CICLIA TRMP SUPPORT PROJECT

CLOSE OUT REPORT

Final Version

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INTRODUCTION

The Transformative Riverine Management Programme (TRMP) aims to build climate resilience in Durban by managing the rivers in the EM (EM), to enable these waterways to function optimally in the circumstance of increased intensity and frequency of extreme rain events. The CICLIA TRMP project, funded by The Agence Française de Développement (AFD) and led by the GroundTruth team, has assisted EM by focusing on four catchments: Ohlanga, uMhlangane, Palmiet and uMhlatuzana to conduct five technical baseline assessments, create four catchment partnership development frameworks, develop eight precinct plans and finally, detail two operational prototypes.

This report provides a summary of the processes and deliverables defined in this project and highlights the Learning Lab (LL) events which took place throughout the project that were integral to the development of partnerships within the catchments (see **Figure 1**). Outcomes, in terms of the way forward for this project, are also included.

PHASE 1: INCEPTION

The inception phase of the CICLIA TRMP project involved setting up a pre-inception and inception meetings with EM and AFD, discussing and further defining the design and deliverables, and linking the project with other partners and stakeholders, including Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). A steering committee was also formed during this phase. As part of the process, the timeframes for the project were outlined and project risks discussed and highlighted. Some of the main risks that were identified upfront and the mechanisms that were put in place to assist with their mitigation are as specified in **Table 1**.

Table 1 Key risks and mitigation measures

Key Risk	Mitigation Measure
Extremely tight timelines	• Effective project management ensured, • Team made fully aware of the deadlines, • Team co-ordination to ensure balanced responsibilities and adequate capacities, • All deliverables and draft reports delivered on time; and these products were polished thereafter.
December shut down included in project timeframes	Project timelines planned to work around the shutdown.
Access to data	A letter authorising and encouraging quick data access.
Stakeholder fatigue	Combined stakeholder workshops to mitigate stakeholder overloading/overwhelm.

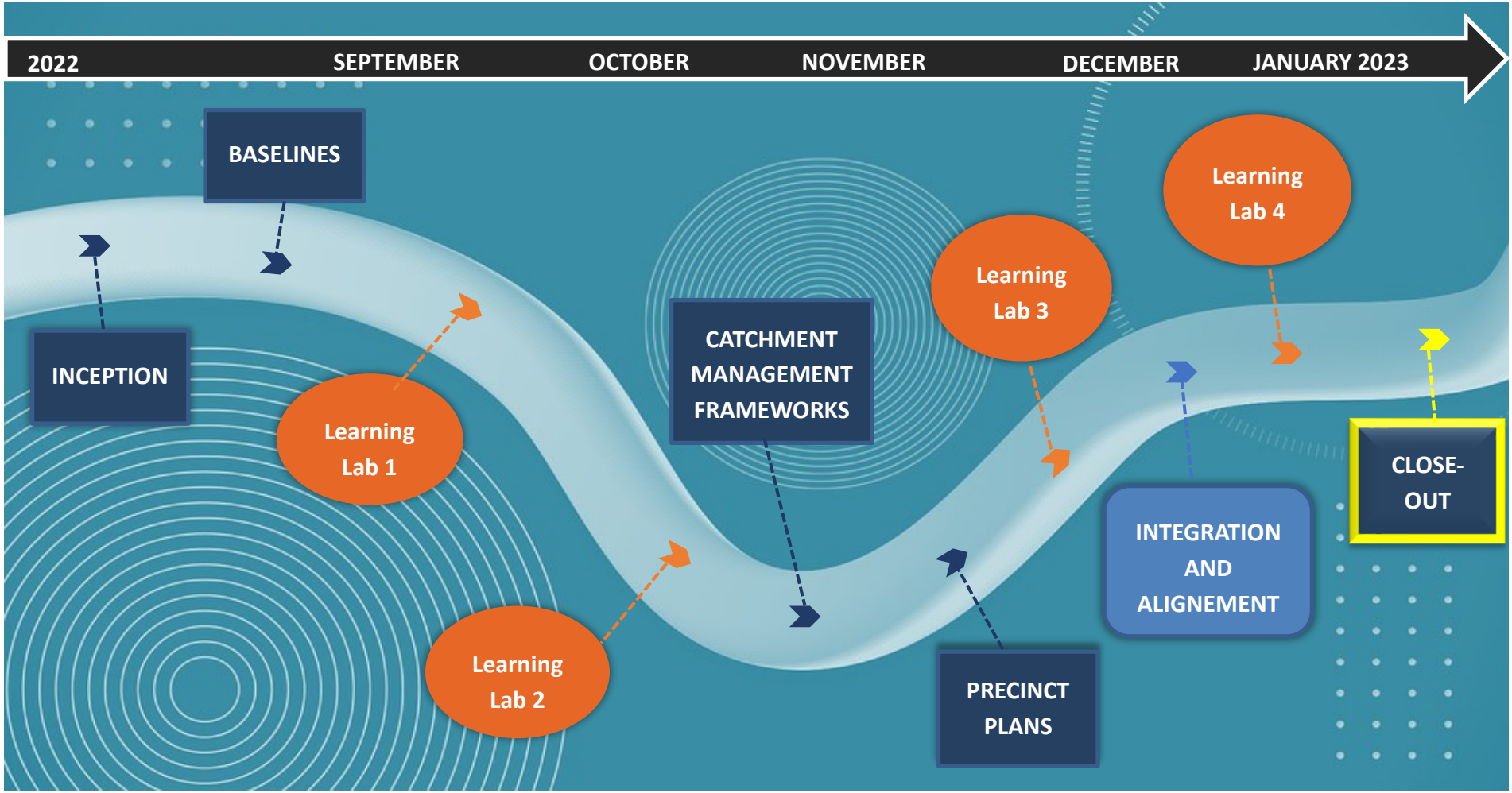


Figure 1 Process Flow of the CICLIA TRMP Project's 6 phases, from inception to close out.

PHASE 2: BASELINE REPORTS

The baseline reports provide detailed technical assessments to guide the project, and included the following:

1. River vulnerability assessment
2. The Business Case for TRMP
3. Stakeholder engagement and institutional assessment
4. Hydrology and climate change assessment
5. Catchment and open space management

River vulnerability assessment (RVA)

Aim: The RVA was created to model and assess the exposure, sensitivity, and adaptive capacity (i.e. the three components of climate change vulnerability) for three key receptors that are closely associated with and affected by river systems in the EM Municipal Area, namely:

1. **City infrastructure** based on the total number of culverts, total length of roads, total number of stormwater and sewerage manholes, and total length of stormwater and sewerage pipelines that occur within floodplains and extended riverine areas where they are at risk of being damaged during floods (refer to Section 3.3.2 of the River Vulnerability Assessment),
2. **Private infrastructure** based on the distribution and extent of settlements (formal and informal) and private commercial/industrial development areas that are also vulnerable due to flooding of rivers, and
3. **Human health, aesthetics, and recreation** based on water quality problems and pollution of rivers, which in turn affects people that use rivers, estuaries and beaches.

