

*Strengthening the role of civil society in water sector governance towards climate change adaptation in African cities – Durban, Maputo, Nairobi*

**IDRC Project 106002-001**

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**Kenya, Mozambique, and South Africa**

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### **1. Synthesis**

This project includes research partners at the University of KwaZulu-Natal in Durban, the University of Nairobi, Eduardo Mondlane University in Maputo, and York University in Toronto, along with local environmental and community development NGOs in Durban, Nairobi and Maputo. The project's main development goal is to strengthen the capacity of civil society to influence water sector governance towards climate change adaptation in three African cities – Maputo, Durban, and Nairobi. Its specific objectives are:

- to characterize the institutional framework for urban water governance in the three cities, and explain how the different actors within this framework cope with climate change and variability;
- to identify and test viable alternatives for enhancing civil society roles towards adaptation to climate change and variability by vulnerable groups (e.g. by developing education, training and awareness programmes); and
- to share widely the knowledge generated for potential adoption by other cities in Africa.

The project started in February 2010 and its activities are due to end by December 2012 with final reporting completed by February 2013. During this reporting period, which covers the beginning of the second year of the project's implementation, members of our team have fostered collaborative relationships between community-based organizations and NGOs and universities in Durban, Maputo, and Nairobi. NGO staff members and university researchers are working together in each city to continue conducting environmental education and workshops in the cities' low-income areas where water and climate change stresses are particularly evident. Each country team has convened and/or attended meetings with local government officials where the project's climate change and water management objectives have been discussed. Research assistants are now working within each partner NGO to characterize urban water governance frameworks in ever-greater detail and to develop locally-appropriate ways of enhancing civil society's role in responding to climate change. The academic members of our research team have selected student interns to work with the NGOs and assist in documenting the project's processes, methods and findings. We are editing the information on climate change impacts and civil society's current responses and needs in each city which was shared at our first team meeting, and a manuscript including this information is nearly complete, ready for wider dissemination in published form and on the project website. All of these activities were included in the original project plan, methodology, and scope; in the following sections of this report we provide additional details and relate these initiatives to the project's objectives and original activity plan.

### **2. The Research Problem**

Climate change is causing coastal erosion and periodic flooding in both Maputo and Durban, endangering scenic coastal roadways and causing saltwater intrusion, wind erosion, and desertification in urban food-producing areas; flooding in coastal slum areas; degradation of water quality in wells and potable water scarcity; and in Maputo the destruction of mangroves and threats to the locally-important shrimp fishery. There are clear signs that the sea level is rising, with concomitant expensive coastal management problems. The United Nations Habitat Cities in Climate Change Initiative emphasizes local government capacity-building, policy dialogue, climate change awareness, public education, and developing coordination mechanisms between all levels of government as priorities to help address these risks. Mozambique's national water law (1991) considers all water as state-owned, to be governed by the state for the benefit of the population, with water access for people, sustainability, and stakeholder participation as priorities. Four water basin committees have been established in Mozambique on the same general model as in Brazil. To make this participatory model more effective, the largest need is for capacity-building and community organizing to deepen and strengthen civil society's involvement in water governance. As Mozambique's capital, largest and densest city, and the home of the main university in the country, Maputo has a key role to play in setting the standard for progressive urban governance and water management.

Durban's municipal government has already developed a local climate change adaptation strategy; like Maputo, Durban faces coastal inundation and storm surges related to sea level rise, hotter temperatures and heat waves, changed rainfall and storm patterns, slum flooding and reduced drinking water supplies due to climate change. Local policy initiatives rely for effectiveness on awareness and capacity regarding climate change risks and adaptive responses in civil society. As in Mozambique, South Africa is implementing watershed committees or "catchment management agencies" (CMAs) to decentralize decision-making and create a framework for integrating the needs of all stakeholders in water governance. Environmental education and confidence-building through capacity-raising are recognized as crucial needs in this process; for example, the Inkomati CMA has initiated outreach programs targeting rural poor, emerging farmers, women and youth. Grounded participatory research leading to accessible public education and responsive community-based programs with civil society organizations are needed to help address these significant water governance challenges. This type of action research is well-developed in Durban, partly due to the work of the Centre for Civil Society and its partner NGOs. Durban's proximity to Mozambique means that watersheds spanning both countries, and similar ecological situations, will help to facilitate the research networking of this project.

In Nairobi, severe pre-existing infrastructure needs are being exacerbated by water supply fluctuations and slum flooding related to climate change. Just as in Maputo and Durban, environmental awareness and education leading to more equitable governance processes are required. As noted by the Kenyan delegation to the 2007 UN conference on climate change in Nairobi, Kenya's adaptation focuses include education, good governance, human resources development and training, institutional capacity building and management change, public finance improvement, and better national resources management. Nairobi, one of the largest and most complex cities in the world, provides a

challenging arena for participatory governance research; results there are likely to have wide application in other large African urban areas.

Since this project was designed, both weather-related and socio-political manifestations of climate changes have advanced rapidly. Extreme rainfall and flooding in southern Africa in late 2010/early 2011 has lent urgency to our project's goal of contributing to improved water governance. For example, the lack of early warning systems for urban (and also rural) residents regarding flood danger, and of housing and other supports for flood refugees as well as prompt reconstruction funding mechanisms, are emerging as high-priority climate change-related governance needs. Durban's selection as the host city for the UNFCCC Conference of the Parties in late 2011 is creating an impetus for progressive climate change policy in South Africa, to which our project is poised to contribute. Patrick Bond and Wahu Kaara, two of our project team members, participated in the World Social Forum in Dakar in early February 2011, which also highlighted the urgency of climate change needs in Africa. Our project's importance and urgency are reinforced by these recent events.

### **3. Research Findings**

Our progress towards achieving the project's goals is outlined below. Since this project's methodology and our tracking of and building on its successes are important research contributions, we combine processes with outputs in our reporting in this section. The Objectives, Outcomes, Milestones and Activities listed below are quoted directly from the original project proposal; the numbering has been updated in a few places. At the end of this section, we provide a summary of our research findings thus far.

**Objective 1: To characterize the institutional framework for urban water governance in the three cities, and explain how the different actors within this framework cope with climate change and variability.**

*Outcome 1: Actors involved in urban water governance gain better understanding of the institutional framework that is in place for coping with climate change and variability.*

**Milestones/outcome indicator 1.1: Research reports.**

**Milestone/outcome indicator 1.2: Actors involved in urban water governance able to clearly articulate the institutional framework for coping with climate change and variability.**

**PROGRESS IN THE LAST REPORTING PERIOD:** At the Inception Meeting (see Report 2011A2) in Brazil, in August 2010, academic and NGO team members shared their presentations on climate change and urban water issues in relation to their work. These presentations and subsequent workshops allowed team members to discuss their current challenges and learn from one another. The presentations made during the inception meeting have been transcribed and documented, and now appear on the project's website at <http://caa.iris.yorku.ca>.

**PROGRESS IN THIS REPORTING PERIOD:** Team members have held initial planning meetings in each of the three cities to discuss the institutional framework for urban water governance. Reports of some of these meetings appear in the Appendices.

### **Durban**

In Durban, team members are involved with many different actors in their work on water and climate change in the city. Team members from both Umphilo waManzi and the South Durban Community Environmental Alliance attended a January 2011 workshop regarding the National Climate Change Response Green Paper, where a number of government officials and community organizations working on water and climate change were in attendance. Both of our Durban NGO partners will be making significant contributions to the development of Durban's climate change initiatives.

