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Solutions for billing and revenue challenges in growing serviced rural and peri-urban settlements on trust and private land

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South African municipalities have a constitutional obligation to provide water services to all residents, including those living on customary land. Meeting this obligation in areas that fall outside the formal cadastre is a challenging exercise for municipalities that do not have de facto planning power in these areas. The recovery of costs when the service is provided is the focus of this study, which was funded by the Water Research Commission.

The conventional billing model depends on formal property ownership, which links accounts to title deeds and enables municipalities to issue bills, monitor consumption, and enforce payment. In customary areas, this model does not apply because of the lack of formalised title. The challenge of charging for services above the free basic allowance has grown as these settlements expand and as more non-indigent households settle within them.

The growing trend of affluent households building and residing on customary land has recently begun to gain attention in the literature (Mbatha and Ngcoya, 2019; du Toit and Charman, 2026). The focus on affluent households in the context of water revenue challenges is based on the assumption that these households consume higher volumes of water and can afford to pay for above-basic level water consumption.

A current study (WRC project no. C2025/2026-01902) is investigating cost recovery for water services in growing rural and peri-urban settlements located on private and customary land. As part of the study, research was conducted with officials from 3 selected municipalities (Mbombela Local Municipality, Ugu District Municipality and eThekweni Metropolitan Municipality) to understand the constraints and potential options for improving billing and revenue collection in these areas.

Billing challenges

The most immediate barrier to billing in customary areas is the absence of formalised property ownership. From the interviews with officials in Mbombela, it was found that the finance department requires a title deed to open an individual account. Without a title deed, opening an account is not possible within the existing administrative framework. Currently, there is no cost recovery for the water services

provided. This is a long-standing challenge, as it was found in the literature review that cost recovery was not taking place twenty years ago in Mbombela (Brown, 2005). The current level of supply in Mbombela includes communal standpipes and the supply is intermittent.

Ugu and eThekweni have moved beyond this impasse by adopting alternative approaches to identifying customers in customary areas. In Ugu, households register for an

account using a Permission to Occupy (PTO) certificate, which is issued by the Traditional Authority, together with the resident's identity document and the GPS coordinates of the water meter. In eThekweni, households registering for an individual connection do so using their identity document and the GPS coordinates of the dwelling, allowing accounts to be opened where cadastral data do not exist. These approaches demonstrate that billing without title deeds is practically achievable. Overcoming the title deed challenge does not, however, resolve all challenges.

A persistent difficulty for eThekweni has been getting bills to households in the first place. In the past, respondents described an arrangement in which water meter readers delivered the previous month's statement directly to households during their rounds, providing a reliable and convenient point of contact. Two different but potentially plausible reasons were offered for the abandonment of this system. One respondent described that the City took on a position of applying uniformity in how urban and rural residents were serviced (in this case, delivering accounts via the postal service). A second respondent reported that the system was discontinued after the South African Post Office objected on the grounds that delivering bills constituted a postal function. Nevertheless, both respondents highlighted that the postal service has since deteriorated substantially, leaving bill delivery a challenge.

In response to this postal challenge, eThekweni piloted a doorstep billing initiative in the Umnini Trust area, south of the city. The pilot involved a trained team conducting meter readings using a mobile device that synchronised immediately to the municipal billing system and produced invoices on site. Households without formal addresses were assigned unique identifiers. The implementing partner reported that the delivery mechanism itself functioned as intended. However, several factors undermined the broader effort. The pilot coincided with a transition in the municipal billing software, which introduced inconsistencies across accounts. There were implementation issues that included the reading of incorrect meter numbers or meter readers going to the incorrect sites, resulting in inaccurate invoices being generated. These compounding difficulties shortened the pilot from its intended three months to a single month, and no post-pilot data was collected. Because the exercise ran for such a short time, there are no concrete answers on whether the direct delivery approach improved payment behaviour.

Ugu faces a comparable challenge because of the collapse of the postal service. The municipality responded by shifting to email billing and offering households a range of alternative payment channels, including EFT (which emerged as the most popular option), payments at retail convenience stores, and an app-based payment system. Despite these improvements, Ugu's collection rates have remained low. Notably, respondents pointed out that even non-indigent households in the area are refusing to pay

for water services, attributed primarily to the intermittent supply, a challenge that cuts across all three municipalities and is examined further in the following section.

