



Global Adaptation Network (GAN) and Durban Adaptation Charter (DAC) Regional Knowledge Sharing Exchange Visit

23rd – 25th November 2016

Pemba, Mozambique



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Executive Summary

As part of the Durban Adaptation Charter Hub and Compact initiative, eThekweni Municipality led the development of a proposal for a regional knowledge sharing & exchange visit through the Global Adaptation Network's funding announcement. This exchange between Mayors and officials from the Mozambican cities of Pemba, Quelimane and Nacala and officials from the South African city of Durban took place from the 23 - 25th November, 2016, in Pemba, Mozambique. The exchange built upon a previous DAC exchange where a Pemba and Quelimane delegation led by their two mayors and officials undertook an exploratory visit to the city of Durban to investigate potential areas of collaboration particularly within urban adaptation planning. The trip was successfully completed, but funds to build upon the outcomes of this trip were not available until the United Nations Environment Programme (UNEP) funding opportunity emerged through the Global Adaptation Network (GAN).

The exchange visit workshops were attended by 16 participants drawn from the four participating cities as well as a member of the GAN Secretariat and an ICLEI Africa expert. Issues discussed included local climate change challenges related to coastal and catchment management and solutions to better manage climate change impacts within Mozambican cities.

This exchange visit aimed to build capacity through training workshops and site visits for the establishment of collaborative regional partnerships between neighbouring municipalities and the development of project proposals to implement identified actions emerging from the exchange. This was achieved through expert-led workshops and dialogue between parties on topics mutually agreed by the parties. This was augmented by site visits hosted by technical experts to share implementation methodology.

The eThekweni Municipality offered expert advice and input as a local government who has some experience in coastal and catchment management challenges such as erosion, flooding and sea level rise. The aim of the workshop was to initiate knowledge sharing and the development of ideas for project proposals to implement identified actions emerging from the exchange.

Overall, the workshop was deemed to be a success and all participants indicated that such workshops should include more time to work together to work through solutions to the climate change challenges they experience.

Introduction

The Durban Adaptation Charter (DAC) was the principle outcome of the Durban Local Government Convention, held during the COP17/ CMP7 climate negotiations in Durban in 2011. The DAC, hosted by eThekweni Municipality, is local government-led and focused, with a signatory base that now exceeds 1000 cities and district municipalities, covering 45 countries, with the majority being African, and many from the sub-Saharan region. One of the DAC ten principles states that signatories accelerate their adaptation efforts through committing to “Promote partnerships at all levels and city-to-city cooperation and knowledge exchange”. This is in alignment with the Paris Agreement, and has given rise to a number of learning exchanges between DAC signatories designed to build capacity through knowledge sharing and peer-to-peer exchanges. This experience in conducting previous exchange visits enabled eThekweni Municipality, more commonly known as Durban, to submit a funding proposal through the Global Adaptation Network (GAN) for this regional knowledge sharing exchange visit with Mozambican cities.

The proposal was discussed during ICLEI – Local Governments for Sustainability’s Resilient Cities Congress in July 2016. The proposal sought to build upon existing climate change-focussed work in the sub-continent and served to further strengthen regional partnerships.



Mayors Tagir Carimo (Pemba), Rui Chong Saw (Nacala) and Manuel de Araujo (Quelimane) are regional leaders addressing climate change adaptation in Mozambique.

The purpose of the exchange visit held in Mozambique from the 23rd - 25th November 2016 was to foster discussion through which experiences, opportunities and challenges of coastal erosion, catchment management and sea level rise could be shared between the South African city of Durban

and the Mozambican cities of Pemba, Quelimane and Nacala. The workshops were led by technical experts from Durban and the participants in the workshop were engineers and officials drawn from the three Mozambique cities. The programme for the exchange was co-developed by the participating cities' delegates, using material available and the outcomes from the first exchange visit.

In total there were sixteen participants drawn from the four participating cities as well as a representative from the Global Adaptation network and another from ICLEI Africa.