In February 2011, Umphilo waManzi held a meeting, where traditional authority and councilors were introduced and stakeholders identified in the following communities: Umzinyathi, Hammersadale, Umbumbulu, and Ntuzuma/ Piesang. According to Mary Galvin, Umphilo waManzi's Executive Director, "what has arisen from this meeting is a dire need to support and assist with action steps, both advocacy with eThekweni and other government departments and moving communities to action through local advocacy." Dr. Debra Roberts from the eThekweni Municipality Environmental Management Department, and Neil MacLeod of eThekweni Water were in attendance at this meeting. Participatory local assessment workshops in these communities began in March.

Also in March 2011, Umphilo waManzi held a Water and Climate Change Adaptation Workshop and stakeholder meeting, which was attended by community members and government representatives (see Appendix H), as well as the South Durban Community Environmental Alliance (SDCEA).

On July 15, 2011 Mary Galvin of Umphilo waManzi met with a representative from eThekweni Environmental Planning and Climate Protection Division to discuss issues identified in workshops as well as possible ways to collaborate.

In April, SDCEA had a workshop on COP16 and in May, one on COP 17 Strategic Planning. A total of 200 people attended these workshops, including residents of Durban and surrounding areas like Umkomaas, Ixopo, Merebank, Pietermaritzburg, Phoenix, and Newcastle. Although government officials were invited to these workshops, none attended. These meetings were intended to inform communities on issues of climate change, hear their experiences with climate change impacts and introduce them to local organizations working on these issues, such as SDCEA, but also TimberWatch and Groundwork.

### **Maputo**

In Maputo, team members and UEM students have organised several meetings with the National Directorate for Water (DNA), the National Department of Drainage, the Maputo Water Regulatory Council (CRA), and Waters of the Maputo Region, in order to gather information on the institutional framework for water governance in Maputo.

Through interaction with specific communities in local low-income neighbourhoods, the group has concluded that actors involved in water governance have some awareness about climate change and generally believe that improvement of sewerage systems and water management will lead to improved environmental health.

In the previous reporting period, MuGeDe organized a meeting with stakeholders, including the Ministry of Public Works, National Water Board, Waters of Mozambique, Water Supply Investment Fund (FIPAG), the Water Regulatory Council (CRA), Ministry of Health, Ministry of Planning, and the City Council. Other environmental organizations also participated, as well as Dr. Elias Manjate representing Eduardo Mondlane University. The purpose of this particular meeting was to introduce the project to community members and government officials, as well as to identify areas where the project could be implemented. According to MuGeDe, the meeting was moderately successful in establishing working relations with government officials.

Justiça Ambiental (JA) has had little to no interaction with the Mozambican government in relation to this project. This is due to the fact that two do not share the same views or opinions on many issues.

## **Nairobi**

The Nairobi team through Kilimanjaro Initiative (KI) invited Nairobi Water and Sewerage Company to attend their initial meeting held in Kibera, when the project was first introduced to the Kibera Community. In Addition, Elizabeth Wamuchiru and Stephen Otieno, two University of Nairobi students, have been doing research on the institutional framework for water governance in Nairobi and will present on this topic during the project's Second Annual Meeting in Durban. The students will also present their findings at a student symposium, which was held at the Centre for Civil Society (CCS) at the University of KwaZulu-Natal in late August.

Like the other country teams, the Nairobi team is currently developing its climate change and water governance contacts in the city government and among other NGOs.

*Each team is currently involved in researching and writing a summary of the institutional framework for water governance in their city for assembly into a project-wide synthesis document with information on climate change issues. The following is an excerpt from the project's Synthesis Report, which shall be submitted to IDRC in early 2012.*

## **Durban**

The Constitution allocated the management of water resources to National Government (National Water Act, 1998) and the management of water and sanitation services for all citizens to municipalities (local government) (National Water Services Act, 1997).

The eThekweni Metropolitan Municipality is the *local water services authority*, as defined under the Water Services Act, for the city of Durban. Since the municipality also provides water and sanitation services, it is also considered a *local water services provider*, under the Water Services Act.

The unit responsible for the provision of water and sanitation services is eThekweni Water and Sanitation. Its key priority at present seeks to eradicate the backlog in the provision of water and sanitation services.

The eThekweni Water Policy outlines tariffs and charges for water consumption and services in the municipality. Different tariffs are charged for domestic customers based on the type of water connection they have and also the amount of water they use in a 30-day period. Customers with a full pressure water connection also pay a fixed charge if monthly consumption is greater than 6000 L. In 2001, the Department of Water and Environmental Affairs (DWEA) (formerly Department of Water Affairs and Forestry) established its Free Basic Water Programme, which provides every South African household with 6000 L of free clean water every month (or 200 L/household/day). The municipality is ultimately responsible for setting this amount in compliance with the national minimum. In eThekweni, the minimum free basic amount was increased from 6000 L to 9000 L in 2008. All other customers are charged using a single tariff for the water that they use. In addition a monthly fixed charge is paid based on the size of the water meter for all full pressure water connections.

The major infrastructure that supports the provision and treatment of water to Durban (eThekweni Municipality) is operated and maintained by Umgeni Water. At a regional level, water supply to Durban is controlled through a series of dams on the Umgeni and Umlazi Rivers. Dams along the Umgeni River, from source to sea, include the Midmar, Albert Falls, Nagle, and Inanda dams and dams along the Umlazi River, from source to sea, include Baynesfield, Mapstone, Thornlea, and Shongweni.

In terms of water resources management, DWEA is responsible for overall management. At a regional level and local level, the regional office of DWEA carries out activities and promotes the creation of a catchment management agency (CMA) for its region, in the case of Durban this would be for the province of KwaZulu Natal. The regional DWEA office is located in Durban. Durban lies in the Mvoti-Mzimkulu water management area (WMA), which are areas identified in the National Water Act to structure how management activities are decentralized across the country. The Department is currently reassessing the number of water management areas in the country to better serve the goals of the National Water Act. There is currently no catchment management agency established for this WMA. Each CMA is responsible for the progressive development and broad implementation of a catchment management strategy. DWEA in KwaZulu

Natal is working with water user association and catchment management forums to initiate participation in the catchment to form a catchment management agency.

## **Maputo**

Water provision/supply in the City of Maputo

The City of Maputo gets its water from two sources: The Umbeluzi Basin and *Maputo*, the former being principally responsible for supplying water to this city. This *supply system* is managed by Waters of the Maputo Region through *entities* of the National Directorate for Water (DNA), within the Ministry of Public Works. The National Directorate of Water is a public institution responsible for ensuring the implementation of policies relating to the provision, distribution and treatment of water at the national level.

In 1998, the Mozambican Government established the Water Supply and Heritage Fund (FIPAG), “a public entity, which acts as asset holder and investment manager in the sector. FIPAG leases out operations and management to private operators for defined time periods. FIPAG has the responsibility for investment and financial management related to rehabilitation and expansion of water supply assets, achievement of efficiency in the sector, and the monitoring and enforcement of contracts in the sector” (USAID).

In that same year, the Government also created the Water Regulatory Council (CRA), “an independent regulatory agency responsible for balancing the interests of consumers with commercial principles to ensure a viable and sustainable sector under the delegated management framework” (USAID).

The Government also created the National Directorate for Water (DNA), which “has responsibility for the entire water sector. It manages most potable water sector schemes in the rural areas, as well as in smaller towns and cities” (USAID).

Water demand will soon exceed water supply in Maputo, if future use in the Umbeluzi River Basin—regulated by the Pequenos Libombos dam—grows.

### 1. Network of water distribution

According to FIPAG (Water Supply and Heritage Fund), the water distribution system, managed by Waters of the Maputo Region, covers the City of Maputo, Matola, Vila de Boane and neighbourhoods along the system.