Revenue collection challenges

There are numerous collection challenges in customary areas. Some are shared with other low-income contexts, where the academic literature on non-payment is relatively well developed. These common obstacles include poverty, poor service reliability, and competing household priorities (Brown, 2005; Sutherland *et al.*, 2025). However, customary areas also present challenges that are distinct to that context, precipitated by the dual governance dynamic between municipalities and traditional authorities, and the absence of formalisation. These unique challenges, particularly around illegal connections and accountability for payment, mean that solutions developed for other low-income contexts cannot simply be transplanted into customary areas.

Municipal officials across all three interviewed municipalities reported poor service reliability in customary areas and identified this as a primary driver of poor collections. This finding is confirmed in the academic literature. Brown (2005) found that households in both urban townships and customary areas in Mbombela explicitly linked their willingness to pay to the quality of service received, stating that they would withhold payment when supply was poor and resume it when it improved. Sutherland *et al.* (2025) confirm the same pattern in eThekweni, where households expressed a willingness to pay conditional on receiving a reliable service.

A related driver concerns competing household priorities. Both Sutherland *et al.* (2025) and Brown (2005) found that households consistently prioritise payment for electricity over water. The alternatives for electricity are considered costly, whereas water can be sourced through illegal connections, rivers, or from neighbours. In customary areas where municipal supply is already intermittent, households have already begun to turn to alternatives such as rainwater harvesting and buying water from private water tankers.

The challenges above are not unique to customary areas. What is distinctive, however, is the way in which illegal connections manifest and compound existing problems in a customary context. Because municipalities do not exercise full planning control in customary areas, they respond retroactively to the rapid and uncoordinated growth of settlements. The planned capacity of existing water infrastructure is routinely exceeded as new households connect to the network informally. This gives rise to pressure loss, supply interruptions for legitimate users, and a further erosion of willingness to pay. These problems reinforce a downward spiral which undermines willingness to pay, as represented in Figure 1. Unlike in formal areas, where municipalities can enforce connection standards and

manage infrastructure expansion proactively, the dual governance dynamic in customary areas means that uncoordinated settlement development continues largely outside the municipality's ability to intervene at the planning stage.

Servicing customers in customary contexts opens up municipalities to a debt accountability challenge that is similarly distinct. In formal urban areas, the title deed links an account, outstanding debt, and credit control options to a registered property owner. Debt can be attached to a property and must be addressed when the property is transferred. In customary areas, none of these mechanisms are available. Accounts may be opened using PTOs, identity numbers, or GPS-linked meters, but occupancy can change without the municipality being notified. The result is that the person who opened an account may no longer be the person consuming the water, making it difficult to trace who is liable and to recover arrears.

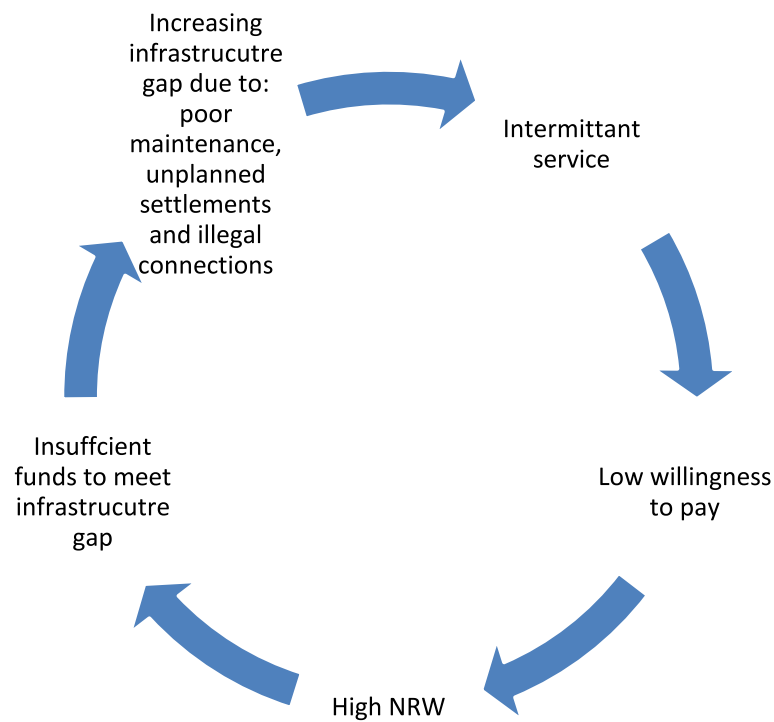


Figure 1: Cyclical challenge facing service delivery in customary areas.