Key outcomes from the RVA:

a) The uMhlangane and Palmiet Rivers have the greatest exposure to flooding – the Palmiet Catchment naturally has a higher flood response due its steeper topography, river slopes and drainage network (as does the uMhlatuzana Catchment), however, the flooding response of the uMhlangane Catchment has been grossly increased through urbanization and development of stormwater infrastructure (more so than in the Palmiet). Overall, the uMhlangane Catchment is more likely to experience localized flooding, while flooding in Palmiet River has more potential to accumulate downstream, particularly downstream of Pinetown.

b) The uMhlangane and Palmiet Rivers have the highest exposure to water quality and solid waste pollution due the combination of high-risk factors causing solid waste, industrial chemicals and raw sewerage to enter into riverine systems.

c) The uMhlangane Catchment has more city infrastructure that is at risk from flooding, followed by the Palmiet Catchment. The Palmiet Catchment on the other hand has more private infrastructure that is at risk from flooding, in particular informal settlements. The Palmiet Catchment is also the most sensitive regarding water quality and solid waste pollution due to there being more people that are directly exposed to poor water quality in rivers (notably people from informal settlements), as well as having a relatively high potential to negatively impact the uMngeni Estuary and Durban's beaches.

d) The uMhlatuzana Catchment has the greatest adaptive capacity and resilience to flooding due to its floodplains and riverine habitats being more intact, while the Ohlanga Catchment has more capacity to assimilate pollution mostly as a result of available wetlands and river water dilution. Adaptive capacity is generally lowest within the uMhlangane Catchment due to high levels of transformation to river, wetland and floodplain habitats.
e) Overall, the Palmiet Catchment is the most vulnerable river system based on all three of the modelled receptors, followed by the uMhlangane, Ohlanga and uMhlatuzana.
f) At the sub-catchment level, it is possible to highlight where pressure points exist, whether from high exposure to flooding or pollution, as well as where potential opportunities exist to help mitigate the effects of flooding and pollution to help reduce the impacts of future climate change.

The Business Case for TRMP

Aim: To present an evidence-based rationale for investment in transformative riverine management within selected catchments in EM.

Objectives: To unlock increased investment from:

- the municipal fiscus in ecological infrastructure as a supplier of goods and services, and
- from other government actors, non-government, and private sector stakeholders.

Estimating the monetary value of the benefits of TRMP required that a measure was made of how people living within and downstream of the catchment, used and benefited from the catchment generated ecosystem services.
An ecosystem service assessment was undertaken to identify the services supplied by the catchment, the location and numbers of people using the river ecosystem services, and the how the service levels would change in the future, with and without TRMP (and accounting for climate change). The change in service levels was then given a monetary value. This monetary value of the benefits of catchment management, was then compared to the costs of TRMP in a benefit cost analysis, to build the business case for the municipality to engage in

Main outputs and conclusions

The results of the business case are summarized in Appendix 1 of this document[1].

What is highlighted is that investing in the restoration and maintenance of river systems & catchment shows good returns on investment for EM, as it is more cost effective than replacement and repairs.

Stakeholder engagement and institutional assessment:

Overall summary and outputs

This assessment was preliminary given the early stages of the project, drawing on reviews of existing available material, initial consultation with key informants, and the project team's experience and knowledge of the four target catchments. This included investigating the following aspects related to stakeholders and institutions at a high level:

[1] Further detail and discussion on Ecosystem Services, and the Business Case is provided in the following documents, as part of Phase 3 Deliverables: 'Appendix 3_Business Case for TRMP v4,' and ' CMF Business Case summaries'.

- Stakeholder identification
- Stakeholder power-interest assessment across four catchments
- High-level institutional assessment
- Relationships between actors
- Institutional capacities
- Assessment of the 'rules of the game'[2]
- Assumptions and Limitations

The outcomes of these assessments were intended to guide the planning and convening of cohesive stakeholder platforms, and to inform the stakeholder engagement process moving into phase 3 of the project.

This process flagged certain considerations in taking the Catchment Management Partnership Frameworks (Phase 3) and the Precinct Plans (Phase 4) forward, across all four catchments. This also shaped the approach and next steps for stakeholder engagement sessions (Learning Labs – (LLs)), with the aim to try and minimize conflict, promote inclusivity, and respect current practices (e.g., the siloed structure/approach) across the divergent group of stakeholders. In addition, the team aimed to identify complementarity and a collaborative space of convergence/transversal relationships. This included understanding and incorporating current mandates in relation to river management i.e. what is each stakeholder group's mandate/interest and how can this be harnessed to strengthen TRMP. Further to this, the team highlighted the reality of capacity constraints and the importance of developing processes and approaches that accommodate these constraints.

The following was identified from the Stakeholder baseline assessment, which also included recommendations on how to take the Learning Lab approach forward:

- There is a large overlap of stakeholders across all four catchments, which prompted the team to have combined learning labs, instead of a set of LL per catchment.
- Five categories of stakeholder groups were identified as key actors:
    - EM
    - Private Sector/Business
    - NGOs
    - Civil Society Organisations (e.g., Conservancies)
    - Research and Academic (e.g., UKZN and DUT)
    - Community based organizations and leaders
    - Provincial and National (including parastatals)
- City officials and NGO/CBOs are the key players.
- It was difficult to draw private and parastatals into the LLs, in the initial stages. However, business management associations were present at 3rd lab, and there was more involvement from private and parastatal groups in the final LL4. There has also been subsequent interest from the latter group, in the products that have come out of the TRMP CICLIA Support project, and a request from them these outcomes to be shared.
- To secure meaningful participation and minimize stakeholder fatigue, the team had to:

[2] This refers to informal and informal 'rules of the game' structure in riverine management activities that take place and how different actors interact with one another. These rules need to be considered since they directly affect the different forms of riverine management taking place within EM's catchments (see AFD TRMP Support Project: Stakeholder and Institutional Assessment, September 2022).

- Balance the scope and level of detail in the material and activities covered in the LLs, with the time available,
- Use breakaway groups to cover catchment specific aspects, and
- Generate synergies across catchments for broader TRMP upscaling.

