

Concept Note

Enhancing adaptive capacity through rainwater harvesting for communities vulnerable to climate change in iLembe District municipality, KwaZulu-Natal (South Africa)

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Introduction

The iLembe District Municipality (3 260 km² or 3% of the KwaZulu-Natal provinces' geographical surface area) has four local municipalities: i.e. Mandeni, KwaDukuza, Maphumulo and Ndwedwe. With a population of about 657 612 people, many areas are difficult to access to provide efficient services like potable water and electricity because of the hilly topography. The aging water infrastructure is poorly maintained, and problems of theft and vandalism add further strain on the district municipality to provide water, as per their mandate. Many communities still rely on rivers, Jojo tanks (UV resistant polyethylene storage tanks) and dams for drinking water and for agricultural purposes. This also has led to poor sanitation in the region, and vector-borne diseases are common in some areas. The activity of collecting water still remains the primary function of women and children which contributes to the low literacy level and poverty in the region.

KwaZulu-Natal was declared a drought disaster area in 2014, and the drought conditions are still persisting in the iLembe District Municipality⁴. According to climate projections from the Council for Scientific and Industrial Research (CSIR), average temperatures are expected to increase country-wide in the near future, thus placing an extra burden on water resources because of accelerated evaporation rates. In other words, there will be less fresh water in the future, which will deepen food insecurity and sanitation challenges. Considering these challenges and future risks of climate to water security, actively engaging in water conservation technologies like rain water harvesting will enhance the adaptive capacity of KwaZulu-Natal.

Relationship to the country's sustainable development priorities

South Africa has communicated its vulnerability to water and food security in its Nationally Determined Contribution to the UNFCCC. Between 2010 and 2015, the country has invested from US\$ 0.17 bn to US\$ 0.59 bn in the Water sector⁵. However, the demand for water is on the rise as a result of socio-economic growth and development⁶. The need is a dire need to increase investment in low cost (i.e. affordable) technologies such as Rain Water Harvesting as an adaptation measure to improve the climate resilience of communities. This is an established

⁴ iLembe District Municipality's Integrated Development Plan 2017 – 2022

⁵ South Africa's Intended Nationally Determined Contribution (INDC)

⁶ A National Climate Change Response Strategy for South Africa (2011)

technology with many users in the iLembe district/region according to studies by the Water Research Commission (WRC). The WRC is developing guidelines to ensure portability of harvested and stored rainwater. In addition, as a part of their renewable energy programmes in the region, the South African National Energy Development Institute has also implemented projects in to harvesting rainwater through installation of Jojo tanks especially in schools. However, increasing the scale of implementation and finding investments from the private sector in order to reach communities beyond municipal water supply remain pressing concerns for a wider technology adoption. Deployment of this technology will enable the iLembe District municipality to achieve:

- Reduction of the costs of hiring water tanks in the region, especially during prolonged drought periods;
- A back up water supply alternative to new low cost development houses, especially in difficult to access areas
- Address health, food insecurity and sanitation challenges;
- Capacity development (i.e. knowledge sharing with communities) and job creation (e.g. installation and maintenance of the infrastructure).

Barriers to dissemination and measures

The importance of rainwater harvesting in alleviating the water stress is uncontested in KwaZulu-Natal. However, the key barriers to the technology dissemination, as also mentioned in the development of technology road maps are as follows.

- 1) Initial capital investment
- 2) Poor knowledge level about equipment and maintenance
- 3) Fragmented communities

To deal with these barriers, the municipality of iLembe will take an active role in project demonstration. For the barrier of initial capital investment, the municipality will provide initial technical and equipment support. Technical support will be in identifying the communities for implementation, identifying equipment required and developing the terms of reference with private suppliers. According to the needs of the users, appropriate financing options will be provided to the end users in engagement with the private equipment suppliers. In the project concept here, a 50:50 sharing mechanism is proposed. The private suppliers will provide ongoing maintenance and operations support. The users will be trained for regular maintenance and operations. A targeted communication strategy will be implemented to promote the technology and convey the success of this demonstration project.

