning and implementation of pro-poor strategies within the utility, including how these matched and fit in with their current strategies and organizational structures. This included enquiries regarding the formation of the pro-poor unit itself. This was done in order to understand the priorities and trade-offs utilities are dealing with to serve the urban poor and achieve financial sustainability. In this step we also tried to understand how water utilities perceive and manage the internal and external factors that hinder expansion of services in LIAs. The performance indicators for which data were collected include: water coverage, hours of supply, revenue collection efficiency, cost recovery, non-revenue water reduction and metering ratios. Data on these indicators were collected for the past 8 years.

For this study, we have focused on understanding the inside workings of an organization as we believe that the strategies for service expansion are a result of negotiations within the organization. These negotiations occur within departments (Albert & Whetten 1985), as well as negotiations of the utility within its operational context (institutional environment) (North 1991). However, we have not included in this study the analysis of the impact on, and perception of impact by, the users on the interventions initiated by the utility.

THE EXPANSION OF WATER SERVICES IN LIAS OF KISUMU AND NAKURU

Establishment of pro-poor services in Kenya

The Ministry of Water and Irrigation (MWI), through the Water Act 2002, established the Water Services Regulatory Board (WASREB) with the mandate to oversee the implementation of policies set by the MWI, including the National Water Services Strategy and Pro-poor Implementation Plan (NWSS and PPIP). These two documents pay specific attention to the underserved LIAs. In its role as regulator, WASREB issues licenses to Water Service Boards (WSBs) to make sure that consumers, including those in LIAs, have access to sufficient, affordable and sustainable water services. WSBs transfer these requirements to the water service providers (WSPs) through their service provision agreements. In 2004, the Water Services Trust Fund (WSTF) was created. The WSTF pools financial resources to fund the development of water and sanitation service projects in underserved LIAs. The WSPs are entitled to apply directly to the funding programmes of the WSTF. However, as part of the devolution process by which Kenya is devolving responsibilities to county governments, these funds may be granted directly to the county governments who would subsequently transfer them to the WSPs. Other actors, such as master operators (MOs) or water kiosk managers, may act as intermediaries between users and the WSP by taking over water distribution activities from the WSP.

Establishment of pro-poor units within NAWASSCO and KIWASCO

The MWI in its NWSS and PPIP calls for water sector organizations such as WSB, WSP and WASREB as well as development partners and civil society to work together to provide the underserved LIAs with access to water and sanitation (MWI 2009). In responding to this call, NAWASSCO and KIWASCO, with the support of development partners, established pro-poor units which specifically work in the development of water services to the LIAs in their service areas (KIWASCO 2013; NAWASSCO 2013). Initially, the initiative to form these units came from the partners of the utilities as they helped co-finance their

establishment and overcome some of the initial resistance to creating these units. As an employee from NAWASSCO explains,

‘Initially there was a resistance to recruit a pro-poor programme coordinator because we thought it would be a burden for the company to pay for his/her salary while there was no expected revenues generated from doing so’ (Representative from NAWASSCO’s Finance department during a semi-structured interview).

However, both NAWASSCO and KIWASCO appreciated the importance of pro-poor units 1 year after their establishment and started paying the full salaries of the pro-poor programme coordinator. In fact, these units delivered better results than imagined. A coordinator assigned to the pro-poor unit at KIWASCO was tasked to connect 75 new people per month, successfully acquire external funds for the development of interventions and maintain a billing and collection rate of 100% (KIWASCO 2015). A commercial manager at KIWASCO revealed during an interview how pleasantly surprised he was to see that the first two indicators were met by the pro-poor coordinators with ease. In addition, they were able to maintain billing and collection ratios ranging from 90 to 95% during the first year.

Water utilities in Kenya mainly depend on grants for pro-poor investments (WASREB 2014b). In both case studies, utilities reported to have limited own resources to invest in the pro-poor interventions. At the same time, they were willing to support the operational functioning and minor repair and maintenance work required for these interventions. In order to develop services to LIAs, the two utilities mainly rely on the funds provided by the WSTF. As a result, utilities also adhere to the criteria established by the WSTF when it comes to the technological choice and/or the identification of LIAs. In addition, the utility assesses the population size in the chosen area to determine ‘potential for cost recovery and economies of scale’ (respondent from Water Service Trust Fund during a semi-structured interview). In order to release the funds to the utilities, the WSTF requires the utilities to guarantee that there will be enough water resources available to supply the low income area once the investment is realized.

Type of intervention by NAWASSCO and KIWASCO

Both NAWASSCO and KIWASCO have adopted various pro-poor interventions aimed at increasing access to water service for the urban poor in the LIAs. The interventions range from organizational adjustments, whereby both NAWASSCO and KIWASCO created pro-poor units within the WSP specifically to deal with water services in the LIAs, to the establishment of pro-poor policies on tariffs and transactions.