Hydrology and Climate Change

Aim and Objectives: To understand the flow-related implications of climate change scenarios within the four catchments by assessing hydrological responses to the following key variables:

- *present* climatic conditions vs projected *future* climates under *baseline* (natural) land cover conditions
- *present* climatic conditions vs projected *future* climates under *actual* land use conditions

Main outputs and conclusions

With projected climate change, while annual rainfall and runoff is projected to decrease marginally, flood events (e.g., the 1 in 50-year floods) are likely to increase.

- Runoff outputs from natural land cover conditions are exacerbated by flows from waste water treatment works (WWTWs) as well as by outputs from hydrologically sensitive land uses, especially where erosion and formal urbanisation are present.
- Increases in sediment yield, because of their direct relationship with peak discharge and land cover characteristics, are more sensitive than increases in runoff under both present and future climatic conditions.
- Hydrologically sensitive land uses will have a greater local impact on flow volumes than the overall regional impacts of climate change per se.
- Furthermore, the hydrological responses to impacts of land use are significantly more rapid than the response to impacts of changes in climate.
- Similarly, the local impacts of land use on sediment yield responses are generally greater than impacts of climate change on sediment yields.
- However, regional impacts of climate change are superimposed upon those of local land uses, and the combined effects exacerbates flow responses.
- Future research requires more focus on event driven analyses, as the recent Durban floods showed, and should also include modelling of the hydrological impacts of alien invasive plants.

Catchment and Open Space Management

The catchment and open space management assessment identified and characterised opportunities to enable catchment and riverine management through well-planned and coordinated partnerships, which are informed by current and future catchment contexts. This study focused on the assessment of the following within the identified catchments:

- Spatial planning
- Precinct management
- Property value
- Rates base
- Various documentation and databases

Main outputs:

- The catchments are largely developed with pockets of available undeveloped and/or agricultural land holdings available to accommodate future settlement or economic development.
- The uMhlangane river corridor is the most compromised of the three catchments in terms of both formal and informal encroachment into the river corridors.
- All four catchments are largely located within the Development Phasing Line (DPL) and therefore identified for densification. The extent of densification potential varies according to an area's proximity to employment nodes and public transport.
- There is a 50:50 split of land ownership in three of the river corridors (Ohlanga, uMlhangane and uMhlatuzana) between the State (primarily EM) and the Private Sector. In the Palmiet River corridor, the State (primarily EM) owns 25% and the Private Sector 75%. Less than 2% of land in the four catchments is owned by Community Trusts (including Ingonyama Trust).
- Gross densities in the Palmiet and uMhlatuzana are relatively low (20 persons per hectare) whilst densities in the upper catchment of the uMhlangane and Ohlanga are high >60 persons per hectare.
- In total the four catchments contain approximately R140 billion of the value of EM's Property Value which generates an estimated R2.7billion in annual property rates which represents 30% of overall rates income for EM.
- Population growth will occur in each of the catchments, but the growth is not substantial (<25%) and will be concentrated in the uMhlatuzana around Mariannhill/Pinetown and the greater Hillcrest area and in the uMhlangane along the N2 corridor near Avoca and in Cornubia.

Learning Lab 1 (following Baseline Assessments)

A **learning laboratory (LL) methodology** was applied to engage stakeholders. This methodology is a transdisciplinary approach, trialled during the FRACTAL and LIRA 2030 projects[3], which acknowledges that complex problems, such as those encountered in riverine management, cannot be solved by a single line of thinking, discipline, or method. This process helped to combine multiple forms of knowledge, including expert, tacit and local knowledge, to better understand the systemic aspects of river management challenges, to support the co-design of plans and solutions. The approach recognised that there is governance-beyond-the-state in Durban's riverine management projects, where multiple state and non-state actors play various roles in managing riverine areas. The learning lab methodology created a platform to promote inclusivity, interaction, social learning and innovation, where different actors could share their knowledge with one another, and create value. The events were inclusive of a wide range of stakeholders including government (municipal and provincial), NGOs and civil society organisations, research/academic, business, and community-based organisations. In this way the LLs also facilitated a process of creating cohesion, dialogue and building trust among

[3] https://www.fractal.org.za/, https://www.c40cff.org/knowledge-library/resources-from-durban

stakeholders. Names, affiliations, and categories of the stakeholders who attended can be found in Appendix 4: Stakeholder Database[4].

The project held its first event (LL1) on 19 September 2022, to introduce the project to stakeholders from across the four target catchments. The event was used to share information about the project and background to TRMP, as well as to gather contextual information on the catchments from stakeholders. The stakeholders were then encouraged to join one of four breakaway groups (to represent each catchment), and to participate in a mapping exercise. This allowed stakeholders to highlight key elements and identify the physical location of the following in the catchment:

- key river and management catchment issues,
- key actors and their work in the catchment,
- missing actors and the best way to engage with these stakeholders,
- key risks/hazards in the catchment, and
- opportunities for strengthening the TRMP in the catchments.

Key issues highlighted by stakeholders during LL1

- Pollution and mismanagement of rivers negatively affects the livelihood of people residing in and organisations operating in these catchments.
- Changes in land use (land degradation) are a key issue.
- There is a need to find urgent solutions to the water quality issues, and failing city infrastructure, that are realistic and achievable within a short timeline.
- Climate change is particularly relevant as is flood risk.
- Large numbers of stakeholders within different sectors are present within the catchments: how do we reach and involve these people?
- Education, awareness, and accountability were highlighted as important.

PHASE 3: CATCHMENT MANAGEMENT FRAMEWORKS

Phase three outcomes were formatted specifically to guide catchment stakeholders, and thus Catchment Management Frameworks (CMFs) were transformed from a report format into four-poster formats. Detailed appendices were also included in this phase, to provide more information on certain aspects. These include the catchment partnerships assessment, toolbox of interventions and the full business case report for all four catchments.

These CMFs blend the actions and interventions recommended for the catchments with partnerships to create a framework. This framework is to assist with achieving the TRMP objectives and has been done at a catchment scale. Information from the baseline assessments was used to identify catchment risks, their drivers and outcomes that need to be managed, from which interventions are recommended and a business case developed.

Introduction to the Catchment Management Frameworks:
The introduction to the CMF is provided in three posters, which include the following related to the TRMP: an overview, background, aims and aspirations, and a definition of 'transformative' as per the

[4] All stakeholder contact details (contact numbers and emails) have been removed from the excel database, in compliance with the POPIA Act.

TRMP context. The activities of the TRMP are then outlined, and a historical timeline of the TRMP is provided. In the third poster, an overview of the TRMP CICLIA Support Project is given, along with a description of the components of the project.

Catchment Profiles and Business Case Summary:
This is structured as 4 posters outlining each of the 4 catchments and provides the following information:

- Catchment overview
- Status and conditions
- Drivers, pressures, and future challenges
- Solution and interventions

This is followed by a summary of the Business Case for TRMP.