Preliminary Technology Targets and Ambition of Concept

Implementing rainwater harvesting has national priority, to manage the climate-induced uncertainties in agriculture, farming, domestic and industrial consumption. The implementation of this demonstration project should be aligned with the objectives of the Integrated Development Plan (2017-22) of the iLembe municipality. In this demonstration project, the ambition is to work on a successful project implementation within the iLembe municipality for implementation replication of this project throughout the province of KwaZulu-Natal with the assistance of key stakeholders such as KZN's Economic Development, Tourism and Environmental Affairs Department, as well as Trade and Investment KZN. A roof top rainwater harvesting for 50 public schools (5000 L), 20 public offices (5000 L) and 25000 rural households (1000 L) will be implemented. These capacities are based on estimated local requirements per rural household/public office/schools.

Project Concept

The activities in this action plan can be divided under action categories

Action 1: Installation of the equipment.

This includes all the activities that from development of terms of reference for implementation to actual implementation and of equipment and their subsequent operations and maintenance. The activities under this action are as follows

- Development of terms of reference for external contractual parties in the project – In this action a team from the municipality will develop comprehensive terms of reference for engagement with external suppliers and procurement of equipment. Tenders will be floated as part of this activity.
- Identification of sites: The team the iLembe municipality will identify potential sites for installation. This activity will involve end users i.e. relevant public service employees of the 20 public offices, officials from the identified 50 public schools and households. The local bodies will have to be engaged to ensure that the selected households are on board the project. The municipal officials will have to agree on the cost sharing mechanism at this stage. With the involvement of the municipal officials, the end users will get better bargaining power, the monetary benefits of which will be accrued to them. This activity will also entail a mapping exercise to support the implementation.
- Assessment of technology requirement: The municipality team in consultation with the end users and final suppliers will identify the exact specifications for each installation including the plinth construction. This will include assessment of accessories required like piping length, gutter mesh, pre-filtration parts, first flush diverter etc.
- Procurement of equipment: The equipment provider will be identified from tender.
- Installation of equipment: The equipment provider will install all the equipment. The team from iLembe municipality along with local bodies and end users will be responsible for monitoring for the progress and reporting any issues to municipality or the supplier as the case may be.
- Operations and maintenance: The end users are primarily involved in the operations and maintenance of the equipment. The equipment supplier will provide an annual maintenance option to end users.

Action 2: Training users

- Training programme for users: The municipal body, local bodies, local technical training institute and water research commission will design a short and effective training module for the end users to operate the equipment easily, fix simple maintenance issues, clean the equipment when required and be able to report the complicated issues conveniently.
- Provision of annual equipment maintenance: The equipment supplier will have a provision of annual maintenance. This implies that the supplier will ensure regular checks of the equipment. This option is particularly relevant for institutional users like the schools and public institutions that have bigger tanks, more users and limited staff to dedicate for maintenance.
- Helpline for user queries. This activity will be done by the equipment suppliers so that the end users can report any maintenance issues or ask general queries on operations.

Action 3: Communication and outreach

The detailed activities of the communication and outreach programme will depend upon the scale of activities. Three broad activities that will need be pursued it determine the scope of work through terms of reference and floating a tender for relevant agencies to implement a communication plan. The shortlisted agency will then collaboratively work on a communication and outreach programme and implement it. The purpose of this action is to promote the use of rainwater harvesting systems in entire province. Success stories from iLembe can also be used for future expansion into other provinces. The activities of this action are:

- Terms of reference for outreach programme
- Identification of agencies to implement outreach
- Outreach implementation

Action 4: Promotion of local enterprises

The larger goal of this project concept is also to promote local manufacturing. This would mean that the following activities that support local technical capacity building, promote local

manufacturing options, help suppliers of different accessories etc. will be encouraged. The equipment life span is expected to be 10 years with regular maintenance. The activities for actions 1, 2 and 3 are planned for 21 months. Activities in this action are ongoing and long term in nature. We expect the background inputs for policy changes from the municipal bodies to be provided to the provincial government and revenue services with this period. The actual policies changes for promotion of location enterprises are likely to take 1-2 years post the success of this demonstration project.

Following is a list of activities to be considered as a part of this action. This action will also need engagement of Provincial Government; iLembe municipality and South African Revenue Service.

- Identification of potential manufacturers
- Development of training modules relevant for manufacturers and workers disseminated through local technical university or industrial training institutes
- Training of manufacturers
- Build a suppliers network
- Access to subsidized financing options from banks
- Access to subsidised excise duty for eco-friendly production

Outputs

Action 1: Fully functional Rainwater Harvesting Systems installed at the

Action 2: Training module for the users ready and implemented for the demonstration phase.