Name	City/Municipality	Designation
Tagir Àssimo Carimo	Pemba	Mayor
Rui Chong Saw	Nacala	Mayor
Manuel de Araujo	Quelimane	Mayor
Momade Amade	Nacala	Director
Crisanto Paulo	Nacala	Chief
Armando John	Pemba	Senior advisor
Derek Carlos	Pemba	Economist
Gideon Carlos	Pemba	Architect
Joan Brito de Araujo	Quelimane	Director
Fernando Pequeno	Quelimane	Advisor
Luke Moore	ICLEI	Coastal Management
Essey Daniel	UNEP	Project Manager
Andrew Mather	Durban	Project Executive
Geoff Tooley	Durban	Manager: Catchment Management
Sean O'Donoghue	Durban	Manager: Climate Protection
Kathryn Kasavel	Durban	Senior Environmental Technician



Day One

Mr Armando John, Senior Advisor to the Mayor of Pemba welcomed participants to the DAC exchange visit and highlighted that this workshop contained the most prominent climate change officials from the participating cities. The Mayor of Pemba, Mayor Tagir Àssimo Carimo and the Mayor of Nacala Mayor Rui Saw were introduced and Mayor Carimo stated that Pemba has been facing climate change issues in the city since 2014, and have started to address it. Dr Sean O'Donoghue, Manger of the Climate Protection Branch of eThekwini Municipality thanked Mayor Carimo for hosting the delegation and stated that this process will show how leadership can drive climate change work in cities. The opening session concluded with the handing over of a gift and a message of support from the Mayor of Durban, Ms Zandile Gumede, to the mayors of Pemba and Nacala.

Mayor Carimo and Mayor Saw were interviewed about the climate change challenges they experience in their cities and the importance of leadership. These interviews will be used by the GAN as part of the workshop feedback, as well as within a special DAC-focussed edition of the Climate Adaptation Knowledge Exchange (CAKE) website.

An introductory presentation on the purpose of the exchange visit and the Hub and Compact approach was provided by Dr O'Donoghue. A summary of the key issues raised are outlined below:



Dr O'Donoghue presented the Mayors of Pemba and Nacala with hand woven wire baskets on behalf of eThekwini Municipality.

The international framework of agreements including the Sustainable Development Goals and the Paris Agreement should guide the development trajectory of cities along a low emissions pathway consisting of multi-level governance which the Hub and Compact approach endorses. Partnerships cannot exist if there are no links between institutions, cities, and national government. Partnerships are beneficial in poorly resourced municipalities as scarce resources and skills can be pooled.

The scale at which climate change work should be conducted is important. If there are flooding and erosion problems in an area the entire catchment should be considered for a solution. Often problems manifest further down the catchment, whereas the solution may be found higher up the catchment, even outside of a municipality's political boundary. That is why a catchment-based partnership approach is useful.

Natural ecosystems and communities should be at the core of climate change adaptation effort. Dr O'Donoghue referred to the Palmiet Rehabilitation project within the uMngeni Ecological Infrastructure Partnership in Durban. In that example, communities and other catchment stakeholders were brought in to planning processes to address challenges through a climate change filter. Despite limited funding being available, the project is growing in stature and accomplishments as there is a committed core of project actors, extraneous of the Municipality. This core includes leadership from informal settlement communities. The project has had some interesting learning outcomes; residents of an informal settlement community believe that heavy recent rainfall and flooding events were exacted by the Inkanyamba, a snake-like creature in the traditional belief system, which was believed to be restless because of anthropogenic changes to the river system. Interestingly, this particular belief is underpinned by reality, where flooding is exacerbated by the addition of storm water drainage into the system. The Inkanyamba, according to Mayor Carimo, has an equivalent within the people of Pemba, who believe in a seven headed snake known as 'Hanasie' that causes the 'craters' and gullies in Pemba. City officials have used this belief as a mechanism to convince people not to inhabit high risk areas. This shows the value of traditional beliefs.

Partnering with universities is encouraged within the DAC Hub and Compact model and it was found that Pemba and Quelimane do have existing partnerships with their universities. Their universities were invited to be part of a council to guide land use planning. Community leaders, NGO's, traditional and administrative leaders, municipal technical teams, provincial government, water and sanitation, climate officials and political leaders are involved in the council. The university representatives are to strengthen and chair the meetings. Meetings were held with the university to work on implementation of projects in the community however they did not include a cost benefit analysis. The municipalities are also trying to integrate the sharing of information between students. The universities are also found to be humble in that they don't laugh at the incorrect use of terms e.g. 'Crater' versus 'deep slope'.