When it comes to technology and mode of service delivery to the LIAs, NAWASSCO has been mostly using pre-paid meters installed at various locations within the areas with low-income earners. Consumers access water at a price of KES 1.5 per jerrycan of 20 L using a token at any time of the day. Tokens are rechargeable at various vendors. The pre-paid meters operate autonomously (no attendant is required) and are considered to be cheap in terms of operations and management by NAWASSCO. The tariff of KES 1.5 per jerrycan is in line with the average tariff charged at NAWASSCO, as well as with the cost of service delivery (69 KES/m³). During the fieldwork, NAWASSCO reported its intention to transition from kiosks to pre-paid water meters as they offered more flexibility in water use (e.g., available 24/7) and saved the cost of paying the kiosk operators.

On the other hand, KIWASCO has predominantly been using a delegated management model (DMM) whereby small-scale private operators, so-called MOs, are engaged by KIWASCO to provide water services to the urban poor in the LIAs. KIWASCO provides bulk water to the MO and they sell it to their customers through a self-developed network. Rather than dealing with the customers of multiple connections, KIWASCO has guaranteed payment by the MO based on one bulk connection. The tariff structure used by the MOs is an increasing block tariff which is subsidized and is lower (the first block (0–6 m³) for a customer of an MO connection stands at KES 30/m³, while the first block (0–6 m³) for customers of KIWASCO stands at KES 33.33/m³) than the tariff charged by KIWASCO to individual connections. MOs are able to charge lower tariffs because they get bulk water from KIWASCO at a subsidized price (KES 25/m³). KIWASCO is willing to sell water to MOs at this subsidized tariff because the utility enjoys low

operational costs through this arrangement. While KIWASCO reported that many urban poor preferred individual yard taps under the delegated management arrangement with small-scale providers, KIWASCO also intends to replace the kiosks it operates for pre-paid meters.

PRO-POOR INTERVENTIONS AND IMPACT ON WATER UTILITY PERFORMANCE

In this section we examine key performance indicators that illustrate and explain the operational and financial performance as a result of the pro-poor interventions in the two case studies (WASREB 2014a). Both in KIWASCO and in NAWASSCO, pro-poor strategies are implemented through a collaboration between the technical, commercial and financial departments. This interconnection is inherent to pro-poor interventions, as they form a combination of decisions related to: technological choices, location of services, and organizational and management choices. We present the data as disaggregated elements in this section, but we acknowledge that most of these indicators influence each other.

Service coverage

Both utilities have increased their coverage levels from below 30% to 63% (KIWASCO) and 92% (NAWASSCO) in the period of 8 years from 2006/2007 to 2013/2014. Even though the above figures represent the expansion of services for the entire utility, both utilities have concentrated the expansion of services through pro-poor interventions in areas that had been historically lagging behind. NAWASSCO has implemented 191 km of water service extension to the LIAs under the pro-poor interventions mainly funded by WSTF, which enabled about 95,686 people to gain access to clean water through 166 pre-paid meters, 40 water kiosks, shared and private yard taps and private connection in various LIAs (distribution engineer from NAWASSCO during semi-structured interview). This is equivalent to 21% of the total population served by NAWASSCO. KIWASCO has made progress with about 147,373 people gaining access to clean water in LIAs through 29 MOs and 322 water kiosks and yard taps. This

represents approximately 36% of the population served by KIWASCO (pro-poor coordinator from KIWASCO during semi-structured interview). NAWASSCO provides water services to 91.5% of the 446,850 people living in their service area and KIWASCO provides water services to 63% of the 404,097 people living in their service area (WASREB 2015a, 2015b) (Table 1).

Continuity and non revenue water

As a result of limited availability of water resources, the water flowing into LIAs is limited through rationing programmes. However, KIWASCO has not reported water resources shortages as it has enough water from Lake Victoria and has recently inaugurated a new production plant with sufficient capacity to meet projected demand up to 2030 (distribution engineer from KIWASCO during semi-structured interview). As a result, KIWASCO reports it is currently supplying 24 hours in all service areas, including LIAs. NAWASSCO, with reported water resources shortages, has implemented a rationing programme supplying water 6 hours a day on average. However, consumers in LIAs accessing water through pre-paid meters currently enjoy 24-hour service, facilitated by the pre-paid meter/standpipe requiring constant flow to avoid malfunctions. The main inconvenience for consumers of the pre-paid meters is distance and waiting time.