Action 3: Communication and outreach programme implemented.

Action 4: A conducive policy environment for local manufacturing created.

Key Risks and Mitigation measures

A key advantage with rain water harvesting is that it is a well-established technology. Therefore, the risks of not having a procured the right equipment is relatively low. The key risk for the technology are in making sure that the technology is utilized to its potential with minimal downtime. Lack of proper O&M can reduce the technology effectiveness and life span. This

means that the end users and designated persons for the schools and public bodies are trained in an effective manner to ensure that the post-installation operations and regular maintenance is carried out with ease. To mitigate this risk, the municipal body has to ensure that users get relevant training for operating and maintaining the equipment in the long run. Inadequate or ineffective training can pose substantial risk to the operation of the equipment. In addition, the municipality has to ensure that procurement guidelines to include a provision of periodical equipment maintenance service from the suppliers. This also provides an alternative to users to have technical support in case they cannot manage the maintenance. The municipal body will also have to make provision for feedback from end users so that the users can provide feedback on the technology, on training and its relevance in maintaining the equipment and on the service level of the equipment provider. Municipality will nevertheless also have to keep in mind the minor risks listed in project concept table.

Barriers and opportunities

The barriers to the dissemination of technology are listed in technology road maps. In this specific project concept requires active engagement of from the end users, not just being part owners of the equipment but also in subsequent maintenance. It will require users to participate in training programmes. The key thing here will be to ensure that local bodies find households that are willing to invest in the technology. Going through the municipality's procurement route will give more bargaining power to the end users, especially the households. The project concept makes provision for engaging end users through financial subsidies and training. This project should be seen as a demonstration project. This is primarily because the project is of a sizeable scale and the municipality will have to seek financial external support for the huge investment needed to implement it.

The immediate incentive for the municipality is that it will save on the water supply expenditures that body makes especially during the drought period. The project is also an opportunity for the municipality to promote not just health, sanitation and well being, but also to encourage household farming wherever possible. In the longer term, the project will support more capacity development and local enterprises for manufacturing accessories and equipment. The project

concept is designed for the technology lifetime, i.e. 10 years. Within this time-period, ground water recharge will increase the water table.

Budget

The iLembe District Municipality has a mandate to provide water to communities in the iLembe region. In this concept note, however we have used a 50:50 cost sharing mechanism between the municipal bodies and end users. This is to encourage ownership and engagement from the end users. The details of cost assessment for every activity is presented (in local currency) in the concept table along with the working notes for each cost assessment. In the table below, we provide an action wise overview of the concept in the local currency and also in US dollars (1 USD = 12.5 ZAR). These costs are only presented from the municipality's perspective, therefore do not include the incidental costs that other stakeholders such as the end users incur.

Action	Total Budget ZAR	Total Budget USD @ 12.5
Action 1: Installation of the equipment.	20,445 + 29,710 + 20,445 + 42,741,500 + 34,800 + 0 = 42,846,900	3,427,752
Action 2: Training users	34,800 + 15,000 = 49,800	3,984
Action 3: Communication and outreach	20,455 + 30,000 + 220,000 = 270,455	21,636
Action 4: Promotion of local enterprises	30,000 + 90,000 + 30,000 + 60,000 = 210,000	16,800
Total	43,377,155	3,470,172

Beneficiaries and Impacts

The project is estimated to target 157,000 beneficiaries (6 per household, 120 per school and 50 per public office). These are immediate beneficiaries. The immediate savings for the municipality will be in terms of provision of water supply through tankers. The project will have long term impact on the following

Community Level Benefits:

- Improved sanitation and health.

- Food security from household or communal gardens through irrigation using harvested water.

Benefits for the municipal corporation

- Reduction in water discharge to communities by the authorities. Water discharge can be planned more efficiently.
- The risk of emergency drought response that often requires hiring of water tankers can be significantly reduced.
- Water stress relieve on municipal reservoirs.

Environmental Benefits

- Reduction of soil erosion.
- Stabilisation of water tables.

Economic Benefits

- Potential for local manufacturing and distribution
- Job creation in the region.