Appendix 1: Catchment Management Partnerships (CMPs)

a. Partnership overview
b. Partnership across scales
c. Formal versus Informal Partnerships
d. Assessment of partnership commonalities, strengths, and Challenges for each catchment

Appendix 2: Toolbox of Interventions

Three tables describing practical interventions in 3 categories:

1. Biophysical
2. Social
3. Institutional/policies

Appendix 3: Business Case
Detailed methodology and results developed through the business case.

Appendix 4: Stakeholder summary
Database of stakeholders, only including their names and affiliations, to comply with POPIA regulations.

Learning Lab 2 (19 & 20 October 2022)

The 2nd LL was held over two days:

- Day one commenced with an introduction and discussion on ecosystem services associated with catchments and how changes in catchment condition impacts on the supply and demand for ecosystem services. This led into breakaway group discussions for each of the target catchments to map ecosystem assets and the users of the services and understand the trends in changes to the ecosystem services, impacts of the changes, and who is impacted.
- Day two included a session on solid waste pollution and management issues and discussion on a case study and trends and impacts in the target catchments. This was followed by breakaway sessions on potential interventions to address the prioritised challenges of solid waste, water quality and quantity challenges and flooding risks.

Key issues and outcomes highlighted during LL2

- Participatory mapping per catchment: Ecosystem services

- Shared session UKZN – solid waste management
- Discussion on partnerships
- Key interventions to address solid waste, water quality and flooding challenges.

PHASE 4: PRECINCT MANAGEMENT PLANS

Subsequent to the development of the Catchment Management Frameworks, several Precinct Management Business Plans and Operational Prototypes were developed. In the context of the CICLIA TRMP Project, a precinct represents a defined area with a specific land use context, where interventions can be developed and tested to be applied at a wider scale or in similar areas within one or multiple catchments. This is therefore different from typical planning or formal urban precincts. For the CICLIA TRMP Project two precincts were selected for each of the four catchments to develop eight Precinct Management Business Plans. Two of the eight precincts were then selected to be more fine-scaled Operational Prototypes.

Precinct management business plans (PMBPs):

The precincts for the Precinct Management Business Plans (PMBPs) were selected based on the outputs from the baseline assessments, the input from the stakeholder workshops, and discussion with key people from EM. The selection was also based on trying to incorporate different types of areas (e.g., industrial, informal settlements, formal settlements, etc.) and areas that have the opportunity for proactive and reactive interventions, this is so that the precinct plans can be trialled in different settings and upscaled accordingly. These precincts were then further workshopped during the third LL, (refer to section on LL 3 below), and subsequently a few updates were included. A summary of the selection process is as follows:

1) The baseline assessments and stakeholder engagement (particularly through LLs) were used to identify the main challenges in the catchments, where the issues occur, which areas are most vulnerable, and which areas offer good ecosystem services, as well as the different land use types and ownerships.
2) From the outputs of Step 1, multiple precincts were selected in each catchment according to the various contexts encountered.
3) These were then workshopped and narrowed down so that only two precincts were selected for each of the four catchments.

The eight precincts that were selected are as follows, (see Figure 2):

- Ohlanga: Amawoti and Umhlanga Ridge /Cornubia
- Umhlangane: Ntuzuma and Bridge City Extension
- Palmiet: Lower Palmiet / Reservoir Hills and Pinetown / New Germany
- Umhlatuzana: Hillcrest South and Tshelimnyama / Mahogany Ridge

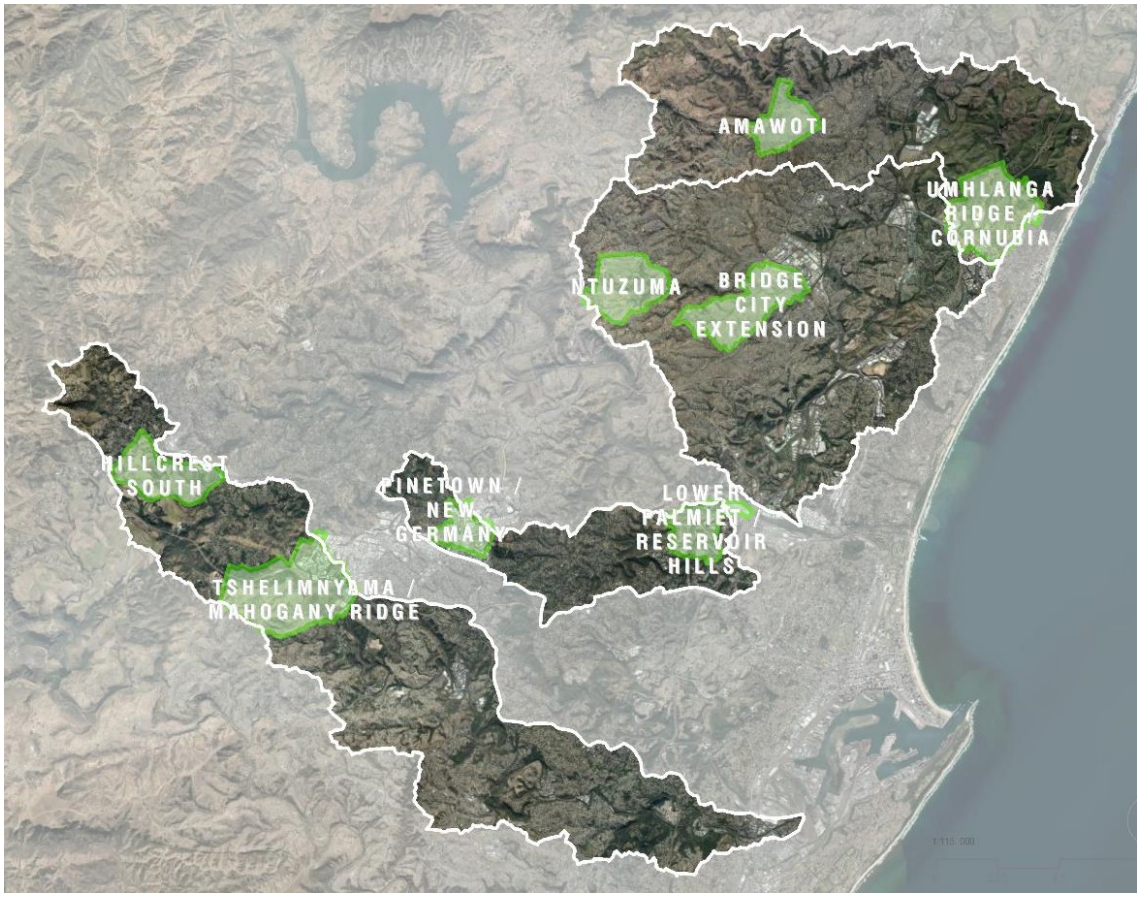


Figure 2 Eight Precincts selected within the 4 catchments

Precinct Management Business Plans (PMBPs) were then developed for the eight precincts. These PMBPs provide a roadmap to assist with guiding various groups of stakeholders working in the area, and include the following sections, (see Appendix A Close Out Report):

- Precinct map and profiles which included: Land use and ownership, future developments, open spaces, existing stakeholder capacity, and key issues.
- Proposed interventions which were comprised of biophysical, social and institutional /policies.
- Consultative forums which looked at implementation priorities, potential champions and leaders, support needed, and existing governance arrangements.
- Risks to implementation for the biophysical, social, and institutional /policies interventions.