There are approximately 82,500 household connections and 438 fountains, which are supplied from the delivery centers of Matola, Machava, Maxaquene, High Maé and Chamanculo. The System benefits 91000 consumers. According to the Ministry of Public Works, the volume of treated water produced is of approximately 4 100 000 m<sup>3</sup>/month.

In addition, there are several types/kinds of illegal water connections in Maputo.

## **Nairobi**

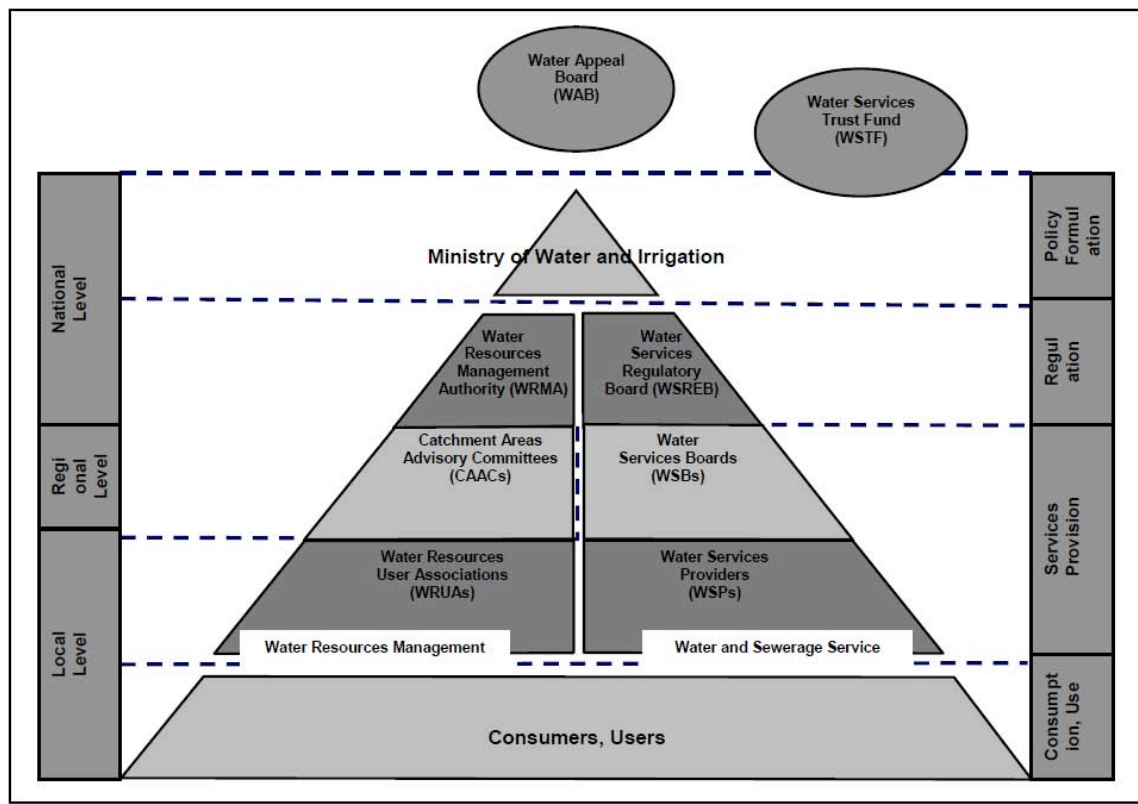


- Government of Kenya formulated a Draft National Policy for Disaster Management in Kenya in 2009 to institutionalize mechanisms for addressing disasters. Establishment of a National Disaster Management System (NADIMA)
- Responsibilities of various committees, directorates and community level disaster management under NADIMA has not yet been worked out
- No coordinated policy framework or legal basis for current disaster management system
- 72% of population in Kenya obtains water from springs and streams. (KNBS, 2009)

### Institutional Weaknesses

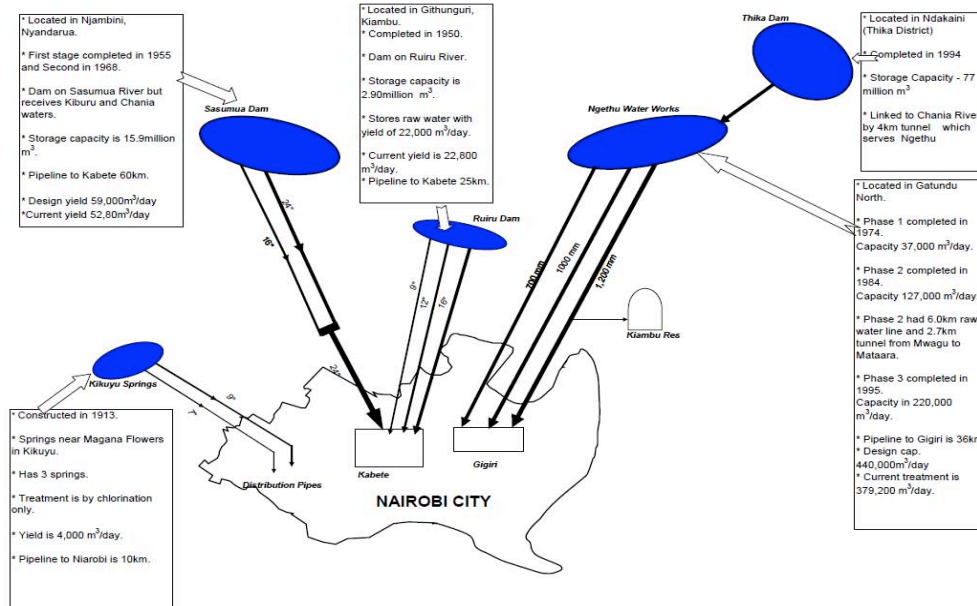
- Inadequate policy coordination in the institutional framework
- Inadequate finances, human resources and equipments
- Inadequate information and data access
- Weak disaster management capabilities within communities and institutions
- Inadequate integration and coordination

### KENYA'S INSTITUTIONAL STRUCTURE UNDER THE WATER ACT 2002



Source: MWI, 2005

### WATER SOURCES FOR NAIROBI CITY WATER AND SEWERAGE COMPANY



Source: NWSC, 2011

### WATER SITUATION IN HURUMA

- The Nairobi Water and Sewerage Company does not provide sufficient water to the people and the few residents with access to piped water are forced to go without this commodity for as long as six months.
- Previous efforts such as water kiosks have been constructed yet most of them have been reduced to idle structures due to lack of water

### WATER ACTORS IN HURUMA

- Nairobi Water and Sewerage Company
- Community Based Organizations
- Non- Governmental Organizations
- Private Water Vendors

### INTERVENTIONS IN HURUMA

- The community members mobilized themselves and made an illegal connection from the main pipe, which supplies the Kenya Air force base nearby.
- The community appointed two youth groups to guard and manage the water connection.
- This has attracted other interested parties such as the local chief and administration police regularly collect protection money.

- Civil Society Organizations are also empowering communities through advocacy and setting up water points as sustainable approaches in filling this gap.

**The Activities originally planned for the second year of our project, in our project goals and timeline, all address Objective 1 and are as follows:**

**Activity 1.1: Each local team holds a meeting in its own city to develop work plans, forge working relationships between university and NGO partners, and agree on the research instruments and processes (Project partners and facilitator).**

**PROGRESS IN THE LAST REPORTING PERIOD:** In Durban, project partners met in November 2010 to develop a work plan. More specifically, Mary Galvin of Umphilo waManzi and Lushendrie Naidu of SDCEA briefed Patrick Bond of the Centre for Civil Society on the project's Inception Meeting and discussed the goals and activities of the project. They also discussed student internships and the potential participation by UKZN students: Simphiwe Nojiyeza (overlap includes IWRM, UD sanitation; Masters students Francis N'gambi (Malawi) and Lars Gaudsal (Norway). Lastly, the group discussed uncertain elements of the project, which needed clarification (e.g. the explicit support mechanisms/funding for Umphilo and SDCEA, compensation and selection of part-time NGO research worker to handle four case studies in Durban communities), all of which have since been clarified.