Sector	Water						
Sub- sector	Rainwater harvesting						
Technology	Roof top rainwater harvesting						
Ambition	Roof top rainwater harvesting for 50 public schools (5000 L), 20 public offices (5000 L) and 25000 rural households (1000 L)						
Benefits	1) Water availability for consumption 2) promotion of health and sanitation 3) savings for municipality to provide water						
Action	Activities	Responsible body	Time frame⁷	Risks & Mitigation	Success Criteria	M&I Indicators	Budget R
Installation	Development of terms of reference for external contractual parties in the project	Department of Water Affairs and Sanitation, iLembe municipality; Water Research Commission; Finance department, iLembe District Municipality	2	Comprehensiveness of the TORs Consult experts to ensure all-encompassing TORs	At least 3 applicants to the bid	Terms of reference for external contractual parties in the project developed and advertised.	20445 WN 1
	Identification of sites	Department of Water Affairs and Sanitation, iLembe municipality, Water Research Commission; Finance department, iLembe District Municipality; The South African Local Government	2	Some important sites are not included in the shortlist. This is not a major risk considering that the implementation is in a smaller pool. Local consultations will ensure suitable sites are chosen	--	Installation sites identified	29710 WN 2

⁷ months

		Association (SALGA)					
	Assessment of technology requirement	Department of Water Affairs and Sanitation, iLembe municipality; Water Research Commission; Finance department, iLembe District Municipality; SALGA	2	Wrong equipment is chosen. As rainwater harvesting is an established technology, the risk of identifying wrong equipment is low. Consulting technical experts and private sector providers will mitigate the risk	Technology meets the requirements of end of users	Type and quantity of equipment and accessories required is identified	20445 WN 3
	Procurement of equipment	Department of Water Affairs and Sanitation, iLembe municipality; Private equipment suppliers; Finance department, iLembe District Municipality	3	Equipment is expensive. This is a low risk activity. Following standard procurement procedures will ensure the right equipment is procured. An effective cost sharing mechanism with the end users will also lower capital expenditure for the municipality and create a sense of ownership among the users	--	All equipment and accessories required for installation are procured	42,741,500 WN 4
	Installation of equipment	Private equipment suppliers	6	Additional structural changes required for installation.	At least 20% of annual water requirement	Equipment is installed and ready to use at all the identified sites.	34,800 WN 5

				In general, piping infrastructure has to be installed. Some structural changes to harness water from rooftops may be needed. This risk is a low risk activity; however, inputs from private suppliers while identifying sites will bring to light an overall picture of specific installation requirements.	per user met by RWH		
	Operations and maintenance	End users	Og ⁸	Lack of proper O&M can reduce the technology effectiveness and life span. Ensure that users get relevant training for operating and maintaining the equipment in the long run	At least 3/4 th of the users who can handle regular maintenance issues after the training At least 90% of users can operate the equipment after training	--	0 WN 6
ACTION 1 TOTAL				ZAR 42,846,900 / USD 3,427,752			
Training	Training programme for users	Department of Water Affairs and Sanitation,	2	Inadequate or ineffective training.	At least 3/4 th of the users who can handle	Training module for end users is	34,800 WN 7

⁸ Ongoing

		iLembe municipality; Private equipment suppliers; Water Research Commission; Finance department, iLembe District Municipality; SALGA		This can pose substantial risk to the operation of the equipment. The training programme must be closely monitored by the iLembe municipality to ensure users are provided with adequate and effective training.	regular maintenance issues after the training At least 90% of users can operate the equipment after training	designed and implemented.	
	Provision of annual equipment maintenance		<i>Og</i>	Suppliers do not provide equipment maintenance service. Procurement guidelines to include a provision of periodical equipment maintenance service from the suppliers.	End users availing this service are satisfied with the annual maintenance service	Option of annual equipment maintenance is provided to end users.	15,000 WN 8
	Helpline for user queries		<i>Og</i>	Suppliers do not provide a helpline for service queries. Procurement guidelines to include a provision of helpline from the suppliers.	End users availing this service are satisfied with services provided through the helpline	A functional helpline is established for end users	
ACTION 2 TOTAL				ZAR 49,800 / USD 3,984			
Communication & Outreach	Terms of reference for outreach programme	Department of Water Affairs and Sanitation, iLembe municipality; Local technical	2	Comprehensiveness of the TORs Consult experts to ensure all-encompassing TORs	At least 3 applicants to the bid.	Terms of reference for designing and implementing outreach programme	20455 WN 9