Operational Prototypes:

The purpose of the operational prototypes was to provide more fine-scale detail for two of the PMBPs to assist with their implementation. The additional sections included for the operational prototypes consisted of partnership arrangements, funding mechanisms, and the next steps forwards. The Bridge City Extension and Tshelimnyama / Mahogany Ridge precincts were selected for the operational prototypes, predominantly based on:

- Opportunity to start implementation in the near future by considering stakeholder resources and interest/activity in the area,
- The potential impact of the interventions,
- Whether the precincts can be scaled up within the catchment to support the catchments integrity, and

- Guidance and discussions from the project steering committee.

Learning Lab 3 (16 November 2022):

Learning Lab (LL) 3 focussed on discussions on the draft catchment management partnership frameworks and the identification and prioritisation of precincts within the target catchments.

The discussions around the catchment management frameworks and the prioritisation of precincts and challenges within the precincts provided a sound foundation for discussions around d potential stakeholder partnerships in the catchments and precincts. The potential types of partnerships and partnership arrangements were discussed to explore opportunities for stakeholders to collaborate and cooperate beyond the life of the project.

Key issues and outcomes from LL3:

- Momentum development for building catchment and precinct partnerships and champions
- Sharing ideas and priorities for precincts
- Feedback and input on catchment management frameworks

PHASE 5: INTEGRATION AND ALIGNMENT

Phase 5 explored the process of integration and alignment between previous outputs, lessons and learnings/OR steps of the TRMP and this current CICLIA TRMP support project. This included an Alignment and Integration 'workshop' held with EM, AFD, and other stakeholders from the steering committee who were available, on the 7th of December 2022. The purpose of this meeting was to discuss the way forward in implementing the plans for the Precinct 'Operational Prototypes' to ensure that it is aligned with the TRMP. This interaction took the form of a discursive meeting rather than a workshop, since timelines were tight with the end of the year approaching.

A report outlining the process of 'Integration and Alignment' within this project was written, based on the outcomes of the meeting. The report included a literature review of TRMP work and other work/projects that are associated with or complement/enhance this project, and a discussion on the integration of this type of work to strengthen the approach. Different types of alignment were discussed in relation to the CICLIA TRMP Support Project, including structural and social alignment. The alignment and integration of this work with future steps within the TRMP framework going forward are discussed in this document, including the Implementation Framework (Real Consulting 2022), the operation and governance of the 'internal' and 'external' hubs, and as mentioned, plans for the 'Operational Prototypes'. The report has been submitted as a stand-alone document[5].

[5] CICLIA TRMP SUPPORT PROJECT Integration and Alignment Report Final Version 2023

PHASE 6: CLOSE OUT AND FINAL LEARNING LAB

Learning Lab 4:

As part of the close out phase, a final stakeholder engagement in the form of the fourth learning lab was held the 18th of January 2023. The event was well attended with 85 stakeholders participating on the day. The aim of the event was to:

- Recap on the project purpose, activities, and key findings
- Provide an overview of the project products and output:
    - Draft versions shared with participants on memory sticks.
    - Final versions made available via emailed link to download at the end of the project.
- Facilitate a final breakaway session for stakeholders to discuss a way forward to build partnerships at catchment level.
- Facilitate a plenary session to discuss key issues and considerations for the way forward.

Key issues and outcomes from LL4:

- The products and outputs from the project were welcomed and well received by stakeholders with recognition of the contribution these could make to ongoing and future TRMP work by stakeholders.
- There was active discussion and participation by stakeholders in planning towards building partnerships momentum beyond the project. In summary the following was agreed within each catchment:

Umhlangane: Stakeholders unanimously agreed that they wanted to build on the partnership process initiated through the project. This included 14 organisations representing a combination of Municipality, business, Civil Society, NGOs, and community representatives. The stakeholders indicated an initial preference for an informal partnership arrangement based on a hybrid model, with two partners (Bridge City Management Association and Safe Cities) volunteering to form a secretariat and lead the partners into the next phase. Partners agreed to convene a meeting to be held in the catchment on 15 March 2023 to build on the partnership and plans.

uMhlatuzana: The stakeholders from the uMhlatuzana catchment have, over the past four Learning Labs, showed increasing enthusiasm and support for a catchment-wide forum where stakeholders can:

- Plan initiatives to clear and clean rivers and maintain river integrity
- Raise funds for initiatives
- Facilitate cross-institutional learning
- Learn about, and do site visits to, successful projects
- Support newcomers into this space (e.g., Nazareth Conservancy)

A group of stakeholders (notably the Hillcrest Conservancy, Giba Gorge Conservancy, Nazareth Conservancy and a couple of municipal officials) indicated a willingness to arrange a first catchment meeting at the Giba Gorge Conservancy offices to initiate a catchment-wide platform or forum. A representative from The Hammarsdale Cato Ridge Development Association was suggested to facilitate this meeting, and to help to establish the forum and select leaders. Following the Learning

Lab, an uMhlatuzana Catchment WhatsApp group was established, and Wednesday and Friday (26th and 27th January) were suggested as potential dates to meet at the Giba Gorge conference centre.