**PROGRESS THIS REPORTING PERIOD:**

### **Durban**

In South Africa, representatives from Umphilo waManzi and the South Durban Community Environmental Alliance have met various times to discuss the implementation of this project. They met in mid-February to plan and organize a PAR training workshop (see report in Appendix H) with NGO representatives, activists and community members.

Professor Patrick Bond, Director the Centre for Civil Society was away on Sabbatical from September 2010 to June 2011, which has delayed the official selection of students for the local internships and exchange trips to Mozambique and/or Kenya. The NGO partners, however, did keep Prof. Bond up-to-date on the progress of the project through Skype calls and occasional meetings in person.

The team (SDCEA, Umphilo and CCS) met in early June to discuss work plans, progress, COP 17 and the meeting in August. SDCEA proposed a mini-toxic tour and Mary reiterated that it would need to address issues of water and adaptation. Patrick offered many good ideas about beach erosion, flooding, etc that they could incorporate into the tour. Umphilo proposed a visit to one of the 4 neighbourhoods where the NGO has been working in with focus on flooding, UD toilets, and rainwater harvesting or river health.

### **Maputo**

In Maputo, Justiça Ambiental and MUGEDE staff met with project team partners from Eduardo Mondlane University (UEM) on February 17, 2011 to plan for the participation and contribution of student interns, as well as to discuss the project's other objectives and activities. Six undergraduate students from the Faculty of Education have since been selected to intern at the two local NGOs. Their internships began in May 2011.

The following three students, whose level of English knowledge is such that they can benefit from the exchange opportunities, will go to Durban in April 2012:

Name	Research Proposal
Neima Issufo Adamo	Infrastructures of the Water Supply In Maputo City
Sérgio João Brito	Distribution and Price of Water In Maputo
Ester Pedro Uamba	Sanitation and Sewerage Systems In Maputo

The following three students will not go on exchange, but have and will continue to intern at JA and MuGeDe:

Name	Research Proposal
Marquezine Alves Lugela Camacho	Treatment of the Water and Purification
Francisca Salazar Caetano	Drainage systems in Maputo
Luis Oscar Armando Inroga	Geographic basin systems in Maputo

The following are their Terms of Reference:

TORs at MuGeDe:

- Plan community activities
- Organize environmental education workshops
- Prepare reports about activities carried out by MuGeDe.

TORs at JA:

- Participation in all environmental education lessons at schools
- Provide input and contribute creative ideas for didactical games, and share methodologies
- Document project activities.

On March 30, 2011, Justiça Ambiental representative Nilza Matavel met with Elias Manjate from the University to plan the curriculum for the environmental education programme, which subsequently began to be implemented by JA and UEM at local secondary schools.

## **Nairobi**

In Nairobi, Kilimanjaro Initiative and Kenya Debt Relief Network staff have met several times with University of Nairobi project advisors. Two interns, Elizabeth Wamuchiru and Stephen Otieno, were selected to work with the two local NGOs and were introduced to the team in February 2011. In March, the group met to discuss PAR training and selected possible dates and consultants.

The student internships at Kilimanjaro Initiative and KENDREN started in May 2011 and will hopefully last until the end of the project. Elizabeth and Stephen work under the direct supervision of the research assistants at Kilimanjaro Initiative and KENDREN, respectively. The students' performance and research are also closely monitored by their academic supervisors, Professor Ndegwa and Mr. Romanus Opiyo, who meet regularly with the research assistants.

The students are responsible for:

- Formulating the research agenda on water governance;
- Helping to plan and organize community workshops;
- Documenting and disseminating results from community workshops; and
- Identifying and reporting on existing community strategies and coping mechanisms

The titles of their papers are *The Role of State and Non-State Actors in Climate Change Adaptation: The Case of Flood Risk Management in Kibera Informal Settlement, Nairobi* and *Water Governance and Adaptation to Climate Change in Informal Settlements: Case of Huruma, Nairobi, Kenya*, respectively.

Also in May, the group had what they described as “a very successful” PAR training workshop, which was facilitated by *Solutions Integrated Systems*. All the partners were present, including Stephen and Elizabeth, as well as 10 community representatives from Kibera nominated by KI and 10 community participants from Huruma nominated by KENDREN.

Although minutes have not been provided for all of these meetings, e-mails explaining their outcomes are available upon request.

**Activity 1.2: Identify stakeholders working in area of study in each city (Government organizations, Civil society organizations, NGOs, collaborating universities, students and research assistants).**

**PROGRESS IN THE LAST REPORTING PERIOD:** In Durban, both partner NGOs have been active in collaborating with stakeholders in the city, including Sobonakhona Traditional Council, eMbumbulu, Amaqadi Traditional Council, eMzinyathi, Environmental Planning and Climate Protection Department Ethekwini Municipality Durban, South Africa and eThekweni Water and Sanitation. In early 2011, Simphiwe Nojiyeza, a PhD student at UKZN and casual employee at Umphilo waManzi, who

participated in the Climate Change and Sustainability Policy workshop in eThekweni with all stakeholders, will participate in water policy session to be held later this year.

In Maputo, MuGeDe organized a meeting with stakeholders, including the Ministry of Public Works, National Water Board, Waters of Mozambique, Water Supply Investment Fund (FIPAG), the Water Regulatory Council (CRA), Ministry of Health, Ministry of Planning, and the City Council. Other environmental organizations also participated, as well as Dr. Elias Manjate representing Eduardo Mondlane University. The purpose of this particular meeting was to introduce the project to community members and government officials, as well as to identify areas where the project could be implemented. According to MuGeDe, the meeting was moderately successful in establishing working relations with government officials.

In Nairobi, the team is also developing its climate change and water governance contacts in the city government and among other NGOs. The Nairobi team through Kilimanjaro Initiative (KI) invited Nairobi Water and Sewerage Company to attend their initial meeting held in Kibera, when the project was first introduced to the Kibera Community.

### **PROGRESS IN THIS REPORTING PERIOD:**

In Durban, SDCEA held various meetings, partially funded by this project, at different locations in the build up to workshops focusing on strategizing, lobbying and mobilizing on climate and water issues in preparation for the COP17 meetings in November 2011. These included meetings in Clairwood on April 6, 2011 and in Wentworth on April 13, 2011. On April 16, 2011 SDCEA hosted a COP 16 Review and COP 17 Strategic Planning Workshop (see Appendix K), which was used as a platform to bring together people from all backgrounds and communities to discuss mobilization and actions to be taken during the COP 17 negotiations to be held in November and December in Durban. Information on stakeholders, as well as the roles and capacity need of these actors is currently being gathered.

In Nairobi, the students' research projects have involved networking and identification of key stakeholders in water governance, as well as interviews and community-based research. A list of these stakeholders and a brief description of their roles is mentioned on pages 8-11 of this report. In addition, the Nairobi team through KI invited Nairobi Water and Sewerage Company in their initial meeting held in Kibera, when the project was first introduced to the Kibera Community.

In Maputo, the environmental education programme also involves networking and identification of key actors in water governance. A list of these stakeholders and a brief description of their roles is mentioned on pages 6 and 7 of this report.