		university; Finance department, iLembe District Municipality; SALGA				developed and advertised.	
	Identification of agencies to implement outreach	Department of Water Affairs and Sanitation, iLembe municipality; Finance department, iLembe District Municipality; SALGA	2	Incompetent outreach agency. Following standard service procurement procedures will ensure the right agencies are identified to design and implement the outreach programme.	--	Implementing agency meeting the selection criteria identified	30,000 WN 10
	Outreach implementation	Department of Water Affairs and Sanitation, iLembe municipality; Private equipment suppliers; NGOs; Local stakeholders; Local technical university; Water Research Commission; Finance department, iLembe District	Og	Agencies do not implement the outreach activities effectively This can pose substantial risk to technology deployment in future. Outreach implementation must be closely monitored by the iLembe municipality to ensure wide range of users are covered with an effective programme	Outreach programme reaches at least 300,000 people	Outreach programme successfully implemented	220,000 WN 11

		Municipality; SALGA					
ACTION 3 TOTAL				ZAR 270,455 / USD 21,636			
Promotion of local enterprises	Identification of potential manufacturers	iLembe municipality; NGOs; SALGA	3	<p>Uninterested manufacturers identified.</p> <p>An effective training programme will ensure that manufacturers are convinced about the financial viability of the technology. This will enhance their willingness to invest in local manufacturing facilities and include grass root design innovations suited for the locality in their products. Local consultations will ensure grass root innovators are also included in training modules.</p>	At least 50 manufacturers identified	List of potential manufacturers identified.	30,000 WN 12
	Development of training modules relevant for manufacturers and workers disseminated through local technical	iLembe municipality; NGOs; Local industrial associations; Industrial training institute; Local	3	<p>Ineffective training module.</p> <p>The training module for workers involved either in the manufacturing or in repair and installation procedures is a</p>	--	Training modules for manufacturers and workers developed	90,000 WN 13

	university or industrial training institutes	technical university; SALGA		standard low risk module and can be implemented by local industrial training institutes effectively. Training module for manufacturers will require a good balance between technical and economic aspects of manufacturing. Involving local technical university and local industrial associations can help design a comprehensive module.			
	Training of manufacturers	iLembe municipality; Local industrial associations/ cooperation; Local industrial training institute	<i>Og</i>	Less attendees. Active involvement from the iLembe municipality can ensure interested manufacturers and workers receive the training. The outreach programme for users will also indirectly promote local workers to enrol.	At least 2/3 rd of the manufacturers identified in the list undergo training	Training modules are implemented as per time schedule	30,000 WN 14
	Build a suppliers network	iLembe municipality; Local industrial associations/ cooperation	<i>Og</i>	Policy for subsidies on excise duty is created and implemented.	At least 90% of the existing suppliers join the network	A network of suppliers is created.	60,000 WN 15

	Access to subsidized financing options from banks	iLembe municipality; Local industrial associations/ cooperation; Banks	<i>Og</i>	Funding not secured. The municipality will have to make provisions manufacturers to have access to subsidised loans for manufacturing either the entire equipment or spare parts. Prior applications for external funding or making a budget allocation for these subsidies will ensure easy finance access to manufacturers.	At least 50% of the local manufacturers entering venturing into the manufacture of RWH equipment and its accessories avail this policy	Policy for subsidized financing options is created and implemented.	WN 16
	Access to subsidised excise duty for eco-friendly production	Provincial Government; iLembe municipality; South African Revenue Service	<i>Og</i>	Funding not secured. The municipality will have to make provisions manufacturers to have access to excise duty rebates for having eco-friendly production. Prior applications for external funding or making a budget allocation for these subsidies while negotiating with the revenue services will make the equipment affordable, thereby reducing the long-term	At least 50% of the local manufacturers entering venturing into the manufacture of RWH equipment and its accessories avail this policy	Policy for subsidies on excise duty is created and implemented.	WN 17

				capital cost burden on both the municipality and the users.			
ACTION 3 TOTAL				ZAR 210,000 / USD 16,800			
TOTAL BUDGET				ZAR 43,377,155 / USD 3,470,172			

Working notes on cost and savings assumptions:

#	Cost Calculation	Assumptions	References
1	<p>Number of persons: 5 Work Days: 3 Number of Staff days=5*3 = 15</p> <p>HR Expense=(15/22)*30,000</p> <p>Total Activity budget ≈ 20445</p>	<p>Minimum wage rate is 2933 per month for workers (rounded to 3000). It is assumed that the average minimum wage for experience iLembe municipality staff is 10 times this rate i.e. 30,000 p.m.</p> <p>Number of working days in a month 22. Working hours per day 8.</p>	<p>Minimum wage rates for SA: https://mywage.co.za/main/salary/minimum-wages</p>
2	<p>Number of persons: 4 * 2 Travel Days: 2*1 for site visit Additional Staff Days = 2*4 = 8 HR Expenses: = (8/22) * 30,000 = 10910</p> <p>Total Trip Expenditure = 7900*2 = 15,800</p> <p>Mapping Expenditure: 3,000 approx.</p> <p>Total Activity Budget = 10910 + 15,800 + 3000 ≈ 29,710</p>	<p>Site visits: 2 Total distance: 154 kms per trip (based on area of the district) Fuel efficiency: 11 km/l Gasoline: 14 lit @ 50 = 700 per trip Personnel = 3000 per trip</p> <p>DA: 397+128 =525 + Mark up 100% = 1050 per trip</p> <p>Trip Expenditure= Fuel + Personnel + DA = 700 + 3000 + 4*1050 = 7,900</p>	<p>Area of iLembe: 3269 sq. km.</p> <p>Cost of living numbers https://www.numbeo.com/cost-of-living/country_result.jsp?country=South+Africa</p> <p>Daily Allowance http://www.sars.gov.za/Tax-Rates/Employers/Pages/Subsistence-Allowances-and-Advances.aspx</p>
3	<p>Number of persons: 5 Work Days: 3 Number of Staff days=5*3 = 15</p> <p>HR Expense=(15/22)*30,000</p> <p>Total Activity budget ≈ 20445</p>	<p>Includes tender floating time</p>	
4	<p>Total capital expenditure</p> <p>Tanks: 70*4500+ 25000*2000 = 157,500 + 25,000,000 =50,315,000</p> <p>Incidental equipment cost for municipal bodies = 50% * 50,315,000 = 25,157,500</p>	<p>Total Tanks requirement: 5000 L: 70 units (50 for schools + 20 for public institutions) @ 4500 each 1000 L: 25000 rural households @ 2000 each</p> <p>Accessories requirement (piping, gutter mesh, pre-filtration parts, first flush diverter etc.): 1000 per unit / 700 per unit</p>	<p>Tank Prices https://www.makro.co.za/sports-and-outdoor/water-storage-SHG/pg1</p>

