

Water Research Commission

Lynnwood Bridge Office Park, 2nd Floor, Bloukrans Building,

4 Daventry Street, Lynnwood Manor, Pretoria, 0081

Private Bag X03, Gezina, 0031, South Africa

**TERMS OF REFERENCE FOR A SOLICITED WRC PROJECT**

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| **KEY STRATEGIC AREA** | 34 (National Dam Siltation Management Programme) |
| **THRUST** | Thrust 3: Water Resources and Ecosystem Protection. Water Security, and Water Utilisation |
| **PROGRAMME** | National Dam Siltation Management Programme |
| **TITLE** | Improving the water sustainability of the UMkhomazi Catchment area: Integrated implementation of dam engineering and ecological restoration |

**Background and Rationale**

The National Dam Siltation Management (NatSilt) Programme is implemented by the Water Research Commission (WRC) and funded by the Department of Water and Sanitation (DWS). The Programme’s overarching aim is to develop a strategy that will guide, advise, and ensure effective siltation management and related improved storage capacity of the large dams in South Africa.

The programme is implemented over 3 phases:

Phase 1: Development of a draft dam Siltation Management Strategy and related tools & models

Phase 2: Piloting of the draft Strategy, tool and models

Phase 3: Review and finalise the Strategy, tools and models

The first phase has been completed, and we are currently implementing phases 2 and 3.

The NatSilt programme completed a project in 2023 to assess the state of erosion, to identify and map degraded and declining ecological features in the catchment around the proposed Smithfield Dam site. The project also identified Engineering and ecological infrastructure interventions to restore, improve and maintain the ecological features in the upper catchment. The project developed a strategic framework plan to guide, coordinate and direct interventions aimed at the rehabilitation, restoration, and maintenance of ecological infrastructure in the surrounding catchment, as well as a framework for funding and implementation. Using the outcomes of the NatSilt project Umgeni Water project, the integrated project aims to implement dam engineering and ecological infrastructure interventions.

An implementation plan has already been developed for the catchment area. This plan can be used to identify the most feasible interventions that can be implemented. Additionally, it is important to identify ways to scale up interventions and include the development of community members' enterprises. To ensure the longevity of the interventions and build sustainability, a clear roadmap is needed. This roadmap should indicate the timeline for the interventions and the party responsible for each step. It is also important to refine the monitoring of the implementation plans, including clear timeframes and approach.

***Objectives:***

1. Evaluate catchment rehabilitation plans already developed and determine which interventions to implement.
2. Conduct site assessments to identify priority areas for wetland rehabilitation and flood prevention interventions.
3. Collaborate with DWS hydrological experts to investigate de-siltation designs at weirs and assess their feasibility.
4. Analyse data from the river gauging monitoring network to understand sediment deposition patterns and flow dynamics.
5. Assess the river gauging monitoring network's impact on sediment deposition and flow dynamics and recommend critical aspects to be included in the national Maintenance Management Plan to address sedimentation effects on approach channels.
6. Facilitate stakeholder consultations to establish cooperative governance structures for long-term intervention sustainability.
7. Engage with local communities and stakeholders to foster partnerships and support for sediment management initiatives.
8. Empower youth in the catchment areas to collect water resource quality data and remove invasive alien plants following established methods.
9. Engage with stakeholders and partners to gather insights and feedback on current challenges and opportunities and provide recommendations.
10. Develop a governance framework outlining roles, responsibilities, decision-making processes, and accountability mechanisms.
11. Identify feasible beneficiation models for the alien invasive plant species and implement them.
12. Support community forums to build the necessary capacity on how to manage resources, manage siltation and maintain healthy catchments.
13. Implement wetland rehabilitation interventions to restore ecological functionality and reduce sedimentation.
14. Introduce flood prevention measures to minimize sediment runoff and erosion.
15. Investigate potential de-siltation designs at weirs to facilitate sediment re-suspension.
16. Coordinate cooperative governance structures for sustaining interventions beyond the NatSilt programme and strengthen partnerships and relationships within the catchment area to support ongoing sediment management efforts.
17. Provide suggestions on how to improve compliance monitoring and enforcement.
18. Identify gaps and opportunities for enhancing governance and financial sustainability for the catchment area partners. Design financial models and mechanisms to ensure sustainability and accountability.
19. Conduct a comprehensive review of existing governance and financial structures of blended finance mechanisms suitable for the UMkhomazi catchment area.
20. Develop a framework for improving governance and financial structures to make blended finance mechanisms fit for purpose and how establish staffing requirements and roles to support effective operation and management.

**Deliverables:**

These are the recommended deliverables but not limited:

1. Evaluation report on catchment rehabilitation plans, highlighting selected interventions for implementation. Site assessment report identifying priority areas for wetland rehabilitation and flood prevention interventions.
2. Report detailing the collaboration with DWS hydrological experts on de-siltation designs at weirs and their feasibility. Analysis on sediment deposition patterns and flow dynamics based on river gauging monitoring network data and recommendations for inclusion in the national Maintenance Management Plan to address sedimentation effects on approach channels.
3. Report outlining stakeholder and partners consultation and pragmatic framework on establishing cooperative governance structures for long-term intervention sustainability. The report should include details about stakeholder engagement activities and partnerships formed for sediment management initiatives, insights and feedback from stakeholders and partners, and recommendations.
4. Capacity building report on outcomes from community forums on resource management, siltation, and maintaining healthy catchments. this includes youth empowerment program outlining the progress report for youth involvement in water resource quality data collection and invasive alien plant removal and the implementation plan for beneficiation models for alien invasive plant species.
5. Progress report on implementation of interventions.
6. Report: Governance framework document outlining roles, responsibilities, decision-making processes, and accountability mechanisms of implementation beyond the project. this includes a coordination framework on sustaining interventions beyond the NatSilt programme and strengthening partnerships and suggestions for improving compliance monitoring and enforcement.
7. Comprehensive review report of existing governance and financial structures, suitable blended finance mechanisms for the UMkhomazi catchment area, as well as identified gaps and opportunities for enhancing governance and financial sustainability, along with designed financial models and mechanisms.
8. Final report indicating the next steps for implementation, monitoring, maintenance and financing for each of the respective stakeholders as per their responsibilities and roles.

***Please note: These terms of reference call for a multidisciplinary team consisting of team members with experience in the fields of hydrogeology, ecology, modelling, resource economics, Environmental and Civil Engineering, Community Engagement /Social Science etc***

**Timeframe: September 20024 – November 2025**

**Total Funds Available:**

R6 000 000 over 2 years

2024/2025: R4 000 000

2025/2026: R2 000 000

**Reports developed during the programme can be requested directly from the WRC to provide context:**