The students come to the municipalities for research, identify gaps and make recommendations, however no centralised capture of this information is made so archival of these recommendations is required. This requires technicians and time to work on it. EThekweni Municipality also had a similar issue but hired an academic to translate student research documents into summarised recommendations for the municipality. Dr O'Donoghue suggested that students can also be told what research to do that would help the municipality. Mr John explained that the teachers in Pemba are informed of climate change and advise students on what they can study. Dr O'Donoghue expressed the importance of transdisciplinary research. Mayor Saw asked where the funding would come from for implementation when students do provide recommendations and Dr O'Donoghue highlighted that funding for research should be built into large scale project funding proposals, for example with the Green Climate Fund. Working together in partnership at the appropriate scale of project will result in the best solutions.

The city of Nacala is faced with serious erosion problems due to topography and land use changes, and this will be exacerbated by climate change. Sediments are being deposited in the deep water port threatening its capacity. Mr Geoff Tooley suggested catchment management solutions that included removing alien vegetation, addressing storm water management, installing attenuation facilities and using in-situ communities to do this work whilst broadening their understanding of the issues.

It was suggested that cities should engage in partnerships with their surrounding municipalities, for example Mayor Carimo engages with surrounding areas. Dr O'Donoghue highlighted that cities should be encouraged to form Compacts to partner with their surrounding areas.

It was agreed that we as African leaders need to drive climate change action, despite political uncertainty internationally.

Action: Dr O'Donoghue will share the exchange presentations with all participants.

The participants discussed how such actions could be operationalized. The Mozambican national government has started developing a Green Climate Fund proposal. The cities should take the outcomes from the exchange visit to this process to ensure that they are part of the funding proposal. A set of principles which unit DAC cities in addressing climate change should be considered a key part of the funding proposal. This will align the Mozambican proposal with the proposal being developed in Durban.

Action: Mr Essey Daniel will send the contact details for the Mozambique focal point for the GCF proposal.

Catchment Erosion site visits

Visits to areas of catchment erosion sites were conducted in the afternoon and the following points were noted for each site:

Site 1





A large gully caused by erosion was running through a community on a property site and if left unattended, will erode over the road and keep eroding up the slope through the community. Mr Tooley advised that attenuation weirs could be added to slow down the flow so there is less drainage and less soil erosion. The community will need to understand why the weirs/dam will be there so it does not get polluted/blocked. Mr Tooley advised that a computerised hydrological model that is being developed with the University of KwaZulu-Natal (UKZN) could be used to look at what solutions are possible or where the solutions should be in the catchment. The solutions should emanate from not only Engineers but Town Planners etc. and it cannot all be done at once. One project should be done first then how resources can be developed to do the others can be assessed. Storm water can be re-used for other things such as green roofs.

Site 2



There is a large gully running through the community. People are taking soil to build houses which worsens the problem however the main problem is that there is too much water and pollution. Maintenance will not stop the source. Developers should be told to attenuate water where they develop. All fields of work can provide input to make the site more resilient. Communities should also be brought into the projects to create ownership. Communities could be paid to maintain the area with regards to pollution and alien invasive growth. It is better to spend the money in the communities rather than on fixing the roads, electricity etc. that results from the pollution and alien plant growth. Officials need to convince the City that it is just a redirection of money when communities are paid to maintain these problem areas. The communities can use the cleared road

area and they can work with the municipality to see where the best areas in the catchment are to plant food. This will improve the quality of life of the people.

Site 3

There is a large gully in which a set of gabions has been built onto to prevent further erosion; however the water is still cutting through on the top sides and bottom path. The land above the gabion should be channelled in the middle to prevent water flowing down the sides of the weir, eroding the soil and risking the weir stability. A natural spring, filtered through the soil, has emerged at the base of the gabion, which the community is using as a resource for washing, bathing and drinking. The weir is acting as a filter. Water running off from the surrounding development can be slowed with attenuation facilities (like rainwater harvesting tanks and soak ways) to make the water flow slower and protecting the existing structure while allowing the community to still use the water. Mr Tooley expressed that often in times of challenges, other opportunities can be found. Solutions should include how to help nature do what it does best. Flow velocity slows substantially as the stream exits the mini canyon so no further erosion downstream should occur.