Potential solutions and pathways

In this research, we are not only interested in exploring technical solutions to billing and revenue collection challenges. We also seek to provoke a wider conversation in the sector about whether changes in the institutional landscape could offer more durable solutions to this challenge. For example, Traditional Authorities (TAs) already hold significant influence over settlement planning and land allocation in customary areas. This raises a fundamental question: if TAs shape where and how settlements grow, would it make sense for them to also take on a more direct role in water services, either as a Water Services Intermediary, as an institutional account holder, or as a partner supporting collection? Such an approach would bring the functions of planning, settlement growth and service delivery closer together, rather than leaving them split across the current dual governance arrangement between municipalities and traditional authorities.

These institutional questions matter because they fundamentally reframe which technical options become viable down the line. If large-scale formalisation were introduced, for example, through titling in customary areas, post-paid options that are currently significantly disadvantaged would become more practical. With title, municipalities could create accounts, assign legal accountability, and manage credit control through their standard processes. In this scenario, conventional post-paid billing, flat-rate billing and prepaid metering could all be considered. By contrast, where titling is not possible, and household debt accountability remains difficult to establish, prepaid metering becomes more attractive because it avoids accumulated debt and reduces the need to trace occupants after they move.

The questions we then want to put forward are:

1. Should titling of land be introduced in customary areas, at scale?
2. Should TAs take on greater responsibility with respect to water services and revenue collection?
 - Should TAs take over service provision?
 - Should TAs take payment responsibility while the municipality remains the Water Services Provider? (i.e. the municipality bills the traditional authority as sole account holder and the TA recoups from households)
 - Should TAs support collection efforts?

At the time of writing, the research was at an early stage; and hence we do not seek to recommend a single option. Rather, we look to open up a debate about accountability, risk allocation, and whether the current dual governance arrangement is adequate. In Figure 2, we have laid out the potential pathways and technical solutions which become viable based on what approach is taken to the questions we have put forward, above. While some of the options would represent significant changes to the status quo of service provision and land tenure in customary areas, each carries important ramifications, advantages and implementation considerations. Table 1 sets out some of these considerations, which we intend to explore further with water sector stakeholders.