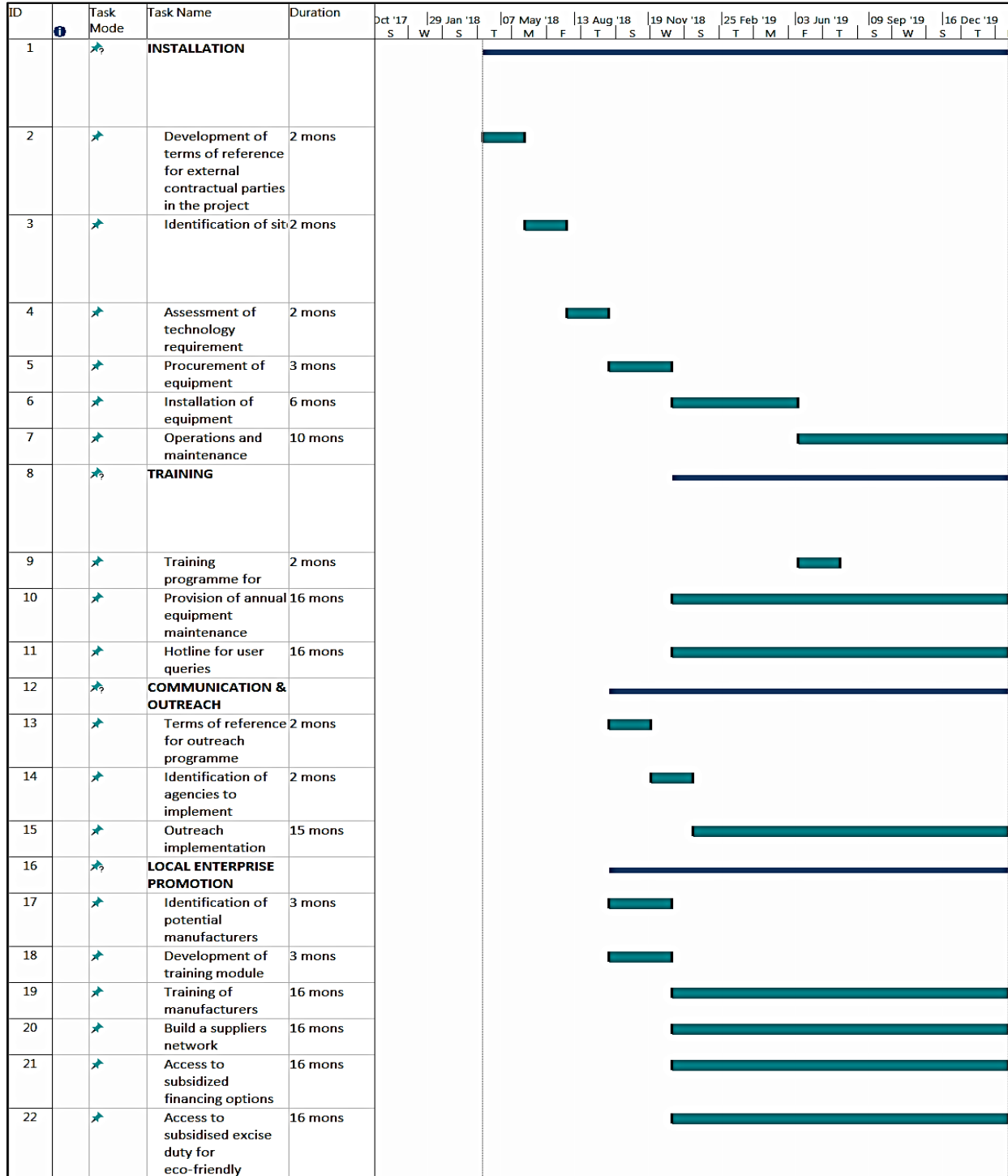
	<p>= 37500000</p> <p>Accessories: $70 \times 1000 + 25000 \times 70 = 17,570,000$</p> <p>Incidental Accessories Cost = 8,785,000</p> <p>Plinth Construction: $70 \times 1400 + 25000 \times 70 = 17,598,000$</p> <p>Incidental Plinth construction cost = $50\% \times 52240 = 8,799,000$</p> <p>Total budget $\approx 85,483,000$</p> <p>End Users Budget: 42,741,500</p> <p>Municipal Budget: 42,741,500</p>	<p>Plinth construction: 1400 per unit / 700 per unit</p> <p>Municipal bodies to share these costs with end users at 50:50 ratio.</p>	
5	<p>Activity Budget</p> <p>6 trips = 6×5800</p> <p>Total budget $\approx 34,800$</p>	<p>This activity is the primary responsibility of the equipment providers. The municipal officials to do pilot inspection. 6 visits over a period of 6 months by 2 officials.</p> <p>Site visits: 6 by two staff members Total distance: 154 kms per trip (based on area of the district) Fuel efficiency: 11 km/l Gasoline: 14 lit @ 50 = 700 per trip Personnel = 3000 per trip</p> <p>DA: $397 + 128 = 525 + \text{Mark up } 100\% = 1050$ per trip</p> <p>Trip Expenditure = Fuel + Personnel + DA = $700 + 3000 + 2 \times 1050 = 5800$ per trip</p>	
6	<p>Total budget ≈ 0</p>	<p>As this is an activity where end users are to take action. The incidental costs for the municipality are therefore assumed to 0. The municipality will organize training for the end users to ensure they are trained enough to operate and pursue regular maintenance of the equipment. This is included in the 'training' action.</p>	
7	<p>Activity Budget</p>	<p>Total Installations: $25,000 + 50 + 20$</p>	