**Activity 1.3: Develop an innovations platform that brings all stakeholders in each city together (Government organizations, civil society organizations, NGOs, collaborating universities, students and research assistants).**

**PROGRESS IN THE LAST REPORTING PERIOD:** As noted elsewhere in this report, each city team is developing its own approach to this activity; it is an emergent process and we are making progress.

**PROGRESS IN THIS REPORTING PERIOD:** The development of the innovations platform in each city is ongoing, via student and NGO research assistants. The methodologies we are creating for our work in each city, including community workshop design and NGO organizing techniques, represent one aspect of this innovations platform. Students and NGO research assistants are beginning to document these processes.

### **Durban**

In Durban, Umphilo waManzi held a PAR training session (see Appendices H and I) in March 2011, which included local activists from each of the four communities where it currently works. On July 5, Umphilo participated in a COP17 national civil society preparation meeting and on July 15, its staff met with representatives from eThekweni Environmental Planning and Climate Protection Division to discuss issues identified in its participatory local assessment workshops, which are project-specific activities, funded by IDRC. The specific goals of this meeting were:

- To discuss how to translate scientific information on climate change impacts to inform community adaptation strategies and,
- How Umphilo and the municipality can work together to assist communities in preparing these strategies

York University student Beth Lorimer—an intern at Umphilo waManzi at the time—also participated in this meeting and gained important understanding of the institutional framework for water governance in Durban. Ms. Lorimer learned that although many residents are raising concerns about the impacts that climate change was having in their communities (i.e. flooding from increased severity of storms), the city does recognize these concerns and is active in trying to address them. The presence of a Climate Protection Division in the municipality attests to this recognition and offers a great opportunity for this project foster an active relationship between the people of Durban and the municipal government to address climate change adaptation strategies.

On May 14, the South Durban Community Environmental Alliance held a community climate justice workshop, partially funded by this project. The theme of this workshop was *joining and strengthening people's common struggles* and its aim was to discuss how climate change is impacting the wellbeing and livelihoods of local communities. Among topics discussed was air and water pollution by oil refineries and paper and pulp mills.

On June 18, SDCEA held a climate change workshop at Ixopo Primary School. Similar workshops were held on July 2<sup>nd</sup> and 16<sup>th</sup> in New Castle and Richards Bay, respectively. During these workshops, Alex Todd—a York University graduate student who is one of

this project's exchange students—made a presentation on the impacts of climate change faced by Canadians. All of these workshops were partially funded by this project.

On June 25, SDCEA held an awareness workshop, also partially funded by this project, on climate change, at Umkomaas, which addressed some of the causes of climate change as well as its impacts on workers and communities, the environment and the economy. Three presentations were given on these issues. Lushendrie Naidu, research officer at SDCEA, explained climate change to the group, and its impacts on local communities. She also spoke about COP17 and SDCEA's plans for action at this event.

All of these project activities relate to several of our project's goals and feed into our innovations platform development and synthesis report.

### **Maputo**

In Maputo, four Eduardo Mondlane University students have been working with Justiça Ambiental, which has created interactive environmental education workshops currently underway in three local secondary schools: Escola Secundária Eduardo Mondlane, Colégio Arco-Iris, and Casa do Gaiato. These workshops take place one a week, on a monthly basis, and last approximately 45 minutes, during which time students, teachers and parents learn about climate change, pollution, and water. This is one of JA's contributions to this project's environmental education and community development objectives.

Two Eduardo Mondlane University students have been working with MuGeDe on carrying out environmental education workshops in urban underprivileged communities, and in particular with women. The students are documenting processes and results as part of their own research, which will appear in their research papers.

On April 14, MuGeDe and UEM held a community meeting in Malhangalene "B" to introduce the project to community chiefs, neighbourhood chiefs and community members. A similar introductory meeting took place at Bairro Central "C" on April 16, 2011.

On May 20, MuGeDe held its first environmental education workshop at Malhangalene "B" (report available in Portuguese). A group of local residents, mostly women and youth, attended the workshop and demonstrated great enthusiasm in being part of this initiative. As part of this workshop, participants were asked to fill out a questionnaire about water, climate change, and the environment. Most participants were unaware and/or lacked understanding of climate change and its impacts on their local community and environment.

### **Nairobi**

In Nairobi, KENDREN has held two debt clinics, on water governance. A core output of these clinics has been the formation of a loose network within the Huruma community



that is focused on issues of water access and management and is engaging the city council water directorate in this regard. They have also been able to facilitate a meeting with the local administration, the local councilor and the water services board. After the PAR Training session, which took place in May 2011, they also had a Climate Change Teach-in session in Huruma (see Appendix C).

Two University of Nairobi graduate students (Stephen Otieno and Elizabeth Wamuchiru) have completed their research in the Kibera and Huruma areas of the city as of August, and have begun writing up their papers. They will both attend the project's second annual meeting, which will take place this August. Following the meeting, these students will spend two weeks in Durban learning about climate change and water in this city, as well as community organizing and environmental education techniques.

The students' visit to Durban focuses on exchanging experiences on the characteristics of the actors involved in climate change and water governance, capacity of the actors, the nature of their collaboration, their effectiveness in spearheading the agenda of climate change in their areas of operation, which is basically urban areas hosting the poor and vulnerable members of urban community in as far as water governance is concerned.

This is considered important in achieving the CCAA project outputs in the following manner:

- Appreciating the level of awareness among civil society groups and low income persons about climate change in different countries
- Efforts of dealing with climate change challenges within target communities and civil society

In addition, they will present their research and a comparative study on the two cities in a public symposium at the University of KwaZulu Natal. York University students will also present at this event.

Reports about their experience and effectiveness of their stay will appear in the second annual report.

**Activity 1.4: Train research assistants in data collection methods related to climate change (Civil society, NGOs, collaborating universities, local government).**

**PROGRESS IN THE LAST REPORTING PERIOD:** The following research assistants had begun to work with the NGO partner organizations by the end of this reporting period:

Umphilo waManzi - Dudu Khumalo; South Durban Community Environmental Alliance - Lushendrie Naidu; Kilimanjaro Initiative - Sadique Issa; Kenyan Debt Relief Network – Kiama Kaara; MuGeDe – Fernando Pondeca; Justiça Ambiental – Erika Mendes.

A PAR trainer has been identified to work with the Durban team. We are planning

similar training sessions for the Nairobi and Maputo teams.

**PROGRESS IN THIS REPORTING PERIOD:**

Helio Divage was hired to replace Fernando Pondeca, who has been assigned other duties at MuGeDe. Nilza Matavel was hired to replace Erika Mendes, who is currently attending university in Brazil.

PAR training sessions were held in Nairobi and Durban, along with university training and supervision.

University-based training took place in Maputo, with PAR training soon to come.

The climate change data collection methods we have identified so far include community mapping, focus groups, collective story-telling, and action research. We are planning ways of sharing training in these methods within and among our country teams and in project our meetings.

**Activity 1.5: Research assistants and community groups bio-map climate change vulnerability in each city (Civil society, NGOs, collaborating universities, students and research assistants).**

**PROGRESS IN THE LAST REPORTING PERIOD:** Umphilo waManzi has organized an initial mapping workshop for March 2011. The other partner in Durban, SDCEA, is also planning mapping activities related to climate change and water for the coming months.

**PROGRESS THIS REPORTING PERIOD:** This activity is ongoing, via the work of students and NGO research assistants.

In Durban, Umphilo waManzi has held several participatory local assessment workshops on water resources and climate change in low-income neighbourhoods. The assessment process consists of four exercises.

First, participants create a spatial map illustrating the location of resources in the community in relation to water and community development.

Second, a timeline of significant events in the community is created with a particular focus on issues of flooding, drought, storms, etc. over the last 30 years. Third, a time trend is created to represent how the significant events identified in the timeline, such as flooding and drought have impacted the community in terms of housing, land quality, water quality, river health, food security, etc.