Solutions for billing and revenue challenges

Illustrating pathways for potential solutions

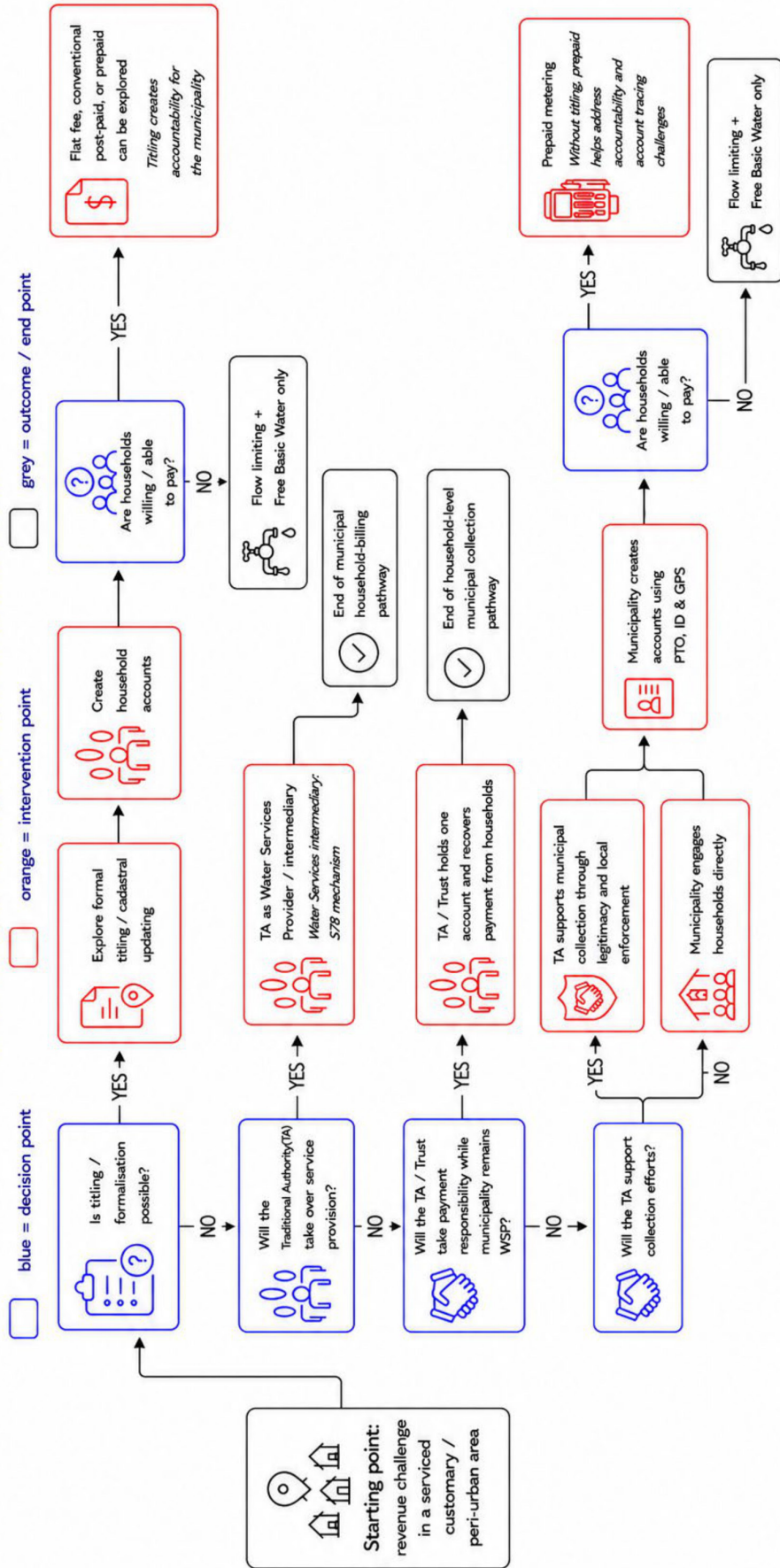


Figure 2: Potential solution pathways.

Table 1: Considerations for each potential intervention

Intervention option	Potential advantages	Potential drawbacks / risks
Titling	<ul style="list-style-type: none"> Creates clearer accountability for debt and occupancy. Allows conventional municipal account creation. Enables integration with rates, water and other municipal services. Strengthens long-term planning and infrastructure management. 	<ul style="list-style-type: none"> Changing the nature of customary land will be politically contested Slow, costly and administratively complex. Does not by itself guarantee payment if service reliability, affordability and enforcement remain weak. Creates multiple service obligations for the municipality
TA as Water Services Provider / intermediary	<ul style="list-style-type: none"> Would align local authority for planning, service delivery and revenue recovery. May improve legitimacy where the municipality has limited reach or weak local trust. 	<ul style="list-style-type: none"> Requires technical, financial and governance capacity. Risk of uneven service standards where different customary areas have low capacity and a weak revenue base. Requires transparent allocation of subsidies to cover the cost of free basic services.
TA / Trust holds one account and recovers from households	<ul style="list-style-type: none"> Simplifies municipal billing by creating a single account. TA is aware when occupancy changes. TA can then enforce clearing of debt before PTO is changed. 	<ul style="list-style-type: none"> Consequence management would be complex. Non-payment would need to be enforced at household level, in collaboration with the TA/Trust as account holder. It would be important to avoid collective penalties for the wider area when select households do not pay. Introduces risk if the TA mismanages the funds and does not pay, leaving households at risk. Requires a Water Services Intermediary Agreement Transfers all operational and financial risk to the TA.
TA supports municipal collection	<ul style="list-style-type: none"> May improve legitimacy where the municipality has limited reach or weak local trust. 	<ul style="list-style-type: none"> Support may be inconsistent, personality-driven or politicised.
Municipality creates accounts using PTO, ID & GPS	<ul style="list-style-type: none"> Allows billing to begin without waiting for formal title deeds. Builds on approaches already being used in Ugu and eThekweni. 	<ul style="list-style-type: none"> Accountability challenges when households move. Only payment enforcement mechanisms are flow restriction and prepaid metering.
Flat fee	<ul style="list-style-type: none"> Simple to administer. May be suitable where individual metering is costly and unsuitable for the volumes being consumed. 	<ul style="list-style-type: none"> Can be inequitable across household consumption levels. Weak water conservation incentive.
Conventional post-paid metering	<ul style="list-style-type: none"> Allows billing based on actual consumption. 	<ul style="list-style-type: none"> Weak in non-titled areas because occupants can move or abscond with debt. Depends on bill delivery, meter reading and credit control. Less effective where households deprioritise water payment.
Prepaid metering	<ul style="list-style-type: none"> Links payment directly to use. Avoids accumulated debt and occupant-tracing problems. Removes dependence on postal billing. Particularly useful where titling is absent and household accountability is difficult. 	<ul style="list-style-type: none"> Higher upfront costs. Risk of tampering, vandalism and bypassing. Can cause inequity if the meter is faulty or households are large (requiring more water for basic needs).

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