Site 4



There is large scale erosion in a gully at the side of the main road that is sloping into the community at the bottom. The wall that was built to hold the soil up at the side of the road has partially collapsed putting the road and community at risk. This site needs an Engineering solution and a consultant should be contracted to design a solution. One potential solution would be to direct road-based run-off down a vertical shaft and to release it in a series of attenuation facilities that would slow down the run-off making it less erosive.

Site 5





The community is living adjacent to a tidal lagoon. Solid waste has stopped water flowing in and out. The people should not be moved out but rather the area should be regulated and better managed. This presents an excellent opportunity for a community-based lagoon rehabilitation project that could help residents rediscover the sense of place that was apparent twenty years ago.



End of Day One.

Day Two

Mr Tooley presented on shared challenges in respect of flooding. The eThekweni Municipal Adaptation Plans (MAPs) use modelling systems to predict rainfall. An example of a storm water runoff hydrograph model was presented. A summary of the key issues raised are outlined below:

- More roofs cause faster runoff causing erosion and gullies.
- Multi-use dry dams and attenuation dams can reduce flooding.
- Engineers should work with Town Planners to see where developments can be approved without exacerbating downstream flooding.
- Riparian areas (stream banks) should be rehabilitated to prevent erosion. Mr John stated that there are people in Pemba who clean the rivers of rubbish. Durban uses cooperative of communities to monitor and undertake river cleaning/ maintenance. These community members then become small businesses who take ownership of the river. The first step was to approach the community to explain the ideas behind the project. The city helped them form co-operatives and keep their own books for tax purposes. They were effectively hired through tender processes as consultants for a three year contract for monitoring a 5km stretch of stream. They used photo evidence to show work done to get paid. Contracts were also awarded for supervisors of this project. The National public works programme was used for this project and it had a budget of R10 million. The cities in Mozambique can look for other options with National government, universities and corporate companies if they do not have these structures in place. The rivers could also be easier to maintain after a big clean up. The eThekweni Municipality river clean-up Sihlanzimvelo Project brings many benefits and different types of saving with the cleaning out of rubbish, creation of jobs, leaving capacity and increased knowledge in the community and changing habits and ways of life.
- The MAP's also show natural infrastructure can be used to save on costs.
- Nacala has used data from Pemba as a reference in city planning as they are both coastal cities.



Google Earth maps were useful for visualising problem areas and solutions of the other cities. A key benefit was the ability to see the big picture identified the source of the problems. It was found that the sites that were visited the previous day were actually within the same catchment area. It was clear that a solution near the head of the catchment would be beneficial for all the sites downstream. This was a particularly powerful learning experience.

The following discussion points were made for the cities of Nacala and Quelimane.

Nacala

Nacala's erosion problem that threatens its deep water port has serious implications for Africa as the port services Malawi. There are actions to reduce risk and adapt to climate change such as making roads and rail infrastructure more resilient. Nacala have a plan that is approved by their local assembly. The main challenge is sediment deposit in the port, reducing the depth of the port and risking the loss of its investment capacity. A second problem is the erosion under the main railway line that connects to Malawi. Dr O'Donoghue suggested that principles associated with solutions discussed as outcomes from this workshop can be used to address these problems. These principles of best practice include community involvement (in planning, implementing and maintenance of projects), ecosystem based approaches, innovation, developing partnerships and implementing the DAC principles for adaptation. Communities need food and resources and currently rely heavily upon ecosystem services. This dependence would be reduced through community- ecosystem-based adaptation (CEBA) approaches. Effectively, communities are paid to protect the environment.

Nacala require more capacity building, need to be kept up-to-date and need to keep training the people as soft solutions. An example of hard solutions required would be gabions that can only be put in place with funding. Soft and hard solutions should be combined. The national government should manage the port as it is used by the national government of Mozambique for trade. The trucks from the harbour also cause erosion issues of which the national government should address. The national government is not remunerating Nacala for efforts to adapt to erosion challenges. Dr Andrew Mather suggested that the sediment that is filling in at the port be used as landfill to extend the port's capacity. The Nacala officials agreed that they need to be more proactive in their approach. A cost benefit analysis could be undertaken as part of the project proposal development process.