Finally, participants create a Venn diagram to illustrate the sociopolitical environment in the community, illustrating relationships between community services, government agencies, and traditional councils. The Venn diagram helps the community identify whom they can approach with their concerns and which services they can access to help

them adapt. For example, in Umbumbulu, a community where Umphilo works, community members expressed interest in working with agricultural extension officers from the provincial Department of Agriculture, Environmental Affairs, and Rural Development to learn about drought resistant crops.

The maps and charts, produced by community members will serve as a framework to identify climate vulnerabilities and strengths and weaknesses with regards to water services, availability and quality. The focus of the workshops is to value the indigenous knowledge within these communities and document their experiences.

In Nairobi, student researchers, Elizabeth Wamuchiru and Stephen Otieno used spatial maps of the two communities, Haruma and Kibera, to identify water resources and climate change vulnerabilities in their own research. These maps identify where the greatest needs for intervention are and were included in their research presentations to the project team at the second annual meeting in August 2011. Photographs of problem areas in the neighbourhoods (i.e. where flooding or pollution occurs) supplement the spatial element. By taking photographs, the researchers were able to interact with local residents and listen to their challenges and experiences. These stories and visual elements of the neighbourhoods were also relayed to the project team at the second annual meeting.

**Activity 1.6: Facilitate collective story telling about the lives of those in the area of study (Civil society, NGOs, collaborating universities, students and research assistants).**

**PROGRESS IN THE LAST REPORTING PERIOD:** Umphilo is taking the lead in developing its methodology of a “learning journey” between communities, as they go through the above mentioned participatory local assessment workshops on water resources and climate change.

At the Second Annual Meeting in Durban, residents from the four different communities that Umphilo waManzi works with were invited to a meeting with the project team in Umzinyathi. This meeting provided an opportunity for members from different communities to interact and share their similar experiences. This activity was one way that the idea of a learning journey is being promoted.

At COP17, Umphilo waManzi plans to repeat a similar exercise between the communities with added participants from COP17 delegations and civil society.

**PROGRESS THIS REPORTING PERIOD:** In Durban, Umphilo waManzi has continued its “community learning journey” planning. Discussions on how to incorporate bio-mapping in community workshops are also underway in the other cities.

**Activity 1.7: Document current water governance structures (Collaborating universities, research assistants and students).**

**PROGRESS IN THE LAST REPORTING PERIOD: Initial characterization of**

**the existing water governance structures and challenges in each city, prepared by project team members, was shared at our initial team meeting in August, 2010. Documenting these realities is a key goal for the university students' internships, in collaboration with the NGO partners in each city.**

**PROGRESS THIS REPORTING PERIOD: This is ongoing, in the work of the students and NGO research assistants.**

**PROGRESS THIS REPORTING PERIOD:**

Students and academic partners have almost completed the synthesis report, which outlines the water governance structures in each of the three cities. This report will comment on the legislative environment for water resources in each country and speak specifically to how each of the three cities manages and delivers water for its residents. A summary for each country is provided in pages 6-11 of this report.

The initial insight from this process has highlighted that each country, let alone the cities, faces challenges in water governance but there is also the presence of opportunity. At the Second Annual Meeting, one of the main issues raised by the Mozambican partners was the difference in governance between Maputo and the other two cities. In Durban and Nairobi, the water service authorities are not without their problems, but are relatively responsive to the needs of residents and present in the communities. In Durban, the presence of a Climate Protection Division within the municipality and a standing relationship between the city and the University of KwaZulu Natal researchers is a boon for climate change adaptation efforts.

However, the relationship in Maputo between government and civil society is not as constructive.

**Activity 1.8: Conduct participatory research with civil society, NGOs and local organization on water security (Civil society, NGOs, University, students).**

**PROGRESS IN THE LAST REPORTING PERIOD:** The project's design, in working with partner NGOs, is participatory and our initial team meeting was a model of participatory project governance. Community meetings and participatory research activities are getting underway in all project areas, with defining "water security" an important focus.

**PROGRESS THIS REPORTING PERIOD:** The student researchers and NGO research assistants continue to use participatory methodologies throughout their work.

Project partners are using community-based approaches, such as the use of participatory local assessment in Durban and the use of community meetings, to conduct participatory research. Over the course of the project, community members have been asked by student research and research assistant to raise the issues, which affect their communities the most and are using these issues to set the agenda for advocacy and strategic planning.

At the Second Annual Meeting in August, all project team members participated in PAR-review session with Patrick Mbanjwa in Durban. This session allowed research assistants, NGOs and students to share their participatory methods with others and discuss critically how these methods are effective or how they can be approved. Minutes from this session detail some of the strategies that NGO partners use for participatory research, such as addressing power dynamics in community meetings.

Project teams in each of the three cities continue to define their own areas of intervention for the project and create their own work plans and agendas to respond to project outcomes.

**Activity 1.9: Collect gender disaggregated data on climate change vulnerabilities (Civil society, NGOs, collaborating universities, local government).**

**PROGRESS IN THE LAST REPORTING PERIOD:** We have begun to collect this information in conjunction with community meetings and workshops.

**PROGRESS THIS REPORTING PERIOD:** In the students' and NGO research assistants' ongoing work, in all three cities, we are documenting gender disaggregated data on climate change vulnerabilities and workshop participation. This information will feed into the students' research papers and reports.

**Activity 1.10: Conduct SWOT analysis (University faculty, research assistants and students).**

**PROGRESS:** This is being planned for our annual team meeting, if time allows.

**Activity 1.11: Conduct interviews with local government officials and leaders on water governance structures (University faculty, students and research assistants).**

**PROGRESS IN THE PREVIOUS REPORTING PERIOD:** As noted, NGO partners in all three cities have begun to meet with government officials and traditional leaders regarding climate change and water governance.

**PROGRESS THIS REPORTING PERIOD: This activity is ongoing, via students' and NGO research assistants' work in local communities.**

**June 24, 2011** - Umphilo waManzi met with Climate Modeling Researchers at the University of KwaZulu Natal. This meeting began the discussion on how climate change science can be translated at the community level.

**July 15** - Umphilo waManzi meets with representative from Environmental Planning and Climate Protection Department of eThekweni Municipality. This meeting allowed Umphilo waManzi to learn about the municipality's climate change adaptation programs.

**August 2011** – Student researcher, Beth Lorimer, attended a Catchment Management Forum for the Lower Umgeni in Durban, and had follow meetings with representatives from DWEA and local conservancies. These meetings greatly informed outlining the water governance structures for Durban.

**Activity 1.12: Train research assistants on data analysis techniques, using data collected by each group in each of the three cities (Civil society, NGOs, collaborating universities, local government).**

**PROGRESS THIS REPORTING PERIOD:** PAR training has and will include data analysis skills development. Training in data analysis techniques is ongoing via university supervision, PAR skills development, project networking, and faculty research. For example, MamaDudu Khumalo, research assistant at Umphilo waManzi in Durban, was trained in the analyzing the data received from participatory local assessment workshops. Mama Khumalo conducted the participatory assessment workshops with the assistance of Simphiwe Nojiyeza. The maps and charts created from these workshops were interpreted to identify the main issues facing the communities.

