



TERMS OF REFERENCE FOR A DIRECTED WRC PROJECT

THEMATIC AREA

Water Use

TITLE

Optimising Water Services in Informal Settlements: Cost Analysis and Savings Potential of Decentralised Reuse

Background and Rationale

This project seeks to assess the potential water (and cost) savings that can be achieved through the implementation of decentralised water recycling and water-efficient sanitation technologies in indigent communities and informal settlements. The costs associated with supplying water to these communities are sometimes administratively classified under Free Basic Water or Non-Revenue Water by municipalities. While this is a necessary and essential service, the associated costs can become unsustainable as informal settlements continue to grow. A number of decentralised water and sanitation technologies that recycle water have been demonstrated in various contexts. Within the Water Research Commission's (WRC) SASTEP portfolio, such systems have been implemented in rural schools and the cities of Durban and Cape Town. Earlier demonstrators in rural school environments have shown that one of the main benefits of these decentralised technologies is water cost savings, particularly from reduced flushing. There is an opportunity to extend these savings to other water uses such as clothes washing. For example, eThekweni Municipality operates over 1,000 communal ablution blocks (CABs) that provide flushing toilets, showers, and clothes washing facilities to informal settlements. Introducing decentralised water recycling systems in such facilities could significantly reduce this water supply cost.

The study will quantify current water supply costs for these services in selected areas, evaluate the technical and financial viability of integrating decentralised water reuse systems, and model potential cost savings for municipalities. The objective is to provide evidence-based recommendations for reducing water supply costs and improving service delivery in under-resourced communities, while also enhancing water security and resilience through innovative and inclusive water management strategies.

Objectives

General:

To evaluate the potential for reducing water supply costs in informal and indigent settlements through the adoption of decentralised water recycling and water-efficient sanitation technologies in indigent communities and informal settlements.

To promote sustainable, inclusive, and cost-effective water and sanitation service delivery models that address the unique needs of under-served populations.

Specific Aims:

- Quantify current water consumption patterns and water supply costs in selected informal settlements and indigent communities, with a focus on water used in sanitation and communal services. Identify key water use areas (e.g. toilet flushing, showering, clothes washing) where recycling technologies can achieve the highest savings.



- Assess the technical feasibility and potential to implementing decentralised water reuse and water-efficient sanitation systems in these areas.
- Evaluate the financial viability and cost-saving potential of these technologies for municipalities, with specific attention to operating costs and reductions in water supply costs.
- Review and document lessons learned from existing pilot projects, including those under the WRC's SASTEP programme.
- Develop implementation scenarios and models for scaling up these technologies, including projected savings and return on investment.
- Provide policy and planning recommendations to guide municipalities in incorporating these solutions into their broader water and sanitation strategies.

Scope of Work

The scope of work follows the objectives with additional aspects of knowledge dissemination, including workshops and peer reviewed journals, and an edited Final Report (20% of the total project budget).

It is the responsibility of the proposers to secure access to the necessary data from municipalities, including CAB data. While the WRC can provide support in facilitating these engagements, it is preferable that proposers obtain prior confirmation or assurance of data availability from the relevant municipal stakeholders. This should be included in the proposal submission. Similarly, metering and metering data may not be able at all sites; these challenges should be worked out beforehand.

4. Deliverables

Deliverables should match the objectives of the study.

Not more than three deliverables per financial year.

The first-year deliverables may NOT include an advance.

The final deliverable of the print-ready final report, valued at 20% of the Budget is required.

Total Funds Available:

R1 million over 3 years.

Year 1: R400,000.00

Year 2: R400 000.00

Year 3: R200,000.00 (Final Report)

Key Background Sources:

<https://www.ajol.info/index.php/wsa/article/view/90116/79559>

<https://ujcontent.uj.ac.za/esploro/outputs/doctoral/Communal-ablution-facilities-as-interim-measure/9912162807691>

<https://infrastructurenews.co.za/2023/11/20/cape-town-to-pilot-new-sanitation-technologies/>