Quelimane

Residents of Quelimane are harvesting mangroves for food and building materials. Even though the government is adding mangroves they are still cutting them down. Quelimane experiences flooding as the areas used to be rice fields. When it rains water collects in the areas and thus houses need to be raised. There are pilot resilient houses currently being built. It is dangerous where people are living as they are only four metres above sea level. The whole city may need to be raised as they are concerned Quelimane might disappear due to sea level rise. Behaviours need to be changed such as the cutting of mangroves but another source of income will need to be in place to replace those activities. The coconut trees in Quelimane are also dying of yellow disease which means a loss of income and food sources. Dr Mather pointed out that Quelimane also has old paleo shorelines (visible on the Google earth tool). This would provide an interesting research topic. The question remains if the people of Quelimane should move to a different area or defend the city against these impacts of climate change.

Sea Level Rise site visits

In the afternoon, a number of sea level rise-focussed sites were visited at the various beaches along the Pemba shoreline, mostly in the north of the peninsular. Suggestions of using geo-fabric bags to stop sediment erosion and adding pipes to remove stagnant water were made by Dr Mather and Mr Tooley. There had been a misconception about wave undercutting of beach rock previously; Dr Mather indicated that this was a normal process and that the beach rock was providing excellent protection where it had not been removed. Harvesting of beach rock should be strongly discouraged, as that is the last defence against storm surge.



End of Day Two.

Day Three



Dr O'Donoghue presented Mayor Manuel de Araujo of Quelimane with a hand woven wire basket on behalf of Mayor Zandile Gumede.

Mayor Manuel de Araujo of Quelimane was welcomed to the workshop on the final day of which he was able to attend (having been hamstrung by flight cancellations previously). Mr Luke Moore, Urban Expert: Spatial Planning & Coastal Zone Management at ICLEI Africa also joined the workshop on this day and presented on the importance of coastal zone management. A summary of the key issues raised are outlined below:

- Shipping represents the largest method of world trade and the Mozambique coast was described to be a valuable resource but also high risk area.
- Mr Moore described the traditional approach to coastal management and defined integrated coastal zone management. The cities should use a vision to be the most beautiful city. They should review the work done in other cities to see what others are doing in coastal zone management.
- Mayor de Araujo felt it was important to understand the extent of the problem and how it can be handled with the existing capacity to avoid maladaptation.
- Mr Moore provided an example of the Share Water for Africa Integrated Coastal Management plan which looks at issues of water and sanitation under conditions of climate change and what impacts there will be in the South African perspective.
- Dr Mather suggested that an environmental department will need to be set up for implementation in Local Government Associations or integrated into other line functions. A champion will be needed to drive it but it does not need to come from one department.

Dr Mather then presented on coastal engineering and sea level rise and a guideline book was given to participants. The following points were raised:

- Some countries can co-exist with sea level rise it and some need to adopt retreat tactics.
- Sediment dynamics are not related to sea-level rise and can be changed by an event. The best option would be to look at photos over time periods and use local knowledge of the area to develop a better understanding of coastal processes in an area.
- Facilities can be re-located if necessary but officials cannot only address the symptom but need to fix the problem. A technical champion is needed to create understanding amongst others.
- The national government does not implement so the budget goes to local governments who are held responsible for implementation.
- Mozambique has no national coastal Act but there is an environmental act that includes a section for coastal management.

Google Earth maps was used again to review the cities and define principles for action.

Nacala

Nacala is not actually on the coast but in an inland waterway. It has a deep port and two docking stations. The port is a key national point to trade with Africa. Sediment is being deposited there from the catchment. The port needs to remain deep so the sediment must either be dredged or used for port expansion. The roads also get blocked from catchment sediment. People are living in risk areas near the port but they locate there for the jobs. Dr Mather highlighted that the sediment is sub-tidal and it is going to be moved around. Nacala is on a slope and want to expand on the ridge for tourism downward towards the beach.

Principles:

- A partnership approach with other municipalities is required
- Communities should get involved.
- Research partnerships should be established to guide the development of projects. Research should involve hydrological modelling, including rainfall patterns in catchment management.
- Low carbon planning is required.
- Master Planning must be included and Nacala can work with UNEP about the expansion. Businesses and tourism should be encouraged around the port.

The Nacala officials expressed that when they approach the Mozambique government they can present these principles for proposal.