Both NAWASSCO and KIWASCO have reduced non-revenue water (NRW) through the introduction of pro-poor interventions. Despite the fear of increased vandalism in networks located in LIAs, both utilities reported a significant reduction in water losses (both commercial and

Table 1 | Population served in the LIAs in Nakuru and Kisumu

Technology	KIWASCO	NAWASSCO
Water kiosks	111,960	21,800
Yard taps normal meters	5,285	37,441
Individual connection	23,128	27,785
Pre-paid meters	0	8,690
Total population served in LIAs	147,373	95,686
Population served in LIA of total client portfolio	36.47%	21.41%

Sources: NAWASSCO (2015) and KIWASCO (2015).

physical) even after the expansion of services to these areas. KIWASCO reduced its NRW from 75% to 42% in a period of 8 years, while NAWASSCO reduced its NRW from 68% to 32% over the same period. Even though it is difficult to make a direct connection between service expansion and NRW percentages, technical staff at both utilities attributed these reductions to pro-poor interventions. An engineer in KIWASCO asserts that

'The LIAs in Kisumu which are now under DMM initially had NRW ranging from 60–70% but since DMM was introduced NRW has decreased to less than 10%' (Distribution engineer from KIWASCO during semi-structured interview).

Furthermore, the western zone of Nakuru, where two-thirds of the residents are urban poor and where many

pre-paid meters have been installed, has the lowest NRW in comparison to the other zones of the city (Table 2).

This reduction can largely be attributed to the limited distribution network that the water utility operates. Pre-paid meters or kiosks and bulk water provision to MOs require relatively little infrastructure as the final distribution stage is either the responsibility of the consumer who collects water from the pre-paid meter or of the MO which supplies water to individuals. This reduces the operational burden of utilities and allows for lower NRW levels (Schwartz *et al.* 2017).

Collection efficiency

Both NAWASSCO and KIWASCO have improved their collection efficiency and maintained cost recovery of more than 100%, which indicates that both are financially sustainable 'despite' implementing pro-poor strategies (Figure 1). (The

Table 2 | NRW in three operational zones at NAWASSCO

Zone with LIAs	Socio-economic characteristics	Pre-paid meters (nr)	Water kiosks (nr)	Individual connections	Total population	Population served	NRW (%)
Central zone	2/3rd average income earners	12	1	6,694	59,773	54,309	48.8
Southern zone	2/3rd average income earners	43	0	4,410	24,318	24,017	47
Western zone	2/3rd LIAs	111	17	2,287	152,822	137,388	26.6

Source: NAWASSCO (2015).

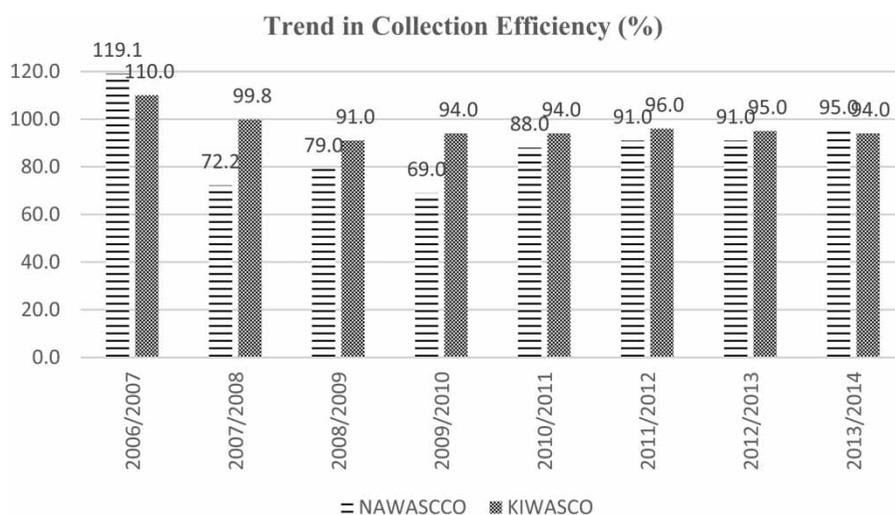


Figure 1 | Trend in collection efficiency for NAWASSCO and KIWASCO. Source: Author (data from WASREB, NAWASSCO and KIWASCO).

ratios reported in 2006/2007 exceed 100% as both utilities were collecting arrears. After that collection efficiency stabilized with minor corrections and differences).