Ohlanga: The LL created a platform allowing the participants that work in and reside in the Ohlanga catchment to connect, form partnerships, and identify crucial collaboration opportunities in and amongst themselves and their respective NGOs. One of these key collaborations that have formed is between the INK Environmental Organisation and Green Corridor. One of INK Environmental Organisation's major operations is around solid waste (cans, papers, bottles etc.) collection. The waste collected by them will be purchased from them by Green Corridor who will recycle the materials into various products such as paving blocks and slabs. UrbanMGT, as a business management association, joined in this collaboration and offered to partner with Green Corridor in purchasing these products or providing a market for the products through their business networks. UrbanMGT has further agreed to assist NGOs like the INK Environmental Organisation and Giant Heart NGO to reach the bigger and more influential businesses that operate in the catchment's industrial area to get buy-in and hopefully funding for the NGOs' operations that work to remedy the damage to the environment that is caused by the improper waste disposal. Furthermore, Amawoti ward committee members have partnered with NGOs like Giant Heart and INK Environmental Organisation to register their own environmental organisation and with the assistance and influence of other organisations like UrbanMGT and the Litterboom Project, they will be able to submit documentation and proposals for funding to get projects related to waste collection and other environmental health and safety matters. The EM, through the Cleansing and Solid Waste (CSW) and the EDU departments (through the TRMP project), have agreed to partner with Giant Heart, the ward committees and ward councillors as well as INK Environmental Organisation to get more and more environmental and education awareness campaigns running throughout the catchment. CSW has recognised that people need to be made aware and educated on environment issues. KZN EDTEA has supported this view and has also committed to ensuring that environmental education and awareness forms a big part of the work they do going forward. The engagements between the Ohlanga catchment's participants have resulted in informal network-based partnerships and collaborations.

Palmiet: Actors from the EM's Climate Change Department and the University of KwaZulu-Natal's School of Built Environment and Development Studies highlighted that, as drivers of the PCRP's Community of Innovation (COI) for several years, they would continue to progress work in this catchment through collaboration, coordination, integration and the sharing of knowledge. The PCRP has an existing governance platform, and it was agreed that stakeholders with interest in the Palmiet Catchment would be added to the current PCRP stakeholder database and that the PCRP's Action Plan would be reviewed, in light of the outputs of this support Project. The overall intention is for the PCRP to become a TRMP Project. There was discussion and reflection on existing collaborative projects within this catchment – including the Palmiet IIPSA Project (particularly the Wyebank Landfill, the ongoing work of the Enviro-Champs), the Community Based Flood Early Warning System, and the Dublin Project (using remote sensing and technology in relation to water quality monitoring); and potential future activities within the Palmiet Catchment. These include the recently submitted SEP Proposal (viewed as a "placeholder" in the PCRP), an approved CLARE proposal to upscale and advance the excellent Community Flood Early Warning System, recent developments around an Informal Settlement Upgrading Programme in the lower Palmiet Catchment, approaching Duduzane Zuma to support the Enviro-Champs; and a learning exchange between UNISA and the PCRP. There was also a

discussion on how the provincial government (EDTEA) could link into the current and future work in this catchment.

A summary of the **key issues** raised during the **LL4 closeout plenary** session included:

- Recognising the need to capacitate stakeholders that have a key role to play in TRMP catchment interventions to register on the EM Services Provider System so that they can move beyond being volunteers to being formally engaged.
- Challenges are present in understanding the EM system and how to work with it to identify the gaps and weaknesses so that other stakeholders can work to address these.
- Positive reframing of how everyone views each other,
- NGOs need to network to identify gaps and overlaps to strategically invest resources that are available,
- Move away from excusing the limited action or lack of resources and look at what can be done with the resources that are available.
- Strengthen institutional arrangements and inter-governmental relations, including strengthening communication:
- EM can also play a role in providing a bridge between stakeholders – link stakeholders to apply the capacity that they can each contribute to transform problems into opportunities.
- Recognition that networking and collaboration are key.

Close out workshop

The close-out workshop was held at the Durban Botanical Gardens on the 23rd of January 2023.

Key stakeholders identified were invited to be part of the close-out workshop. The presentations included an introduction and welcome to delegates followed by a summary of the background to the TRMP project delivered by EM. This was followed by GroundTruth team's summary of the processes and deliverables achieved during the lifespan of the project. This included key findings and outcomes, a presentation on the LL approach and reflections from stakeholders and the team, and a personal story from a community member on his connectedness with, investment in, and passion for the people within his community and their environment. AFD then responded with a reflection on the achievements of the project and outlined key areas where AFD intend to focus on going forward. Finally, EM responded to the project's summary and outcomes, providing some insights into the way forward. This session was followed by a question and discussion session, open to delegates.

THE WAY FORWARD

Outcomes/reflections from the Close out meeting:

In general, there was a very positive response to the work completed during the limited timeframes of this project, and to the positive energy around the LLs and the collaborative partnerships within the different catchments and precincts.

Key outcomes included discussion around the following:

- EM's organisation around the TRMP
    - Internal and external hub – For EM, the establishment of the internal hub resource is central to maintaining the momentum around the TRMP work, initially within the Municipality itself, but also with external stakeholders.
- Partnerships are already forming (following the fourth LL), and there are already plans to apply at precinct level.
- Plans include detail on key priorities and capacities/actors etc., which will help partners to take actions forward in a practical way.
- A Toolbox of interventions is available.
- Posters are available and have been circulated: provide an educational legacy to empower and capacitate residents and other members of civil society.

Feedback from delegates included encouragement to submit the work to peer reviewed journals, to share in the success and learnings of the process, but also to expose this work to an international audience and to potential funders. This would allow for this project's work and the powerful messages stemming from it to influence the global debate, in particular the Intergovernmental Panel on Climate Change (IPCC) and key/special reports[6] delivered by the IPCC.

Delegates from other municipalities noted that they were keen to learn from the outcomes of this project, and to have similar project methodology applied in their catchments e.g., Msunduzi municipality.

Recommendations for the way forward

Project management

The timelines were extremely tight throughout the project, and this affected each phase and corresponding set of deliverables. This not only limited what could be produced in terms of reports and documentation, but also what could be achieved in terms of stakeholder engagement and the development of partnerships. As such it is recommended that the timelines for similar projects be extended to allow time for review, consolidations, and stakeholder engagement.

Lessons Learned from stakeholder engagement:

There is general recognition across stakeholder groups that collective action is needed to address the river management challenges, and that collaboration is a priority. Some of the key issues that need to be addressed is to unlock this potential for collaboration and collective action include:

- The need to capacitate local on-the-ground champions to register on the EM Services Provider System, so that they can move beyond being volunteers to being formally engaged in the implementation of local TRMP interventions.
- The need to raise awareness among non-City stakeholder groups about how EM Municipal systems work and how to engage effectively with them. This will help to positively reframe how everyone views each other and move away blame game towards identifying what can be done to work to contribute to overcoming current weaknesses and failures.