Quelimane

There was clear visible evidence of paleo shorelines in the Google earth imagery i.e. historical shorelines associated with the development of the Zambezi delta and different sea levels near of Quelimane. This shows the dynamic nature of the coastline and suggests how the coastline will move under sea level rise conditions. Obviously this will impact upon the city of Quelimane. Using Google Earth imagery enabled this discovery to be made, showing the value of this tool. A risk assessment exercise will need to be conducted. The Mayor should be remembered as the one who implemented the necessary research. This could be a legacy. Currently, the sea has retreated but Quelimane is at

sea level and at risk to sea level rise. Flooding may also occur from rivers as flood waters backfill from high tides. There were 10 bridges lost in 2015. Quelimane has a large catchment area. Quelimane needs a way to harvest water for when it is required and to attenuate flooding on a large scale. Dams can be put in place in the flow paths to capture water and people are required to collect roof run-off to save their own reservoirs. The coconut trees are dying of yellow disease and thus the people are using mangroves to build houses.

Principles:

- Natural systems should be restored such as the mangroves.
- Sustainable urban drainage systems should be employed, including green roofs.
- Research is required for how water can be attenuated and this can be done via national government.
- Food security is an issue as the rice fields are being affected by salt water intrusion. Alternative land needs to be found through research.
- Water improvement is required.
- Sanitation issues should be reviewed due to cholera and health issues. Waste management is necessary as human waste could be used as raw products in low technology systems and innovative planning. Mr Tooley provided an example of the Black Soldier fly that eats human waste and produces food for animals, building materials and soap.
- Shared learning can assist by showing what projects can be put in place.
- Ways of transforming society that are sustainable are needed.

Pemba

Pemba has good beach rock protective infrastructure on one side and sediment deposits on the other. Risk areas will need to be identified to prioritise action. Mangroves are needed to stabilise the coast as people are using them to construct houses. Alternative housing material is needed. National planning should make sure new developments are located inland beyond the impacts of sea level rise. Coastal access is still required as there is cultural significance in some areas as in the lagoon site which must be restored and protected from the deep slope runoff issue at the top of the hill.

Principles:

- Catchment management.
- Creating resilient communities.
- Addressing causes not problems (gullies).
- People don't understand they are living in risk areas but the informal settlements cannot be removed. A way of making the people understand the threat and working with them for solutions needs to be found. They will see that the city is trying to protect them. Behaviours could be changed by using the cultural sensibilities.
- Dr Mather suggested that the north-facing coastline should have coastal management planning and the mangroves south of the harbour should be rehabilitated. The area needs environmental protection and stabilisation.
- The large gully that leads into the wetland requires catchment management research.
- The pumping capacity is slow as reticulated water is pumped from 50 kilometres away.

Way Forward

- Miss Kathryn Kasavel, Senior Environmental Technician from eThekweni Municipality will draft the report for the exchange visit and it will be circulated for review.
- The sets of principles of best practice will be used to plan projects.
- The cities should connect with surrounding municipalities to form Compacts.
- The EPIC-N opportunity to attend Resilient Cities training event should be pursued as a precursor to starting transdisciplinary research partnerships in the cities.
- A spokesperson will need to be elected to start the process and develop the projects that must be included in the National Development Plan to get funding. One of the political leaders needs to take charge of it. The spokesperson must have a good relationship with Mozambican Environmental Affairs. The Mayors should decide who it will be.
- Ideas are going to be required for the Green Climate Fund proposal. This exchange visit information should be shared with others as the more people who are involved the more people will be interested in solutions.
- A Skype call could be done once a month and Dr O'Donoghue will be the contact person from Durban. Mr John will be the contact person from Pemba.

Mayor Araujo thanked Dr O'Donoghue for organising the exchange visit and UNEP for the funding for everyone to be present. Mr John was thanked for hosting the event. As closing remarks it was noted that there is a lot of money out there and organisation funding can be sourced. Mr Daniel expressed that it was good to see the money get used and to see projects on the ground.