An important factor in improving collection efficiency is that NAWASSCO and KIWASCO have increased metering of their customers. Most of the customers in LIAs access water through technologies that are at some point metered. This concerns either pre-paid meters or bulk meters when bulk water is provided to MOs. As a result, these pro-poor interventions have not undermined the commercial performance of water utilities. This is in stark contrast to literature that suggests water utilities suffer financial losses in delivering water to the LIAs (Peters & Oldfield 2005). This once again could be attributed to the technological choice, as pre-paid meters guarantee 100% payment, and through MOs the billing collection is reduced to a one-time monthly payment with one (or very few) small operators (Schwartz *et al.* 2017). Furthermore, the current development of pro-poor interventions through the use of external funds removes any burden on the utility of repayments, servicing debt or transferring these costs to the user.

PRO-POOR UNITS BREAK THE STATUS QUO

The use of MOs under the DMM and, increasingly, pre-paid meters show that water utilities consider that these models allow them to carry out their social responsibility without bearing the associated commercial and financial risk. Choosing a service delivery model which maximizes synergies between the interests of the utility as a whole and the specific objectives of the pro-poor unit, and which minimizes negative trade-offs such as the fears of expansion in LIAs affecting negatively the performance of the utility, can help water utilities to balance financial sustainability and social objectives in serving the LIAs (Schwartz *et al.* 2017).

However, it is through the implementation of pro-poor units that utilities have been able to break the status quo. It seems that through the implementation of pro-poor interventions, the challenges usually claimed by utilities to prevent their expansion works in LIAs (i.e., lack of planning or high vandalism rates) have been unravelled. Our cases show that there are indeed ways for utilities to overcome the internal and external challenges that are so widely reported in literature.

The creation of pro-poor units has not changed the realities of LIAs. The lack of spatial planning and concerns of low permanency in these areas continue to exist. However, the interventions promoted as part of pro-poor strategies have helped circumvent these challenges. The limited amount of infrastructure required to implement these solutions has helped address several of the challenges at the same time. The reported concerns and difficulties of laying pipes in unorderedly developed neighbourhoods have been done away with by the development of pre-paid meters or kiosks that reduce the amount of kilometres needed or have transferred those risks to third parties such as the MOs, who are now in charge of expanding the network in these areas. As a result, commercial and physical losses have been reduced (less than 10% reported in LIAs in Kisumu, and significantly lower than other areas in Nakuru). Other challenges related to the perceived inability and unwillingness to pay for service by dwellers of these areas has also been put into question as the technologies made available leave few options to these users. Pre-paid meters guarantee 100% collection efficiency, and payments under an MO construction are reported above 95%. Furthermore, pre-paid meters are increasingly seen as the most preferred technology option by water utilities. These achievements allow utilities to continue offering differentiated services to different areas of the city. We realize this is not ideal. However, customers in LIAs, due to lack of a better choice, are reported to prefer pre-paid meters over water kiosks as these allow for flexibility in payment and flexibility in time of accessing water.

Furthermore, the specific construction of these interventions has helped utilities find an escape to the challenging objectives of expanding services to LIAs and yet maintaining their financial and operational performance. At the same time, we need to stress that these utilities are not investing their own resources in what are still perceived as high risk areas. The interventions are mainly financed by third parties with grants or non-conditional loans. The question is whether these utilities would continue their pro-poor interventions without such external support. We would have to revisit these cases once utilities are required to invest from their own funds in these areas, or organizations such as the WSTF modify their loan conditions, to find out. However, for the moment, the cases in Nakuru and Kisumu show that a compromise between achieving social and financial mandates does seem to exist.

CONCLUSION

Using a comparative case study, this research shows how water utilities are dealing with the challenge of attaining financial sustainability, while also fulfilling their social responsibilities of serving the urban poor in the LIAs. In this paper, we have provided evidence on how expansion of services in LIAs does not necessarily negatively impact financial and operational performance of the utility. We would like to highlight that these interventions have not been prompted, nor been initially supported by management of the utilities studied. It is only because of the imposition to establish pro-poor units and the support of external agencies that these units have been formed and sustained. Yet, the creation of these units has led to successful interventions yielding positive results. These results include increased coverage, but also the opportunity to dismantle some of the prejudices previously laid on LIAs. These prejudices were preventing utilities from planning any intervention in these areas. Based on these two case studies, the establishment of pro-poor units within water utilities appears to be a promising instrument to expand services to LIAs. We realize that by promoting pro-poor units in this paper we are also promoting the paradigm of differentiated services. Differentiated services often mean that customers in LIAs get lower levels of service than other customers. In this sense, questions can be raised about the desirability of promoting and institutionalizing these pro-poor interventions. We suggest that although these pro-poor interventions allow for access to water in LIAs, they should not be seen as the end-state of water service provisioning in these areas. However, water utilities still today have to address and reconcile both financial and social mandates equally. The approach taken in Kenya of promoting the creation of pro-poor units and pro-poor technologies seems to be a compromise strategy for utilities to fulfil these mandates for the time being.

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