**Activity 1.13: Data analysis by research assistants. During data analysis the research assistants should identify the following:**

- **Level of existing knowledge on climate change among low-income groups in the study area**
- **Level of awareness among civil society groups and low-income persons about climate change**
- **Efforts of dealing with climate change challenges within target communities and civil society**
- **The scope for improved response and adaptation to climate change in study area**
- **Constraints and limitations experienced by target community groups**
- **Training needs for civil society and community groups**
- **The strengths of partner organization in climate change adaptations.**

**PROGRESS IN THE PREVIOUS REPORTING PERIOD:** none yet.

**PROGRESS THIS REPORTING PERIOD:** Data analysis is ongoing in the work of the students and NGO research assistants. In Nairobi, two students (Stephen Otieno and Elizabeth Wamuchiru) have completed their research in the Kibera and Huruma areas of the city as of August, and have begun writing up their papers. Two York University students (Elizabeth Lorimer and Alex Todd) completed research in May and wrote papers on climate change and vulnerability among marginalized populations in Toronto, prior to starting their research trips to Durban (Alex Todd, “Climate Change and Water Governance in the Greater Toronto Area;” Elizabeth Lorimer, “A History of the Green Change Project”).

The Maputo students have also begun this phase of their work.

#### **Activity 1.14: Report writing (project team).**

**PROGRESS IN THE PREVIOUS REPORTING PERIOD:** This report, as well as our First Technical Report on the first six months of the project's work, and the Inception Meeting Report, have been prepared and submitted.

**PROGRESS THIS REPORTING PERIOD:** The project team has continued to complete and submit regular reports for IDRC as expected. To date, we've submitted the following reports:

- Inception report submitted 6 months after Commencement Date
- Inception Meeting report submitted on January 31, 2011
- First technical report covering the first 12 months of Research Work submitted in February 2011
- First financial report covering the first 12 months of Research Work submitted in March 2011
- Second Interim Report submitted on August 2011
- Communications plan submitted September 2011
- Monitoring & Evaluation plan submitted September 2011
- Second Annual Meeting report submitted on November 2011

The information in these reports, and the project's goals and methodology, has also served as the basis for several conference presentations and forthcoming publications by project partners and students, including the following:

“Women and Water Management in Times of Climate Change: Positive Processes” by Patricia Figueiredo and Patricia E. Perkins, Faculty of Environmental Studies, York University. Abstract approved and paper submitted to the Journal of Cleaner Production special issue on “Women, Water, Waste, Wisdom and Wealth,” May 16, 2011.

“Gender Justice and Climate Justice: Community-based strategies to increase women's political agency in watershed management in times of climate change” by Patricia Figueiredo and Patricia E. Perkins, York University. Paper presented at the Ninth International Conference of the International Development Ethics Association (IDEA) on “GENDER JUSTICE AND DEVELOPMENT: LOCAL AND GLOBAL” Bryn Mawr College, Pennsylvania, June 9-11, 2011.

“Innovations in participatory water governance in times of climate change” by Patricia E. Perkins, Ana Tavares Leary, Alexander Todd, Elizabeth Lorimer, and Patricia Figueiredo, York University. Paper submitted to Natural Resources Forum for a special issue on Institutions for Sustainable Development, 15 July 2011. This paper was not accepted by the journal, but we will revise it and seek other publication venues.

“Politics of Climate Justice: Paralysis Above, Movement Below” by Patrick Bond, University of KwaZulu Natal. Paper presented to the Gyeongsang University Institute of

Social Science, Jinju, Korea, 27 May 2011.

“The Right to the City and the Eco-Social Commoning of Water: Discursive and Political Lessons from South Africa” by Patrick Bond, University of KwaZulu Natal. Forthcoming in Farhana Saltana and Alex Loftus (eds), *The Right to Water*, London, Earthscan, 2011.

“Political-ecological and political-economic conflicts over water management in Durban, South Africa” by Patrick Bond, University of KwaZulu Natal. Unpublished paper.

“Climate Change and Water Governance in the Greater Toronto Area” by Alex Todd, York University. Unpublished paper.

“A History of the Green Change Project” by Elizabeth Lorimer, York University. Unpublished paper.

Activity 1.15: Project team meets to document lessons learnt and to develop next steps (York University, Collaborating universities and facilitator, NGO partners – year 2).

**PROGRESS IN THE PREVIOUS REPORTING PERIOD:** One main goal of our periodic meetings by telephone and Skype is to discuss developments and strategize about next steps for the project in each city and within each NGO. We have held conversations with each partner NGO in early 2011.

**PROGRESS THIS REPORTING PERIOD:** Team members continue to meet regularly by Skype and in person in each city. Our annual team meeting in August 2011 provides an opportunity to visit sites of community engagement in Durban and Maputo, as well as share results, do joint PAR training, and plan next steps. Please see IDRC Project 106002-001, Report 2011A6 [Last Revised Nov 2011].

**Activity 1.16: Develop policy recommendation and intervention plans (Government officials, local government officers, NGOs, civil society and collaborating universities – year 2).**

**PROGRESS THIS REPORTING PERIOD:** The community-based workshops and organizing methods which each team is developing represent intervention strategies to increase the participation of marginalized local communities in water governance from a position of climate change awareness. These are beginning to generate policy recommendations, especially in relation to the COP17 meetings and the work of the Durban team. For example, the municipality of eThekweni (Durban) has emphasized community awareness, resilience and involvement in its documents describing the municipality’s climate change adaptation strategies, prepared in advance of COP17 in Durban. At the August 23, 2011 launch of the document *Towards a Low-Carbon City: Focus on Durban* by the Academy of Sciences of South Africa, which was commissioned by the municipality, Dr. Debra Roberts, head of the Environmental Management Department, recognized comments and interventions by two of our project partners, SDCEA and CCS.



**Activity 1.17: Hold a workshop for government officials and policy makers in the urban water sector in each city (Facilitator and University faculty, NGO partners -- year 2).**

**PROGRESS THIS REPORTING PERIOD:** Government officials and policy makers have attended project-organized meetings in Durban, as noted above. The meetings' objectives – to bring government officials into contact with community organizations for mutual recognition and awareness, sharing of situated knowledge related to climate change, and building comfort levels for future contacts and policy development, were in general accomplished. This activity is in the planning stages in Nairobi and Maputo.

**Activity 1.18:** Community feedback workshops (NGO partners – year 2).

**PROGRESS THIS REPORTING PERIOD: Community participants provide feedback at nearly all project meetings; organized workshops for this purpose are being planned in all three cities.**

**Objective 2:** To identify and test viable alternatives for enhancing civil society roles towards adaptation to climate change and variability by vulnerable groups.

***Outcome 2:** Civil society organizations use identified or developed interventions to help vulnerable groups cope with climate change and variability.*

Milestone/outcome indicator 2.1: Best practices (interventions) to cope with climate change and variability collectively identified/developed together with stakeholders.

Milestone/outcome indicator 2.2: Number of civil society organizations trained and using best practices to cope with climate change and variability.

**PROGRESS THIS REPORTING PERIOD:** Each country team is developing a different focus for its intervention methods, grounded in the experience and special expertise of partner NGOs as they work with community partners to expand their work into climate change adaptation and readiness. In Nairobi, the focus is on youth leadership development in the construction of sports fields and public space in flood-prone areas, and on climate debt awareness and activism at the community level. In Maputo, the team is emphasizing environmental and climate workshops and curriculum development for local schools, involving young people, parents and teachers, as well as community workshops with women. In Durban, partners are focusing on equity and conservation issues surrounding urine diversion toilets, urban pollution, water access, and organizing at the local and international policy level in preparation for the Durban COP17 meetings in late 2011. Our project allows these initiatives to be evaluated and improved through PAR activities including community meetings, feedback to the NGOs, networking with government officials and academic partners, and ongoing research on community needs and vulnerabilities.

**Activity 2.1:** Based on the baseline results identify/develop interventions for coping with climate change and variability (Collaborating university faculty, York University, civil society, NGOs – year 2).