END



Appendix A: Attendance Registers



DURBAN ADAPTATION CHARTER (DAC), GLOBAL ADAPTATION NETWORK (GAN): REGIONAL KNOWLEDGE SHARING AND EXCHANGE



Pemba, Mozambique: 23rd November 2016

Day 1: Introduction to the Regional Knowledge Exchange Visit and the Durban Adaptation Charter Hub and Compact Approach

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DURBAN ADAPTATION CHARTER (DAC), GLOBAL ADAPTATION NETWORK (GAN): REGIONAL KNOWLEDGE SHARING AND EXCHANGE

Pemba, Mozambique: 24th November 2016

Day 2: Coastal Processes, Coastal Engineering and Adaptation to Sea Level Rise Workshop

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DURBAN ADAPTATION CHARTER (DAC), GLOBAL ADAPTATION NETWORK (GAN): REGIONAL KNOWLEDGE SHARING AND EXCHANGE

Pemba, Mozambique: 29th November 2016

Day 3: Adaptation to Flooding Workshop, Project Planning and Way Forward

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Appendix B: Results of Workshop Surveys

Five participants of the Catchment Management session and five of the Coastal Engineering session completed feedback forms. The responses are captured below for both sessions with regards to workshop experience, learning experience and recommendations.

Catchment management session

Workshop Experience

1. Overall, how would you rate the quality of the workshop?

- 80% said that the workshop was very good and 20% said it was excellent.
- The comments were:
 - “It was explained with real events in the city e.g. flooding.”
 - “Very practical and reality/evidence based.”

2. How would you rate the workshop’s ability to help you address the catchment management challenges your community faces?

- 60% said it was excellent and 40% said it was very good.
- The comment was
 - “(It provided) material to use and discuss the issues for good results.”

3. Would you recommend this workshop to others?

- 100% of the respondents answered yes to this question
- The comments were
 - “For other municipalities on the coast.”
 - “Central government officials and NGO’s working in the field of climate change would be very much served.”
 - “I would recommend this workshop to the organization dealing with climate change mitigation and adaptation and decision making at National level to know more about the problems and budget for the solutions.”
 - “To USAID Coastal City Adaptation Program; to other municipalities in Nampala Province and coastal cities like Ilha de Mozambique.”

Learning Experience

1. Please check the response that best represents your confidence *now*, having taken part in the workshop, and confidence prior to your participation. How confident are you that you:

- a) Understand catchment management that results in flooding?
- Before: 60% answered they were somewhat confident before the workshop and 40% said they were extremely confident.
 - After: 40% answered they were extremely confident after the workshop, 20% answered they were very confident and 20% answered they were less confident.
- b) Are able to identify possible approaches/adaptive measures to protect against flooding that are appropriate to your local context?

- Before: 40% answered they were extremely confident, 40% said they were somewhat confident and 20% said they were very confident.
- After: 40% answered they were extremely confident, 40% said they were very confident and 20% said they were less confident.

2. What are the main causes of flooding in your municipality?

- The comments were:
 - "Rain; Sea tides."
 - "Sea level rise; Human activities; Mangrove culling, Destruction of corals."
 - "Lack of green infrastructure and community empowerment in the catchment areas."
 - "It is the situation of the municipalities that are below the sea level."

3. What urban-based measures could you take to address flooding that occurs in your municipality?

- The comments were:
 - "Rain water harvesting; Building more drainage systems; cleaning the existing drainage systems."
 - "Building storm water catchment systems."
 - "Coastal erosion measures."
 - "Community empowerment; Research analysis; a drainage plan."
 - Organising the land planning and occupation; Extending the drainage system; Defining the habitability and building zones in the municipality."

4. From today's presentation list measures that you could use to develop a project proposal in your municipality

- The comments were:
 - "Community education; Mapping of the high risk zones; Research on the real risks the municipality is facing regarding the climate change."
 - "Consult national frameworks/Acts; Set up research partnerships; Involve the communities affected for their LEK and CBNRM."
 - "Yes because we see the report and we have to form a team."
 - "Drainage systems; Mangrove plantations; Storm water catchment system; Waste to energy (biomass, biofuel); Coconut plantations (resistant type); Intensify, analyse and research caused of the floods.
 - "Meet with key persons at the municipality, key stakeholders and the communities; Start developing the draft."

5. Name the steps involved in developing solutions to flooding in your municipality

- The comments were:
 - "Strengthen connections with Durban and Cape Town; improve links with UNEP, ICLEI and C40."
 - "Clean the drainage system; Raise awareness among communities."
 - "Team that you can ask and get solutions from for an event."
 - "Acknowledge/accept the problem; Research analysis; Create partnerships."

- “Establishment and maintenance of a drainage system; Try to find a suitable place to establish a water reservoir to use the rain water.”