[6] https://www.ipcc.ch/reports/

- Transition towards positive perspectives to the TRMP partnership by reappraising available resources and looking toward solutions rather than using a shortage of resources as an excuse for in-action.
- Strengthen institutional and inter-governmental relations, particularly by strengthening communication systems.
- the roles played by EM team members deeply involved in the TRMP (core team) are unclear to the catchment groups and stakeholders. It is acknowledged that these team members are not able to participate in all parts of the catchments, but there is no established means for the catchments to feed progress/questions/uncertainties with regards to the TRMP back to the 'core' TRMP team
- Despite the efforts of the technical project team to make the generated information and knowledge accessible (e.g., the poster formats and USB drives), some stakeholders have mentioned that they struggle to engage with the information and are uncertain as to how to apply it in the catchment forums going forward.

Key recommendations that have been highlighted include:

- Stakeholders recognise that the EM has a positive role to play in helping to overcome current fragmentation between stakeholder groups within the Municipality, and between the Municipality and outside groups. Identifying internal catchment champions is a critical short-term priority to bridge across to the establishment of the internal hub, which will be an effective medium- to long-term solution.
- The liaison between the internal and external hubs, and communication between different entities will need to be carefully evaluated and sustained.
- Building sustainable stakeholder partnerships is a process that requires timeframes beyond what was available for this project. The appointment and resourcing of catchment level champions (such as the uMhlangane Catchment Coordinator that was funded in the past by GIZ) is a priority that urgently needs to be addressed in to maintain the foundations to stakeholder partnerships that have been established to date.

APPENDIX A

Business Case Summary:

A summary of the business case results for each catchment is given in

Figure 3 below. As mentioned in this report, more detail on Ecosystem Services provision and the Business Case is provided in the deliverables for Phase 2 and 3 of the CICLIA TRMP Support Project.

Ohlanga implications of river management investment for key stakeholders	
Municipality	For every R1 the municipality spends on municipal owned land, it will gain R0.80 in avoided culvert damage. Note this value almost breaks even, even though other municipal infrastructure damage (sewers, water and electrical infrastructure) are excluded. In terms of private landowner management, the municipality gains R3.30 for every R1 spent on managing and facilitating private landowner management. **There is a clear business case for municipal investment that leverages private sector investment into river management in the Ohlanga**. The overall ratio is **R1.40 for every Rand invested**. **There is a clear financial business case for municipal investment in the Ohlanga.**
Private sector riparian owners	**For every R1 the private landowners spend** in river management, **they gain R0.42** in avoided services loss. This low return is largely due to high management costs and a modest numbers of river owners per km. **There is not a clear business case for river neighbours investment into Ohlanga river management.**
River and coastal users	**For every R1 spent by** society (both the municipality and private landowners) on management there is an **overall gain of R2.90**. Importantly, the coastal users benefit for no cost to themselves. **From a societal perspective, there is a clear business case for effective Ohlanga river management**. However, given the unequal sharing of costs, coastal users may need to support upstream private landowners in river management funding.

Palmiet implications of river management investment for key stakeholders	
Municipality	For every R1 the municipality spends on municipal owned land, it will gain R0.60 in avoided culvert damage. Note these values exclude any other municipal infrastructure damage, and is therefore only a partial estimate. On the other hand, the municipality gains R1.30 for every R1.00 spent on managing and facilitating private landowner management. The municipal investment leverages additional private sector investment into river management. Overall, the municipal gain could be **R0.80 per R1 spent**. It is likely that if additional infrastructure damage was accounted for (sewers, water pipes and electrical cabling), an additional R0.20 could be realised. **It is highly likely that there is a financial business case for the municipality to invest in river management in the Palmiet, if sewers, water and electrical infrastructure is considered.**
Private sector riparian owners	**For every R1 the private landowners spend** in river management, **they gain R1.04** in avoided services loss. **There is a business case for the river neighbours to invest in Palmiet management – although it just breaks even.**
River and coastal users	**For every R1 spent by society** (both the municipality and private landowners) on management the overall societal **gain of R5.40**. **There is a clear business case for society to invest in Palmiet management.** Again, the coastal users benefit for no cost to themselves. There is clear case for coastal users to financially support the private landowners in river management given that the ratio for landowners is close to breakeven. It may be prudent to lower river management costs to landowners to make their business case clearer where the benefits clearly exceed costs.

uMhlangane implications of river management investment for key stakeholders	
Municipality	For every R1 the municipality spends on municipal owned land, it will gain R0.90 in avoided culvert damage. Note this value almost breaks even, even though other municipal infrastructure damage (sewers, water and electrical infrastructure) are excluded. In terms of private landowner management, the municipality gains R3.80 for every R1 spent on managing and facilitating private landowner management. **There is a clear business case for municipal investment that leverages private sector investment into river management in the uMhlangane**. The overall ratio is **R1.60 for every Rand invested**. **There is a clear financial business case for municipal investment in the uMhlangane.**
Private sector riparian owners	**For every R1 the private landowners spend** in river management, **they gain R0.70** in avoided services loss. This lower return is largely due to high management costs and a modest numbers of river owners per km. **There is not a clear business case for river neighbours investment into river management.**
River and coastal users	**For every R1 spent by society** (both the municipality and private landowners) on management there is an **overall gain of R2.80**. Importantly, the coastal users benefit for no cost to themselves. **From a societal perspective, there is a clear business case for effective river management**. However, given the unequal sharing of costs, coastal users may need to support upstream private landowners in river management funding.

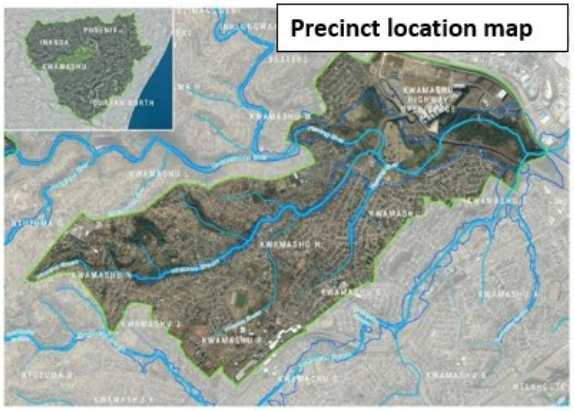
uMhlatuzana implications of river management investment for key stakeholders	
Municipality	For every R1 the municipality spends on municipal owned land, it will gain R0.60 in avoided culvert damage. Note these values exclude any other municipal infrastructure damage (sewers, water and electrical infrastructure), and is therefore only a partial and conservative estimate. However, the municipality gains R1.30 for every R1.00 spent on managing and facilitating private landowner management. The municipal investment leverages additional private sector investment into river management, making it more cost effective. Overall, the gain could be **R0.90 per R1 spent**. Given that this value only includes culverts, the total avoided damage is likely to be significantly higher. **There is a clear financial business case for the municipality to invest in river management in the uMhlatuzana catchment.**
Private sector riparian owners	**For every R1 the private landowners spend** in river management, **they only gain R0.70** in avoided services losses. This lower return is largely due to high management costs and a modest numbers of river owners per km. The cost burden is spread across a small number of landowners. **This is not an attractive business case for river neighbours in the uMhlatuzana.** However, using a -1% social discount rate, then R1.05 is gained for a R1 spent. This value may only be relevant to a limited portion of the riparian community, and alternative incentives to manage may need to be developed to promote private sector spend in management.
River and coastal users	**For every R1 spent by society** (both the municipality and private landowners) on management the **overall gain is R1.75**. **There is a clear business case for society to invest in uMhlatuzana management.** However, the coastal and port users benefit from river management but with no cost to themselves. For these users to access sustained service levels from the upstream river, it may be prudent for the coastal and port users to pay upstream landowners (who don't have a business case themselves) to improve river management.