	<p>6 trips = 6*5800 Total budget ≈ 34,800</p>	<p>Half day on site training for users. For households this is to be done in batches of 50. For instructions i.e. schools and public bodies, this is to be done in batches of 10.</p> <p>Total Training: $(25000/50)+(50/10) + (20/10)$ = 507</p> <p>Training material and implementation of training to be provided by equipment suppliers. The municipal body has monitoring and inspection task.</p> <p>It is assumed that 6 visits over a period of 2 months by 2 officials will suffice.</p> <p>Site visits: 6 by two staff members Total distance: 154 kms per trip (based on area of the district) Fuel efficiency: 11 km/l Gasoline: 14 lit @ 50 = 700 per trip Personnel = 3000 per trip</p> <p>DA: $397+128 = 525 + \text{Mark up } 100\% = 1050$ per trip</p> <p>Trip Expenditure= Fuel + Personnel + DA = 700 + 3000 + 2*1050 = 5800 per trip</p>	
8	<p>Number of Staff days=11 HR Expense=$(11/22)*30,000$ Total Activity budget ≈ 15,000</p>	<p>Provision of annual equipment maintenance and a helpline for user queries is a part of the arrangement with equipment suppliers. The expenses on behalf of the municipality are included in the staff hours spent in the development of terms of reference. A contingency expenditure of 11 staff days is kept here for receiving feedback on maintenance services/helpline from ward level representatives and NGOs.</p>	
9	<p>Number of persons: 5 Work Days: 3 Number of Staff days=$5*3 = 15$ HR Expense=$(15/22)*30,000$</p>	<p>The assumptions here are same as those in WN 1/WN3 Includes tender floating time</p>	

	Total Activity budget ≈ 20445		
10	Number of Staff days=22 HR Expense=30,000 Total Activity budget ≈ 30,000	Identification tasks include finalizing the proposals from shortlisted agencies including negotiations among key stakeholders for roles and responsibilities for implementation of outreach activities and expert consultations.	
11	Outreach budget – 220,000 Total Activity budget ≈ 220,000	The budget of the outreach programme will depend on the desired scale and intensity of activities within the outreach programme. This would typically depend on municipal finances. The Water Research Commission (WRC), which has committed to R880,000 finances for research and dissemination component to Vivendi’s water project in 2000. We assume that the iLembe municipality would be willing to spend 25% of this amount in the current time for outreach and awareness activities.	Durban Metro Water Case study https://www.wsp.org/sites/wsp.org/files/publications/af-durban.pdf
12	Number of Staff days=22 HR Expense=30,000 Total Activity budget ≈ 30,000	Identification of potential manufacturers will primarily involve local bodies, industrial training institutes and other local organizations to identify grass root innovators and potential entrepreneurs.	
13	Number of Staff days=22 HR Expense=30,000 Days for technical support Days by Technical university to develop and implement training module – 22 days Expense=30,000 Execution and implementation of Design Training for innovators – 22 Days Expense=30,000	Training has two components. The technical component (which has two parts) and the administrative component which is mainly th 1) The local technical university will have include courses that incorporate training for installation and O&M of the system. 2) Design training making prototypes of grass root innovators production viable. Apart from this, there is administrative support from the municipal body to organize these trainings.	

	Total Activity budget ≈ 90,000		
14	Execution and implementation training for potential entrepreneurs. – 22 Days Expense=30,000 Total Activity budget ≈ 30,000	Fundamentals of finance training from local university for potential entrepreneurs. This is to be primarily implemented by a local university with support from municipal body providing potential entrepreneurs training on financing alternatives and supporting them to establish themselves as local equipment or spare part suppliers.	
15	Execution and implementation training for potential entrepreneurs. – 44 Days Expense = 60,000 Total Activity budget ≈ 60,000	Local suppliers' network can be facilitated in more than one ways and the budget depending upon the scope and size of the network. Since the implementation scope is limited to iLembe district, the municipal body can provide basic network support through directories, supplier website and providing exchange forums.	
16	Total Activity budget ≈ 0*	Municipal body can facilitate access to subsidized financing options in order to promote local manufacturing. As the scale and scope of manufacturing is not known, it is difficult to estimate the quantum of subsidy required. For now, the budget of this activity is assumed to 0.	
17	Total Activity budget ≈ 0*	Municipal body along with the revenue service and provincial government can provide excise duty subsidy for promoting local manufacturing. As the scale and scope of manufacturing is not known, it is difficult to estimate the quantum of subsidy required. For now, the budget of this activity is assumed to 0.	

Gantt chart for activities schedule⁹



⁹ Monthly schedule for 21 months. The technology is expected to last 10 years with regular maintenance.