Recommendations for Future

1. If this workshop were to be offered again, what aspects of it would you change?

- 20% did not answer, 20% said they would change nothing and 60% recommended the following changes:
 - “More time to discuss and share.”
 - “Increase the number of days for the workshop.”
 - “Economic alternatives for surveillance of the families depending on the national resources for survival.”

2. Please use this space to share any other thoughts/comments you wish to share with the event organizers. We would be particularly interested to hear about how the workshop has been useful to your work, how you expect the experience will impact your adaptation efforts back home, and how we can improve the design and delivery of our programs.

- Two Respondents answered with the following two recommendations:
 - “A two monthly follow up meeting in each city.”
 - “Funds available to visit other projects and sites.”

Coastal Engineering session

Workshop Experience

1. Overall, how would you rate the quality of the workshop?

- 60% said that the workshop was very good and 40% said it was excellent.
- The comments were:
 - “Presentations were excellent.”
 - “Good content; nice explanation; Good presentation.”

2. How would you rate the workshop’s ability to help you address the coastal erosion challenges your community faces?

- 60% said it was excellent and 40% said it was very good.
- The comment was
 - “Because we contact some of those problems and we learned how to try to fix them or prevent them.”

3. How could this workshop be more helpful to you?

- The comments were
 - “This workshop is more helpful because we could create exchange experiences between us as other regions in Mozambique and Africa as well.”
 - “The workshop was helpful.”
 - “If there was translation and more time to digest the information.”

- “To other municipalities in Nampala Province and coastal cities like Ilha de Mozambique; To USAID Coastal City Adaptation Programme”.

Learning Experience

The following are based on responses from 4 surveys as the fifth was not completed

1. Please check the response that best represents your confidence *now*, having taken part in the workshop, and confidence prior to your participation. How confident are you that you:

- c) Understand coastal processes that results in coastal erosion?
- Before: 25% answered they were somewhat confident before the workshop, 25% said they were extremely confident, 25% said they were less confident and 25% said they were very confident
 - After: 50% answered they were extremely confident after the workshop and 50% answered they were very confident.
- d) Are able to identify possible approaches to protecting against coastal erosion that are appropriate to your local context?
- Before: 25% answered they were somewhat confident before the workshop, 25% said they were extremely confident, 25% said they were less confident and 25% said they were very confident
 - After: 100% answered they were extremely confident after the workshop.

2. Name the four physical forces which erode/accrete shorelines?

- The comments were:
 - Two respondents: “Human intervention; Sea level rise; Mangrove culling; Destruction of corals.”
 - “Storm water; Removal of vegetation; Wind; Rainfall.”

3. Name the types of erosion and briefly describe these?

- The comments were:
 - “Clean the existing drainage system; Build more drainage systems.”
 - “Soil/land; Deep Slope.”
 - “Soil Erosion.”
 - Coastal erosion caused by sea level rise; Earth erosion caused by land misuse; Population.”

4. Describe three management strategies that can be applied to retreating coastlines

- The comments were:
 - “Training people on how to deal with the different solutions; Intervention with high technology to try to make houses more resilient; Stay far off those vulnerability areas.”
 - “Hold the line; Advance the line; Retreat; Do nothing; Move to safe areas; Do actions to prevent further erosion/sea water rise.”
 - Do nothing; defend the line; Advance the line.”

- “Start developing the draft; Meet with Communications.”

5. Name the three steps involved in developing solutions to erosion problems

- The comments were:
 - “Raise awareness among the communities.”
 - “Train people on how to deal with different situations; create the drainage that give the good orientation of water according to the main lines; Follow and maintain those areas.”
 - “Surface cover; Permeable pavements; Green roofs.”

Recommendations for Future

1. If this workshop were to be offered again, what aspects of it would you change?

- 50% said they would change nothing and 50% recommended the following changes:
 - “I will increase the number of days for the workshop.”
 - “I will increase the number of days of the workshop from 3 to 5 days.”

2. Please use this space to share any other thoughts/comments you wish to share with the event organisers. We would be particularly interested to hear about how the workshop has been useful to your work, how you expect the experience will impact your adaptation efforts back home, and how we can improve the design and delivery of our programs.

- Two respondents answered with the following two recommendations
 - “Help us in the implementation of our plans to solve the climate change problem.”
 - “Carry on with the partnerships and interact.”