Figure 3 The Business Case Results for all catchments, reflecting the implications for management of the catchment by key stakeholders: Municipality (i.e. EM), Private sector owners, and river and coastal users.

Precinct Management Business Plans (PMBPs):

1. PRECINCT PROFILE

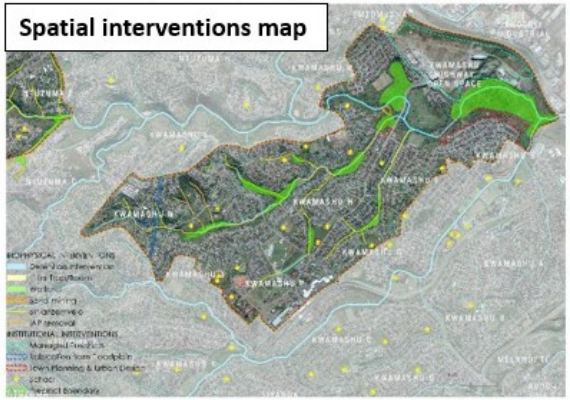
Precinct location map



Precinct characteristics
Current land ownership → *Map in appendix*
Current land use → *Map in appendix*
Open space → *Map in appendix*
Projected developments
Hydrology, sedimentation, and climate change
Stakeholder capacity
Key issues / Vulnerabilities

2. PROPOSED INTERVENTIONS

Spatial interventions map



Intervention No.	Name	Description	Estimated Costs
Biophysical **B01** **…**	Name of intervention	Description of intervention	Where possible estimated costs have been provided
Institutional **I01** **…**			
Social **S01** **…**			

Figure 4 Precinct Management Business plans (PMBP) structuring, including: 1) Profile, 2) proposed interventions,

3. CONSULTATIVE FORUMS

- Implementation priorities
- Potential champions
- Support needed
- Existing governance arrangements

4. RISKS OF IMPLEMENTATION

Risk to implementation	Severity		
	Low	Medium	High
Institutional risks			
Social risks			
Biophysical risks			

5. APPENDICES MAPS

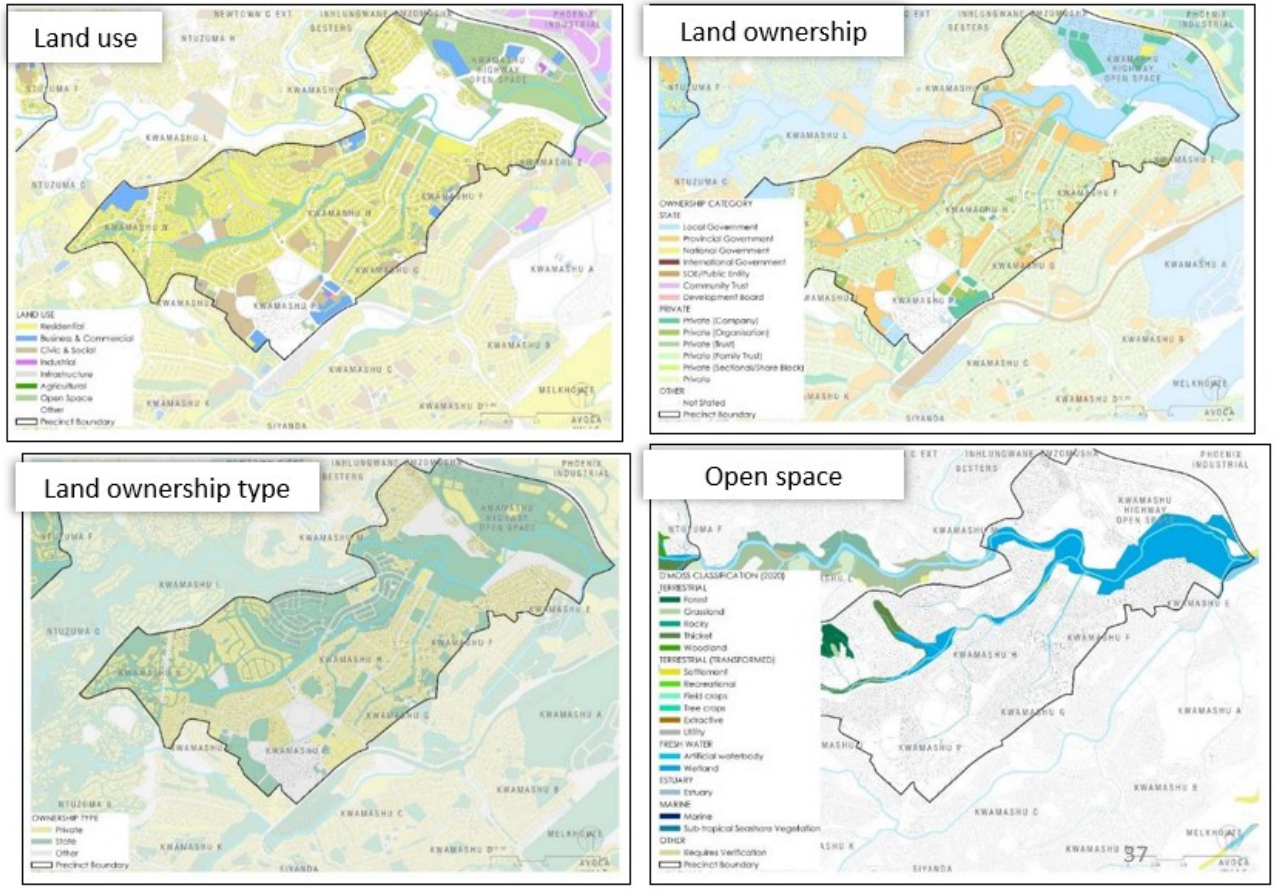


Figure 5 Precinct Management Business plans (PMBP) structuring, showing: 3) Consultative forums, 4) Risks of implementation and 5) Appendices Maps