**PROGRESS THIS REPORTING PERIOD:** All three country teams are well into their intervention strategy development, working with their local community constituencies and partners. In general, the major vulnerabilities relate to the weaknesses in civil society systems to effectively participate in climate-sensitive water governance.

In Nairobi, because of the primacy of Nairobi Dam and Nairobi River in local water and environmental awareness, the project's interventions are centering on areas downstream from Nairobi Dam and ways of addressing house flooding during extreme weather events, while developing youth leadership. Project partners' community connections in Humera and Kibera are also serving as the basis for educational programs on climate debt.

In Maputo, water problems related to infrastructure shortages and frailty take precedence so far over weather-related issues, so project interventions are focusing on youth and women's environmental education for general civic literacy. Project partner organizations are developing ways to support Maputo city CSOs to better influence city planning in a way that will help to reduce flooding in the city. The organizations' vulnerabilities include many demands, little funding and time, limited staff qualifications/experience, crosscutting political pressures, and limited experience with climate change education and organizing methods. Our project is helping by fostering exchanges of information on how to do this work, participatory program development and education, support from local academics, and political emphasis on the importance of climate justice.

In Durban, also, civic literacy and organizing are a prime focus, while more pressing water shortages there have brought project partners to emphasize water conservation measures along with climate justice advocacy.

**Activity 2.2:** Develop training and awareness enhancing programmes for civil society organizations and NGOs (Students and university faculty and civil society, NGOs – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** The programs are well underway in all three cities (see reports in Appendices).

**Activity 2.3:** Develop methods and procedures for incorporating equity and gender issues in climate change interventions (Civil society, NGOs, collaborating universities, local government– year 2).

**PROGRESS THIS REPORTING PERIOD:** All teams are working on gender / equity content and approaches. Our annual meeting also includes attention to this.

**Activity 2.4:** Iteratively seek to improve our training and awareness enhancing programmes in workshops with civil society organizations, community groups, and NGOs.

**PROGRESS THIS REPORTING PERIOD:** This is beginning to happen, as partners repeat and modify their workshops, adding and changing the content for different groups and to improve its relevance and interest.

**Activity 2.5:** Implement progressive water governance to mitigate insecurities of vulnerable groups by civil society organizations and NGOs (Civil society, collaborating universities, NGOs and students – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet.

**Activity 2.6:** Civil society, NGOs and students develop, implement and revise community workshop techniques on water governance issues (Civil society, NGOs, collaborating universities, local government – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** This is ongoing in all three cities.

**Activity 2.7:** Civil society and NGOs monitor and evaluate water governance frameworks in each city (Civil society, NGOs, collaborating universities, local government – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Critical evaluation of water governance frameworks is taking place in Nairobi (e.g. KENDREN’s climate debt clinics and teach-ins) and in Durban (SDCEA’s workshops preparing for COP). In Maputo, this is emergent.

**Activity 2.8:** Involve local government officials in reviewing water governance structures (Local government officials and university faculty, NGOs – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Local government officials have attended a wide range of project workshops, especially in Durban. Their involvement in reviewing water governance structures is beginning in all three cities. The “synthesis report” which a working group of project team members is now finalizing, which summarizes the state of water governance in each city in relation to climate change and local vulnerabilities, includes a SWOT analysis related to water governance interventions.

**Activity 2.9:** Document local ecological and political knowledge of vulnerable groups (Civil society, NGOs, collaborating universities – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet, although the students' research is leading towards both documentation of local knowledge and involvement of government officials via presentations of student research work.

**Activity 2.10:** Assess emerging additional techniques for engaging vulnerable groups (Civil society, collaborating universities, project team, NGOs – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet; This will be part of our Monitoring and Evaluation activities, meetings in year 3, and final meeting agenda.

**Activity 2.11:** Document and report process results (Project team, civil society and collaborating universities, NGOs – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Team reports and project reporting are accomplishing this, along with project publications.

**Activity 2.12:** Assess emergence of policy suggestions to improve local climate change adaptation (Local government officials, policy makers, civil society, NGOs and collaborating universities – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet.

**Activity 2.13:** Project team meeting to compare city-by-city results, processes, challenges and ideas, and develop next steps (Project team – year 2).

**PROGRESS THIS REPORTING PERIOD:** Our annual meeting in Durban and Maputo (August 2011) carries out this activity.

**Activity 2.14:** Conduct PRA to involve local participants in research design and in assessing outcomes (Facilitator, collaborating universities, NGO partners – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet – This will be part of our Monitoring and Evaluation process.

**Objective 3:** To share widely the knowledge generated for adoption by other cities in Africa.

**Outcome 3:** *Lessons learnt from the study cities are being used in other cities within the three countries and other African countries (up-scaling and out-scaling of project results).*

Milestone/outcome indicator 3.1: Project results disseminated widely in other African cities

Milestone/outcome indicator 3.2: Thesis reports from participating students

Milestone/outcome indicator 3.3: Journal articles and policy briefs

Milestone/outcome indicator 3.4: Workshop reports.

**PROGRESS THIS REPORTING PERIOD:** Project and team members' publications and our website (<http://ccaa.iris.yorku.ca>) are accomplishing this activity. Through Skype calls, email interaction, the project website, publications, and our project meetings, the successes and ideas of all teams are being shared among the partners, as well as more widely. Students are starting to complete their research work and write up their results, as noted above. Partners are beginning to publish papers related to project work.

**Activity 3.1:** Establish links between civil society groups, NGOs and local government (Civil society, NGOs, collaborating universities, local government – year 2).

**PROGRESS THIS REPORTING PERIOD:** These connections are being established through project workshops and meetings, which include government officials, in all three cities.

**Activity 3.2:** Build the capacities and confidence of civil society groups in project areas on how to carry out activities related to climate change on their own (Civil society, NGOs, collaborating universities, local government – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Confidence-building is a goal and outcome of all project workshops.

**Activity 3.3:** Train civil society groups and NGOs on monitoring and evaluation procedures (Facilitator, collaborating universities, NGOs –years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Our Monitoring and Evaluation process will include this training. We are waiting for further guidance and instructions from IDRC on expectations and timelines for our M&E plans.

**Activity 3.4:** Establish networks with other civil society groups and NGOs working in other parts of the country and with other international groups working on climate change ((expand the membership of the innovations platform) Civil society, NGOs, collaborating universities, local government – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Networks with other groups doing climate justice education and organizing are emerging in all three countries and also internationally. We are developing a list / directory of these related organizations.

**Activity 3.5:** Academic, civil society and NGO partners develop joint statements of research challenges, processes and results (Civil society, NGOs, collaborating universities – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet, although these statements are beginning to emerge through team meetings and students' and NGO research assistants' work.

**Activity 3.6:** Project team meets to develop joint reports on project outcomes (Project team, year 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet – year 3.

**Activity 3.7:** Disseminate project results online and at international conferences (Project team, collaborating universities, civil society, NGOs –year 3).

**PROGRESS THIS REPORTING PERIOD:** This is already beginning – see Appendix.

**Activity 3.8:** Project partners expand partner networks and plan next steps (project team – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** All teams are continually expanding their networks.

**Activity 3.9:** Full project team develops and revises collaborative report (Project team – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet.

**Activity 3.10:** Partners collaborate on publications, web dissemination of lessons learnt and participation in conferences (Civil society, NGOs, collaborating universities – years 2 and 3)

**PROGRESS THIS REPORTING PERIOD:** This is happening, first via our joint book manuscript on climate change challenges and our project's approach, and also through student collaborative work.

**Activity 3.11:** Partners expand research networks (Partners – years 2 and 3).

**PROGRESS THIS REPORTING PERIOD:** As noted, this is already happening.

**Activity 3.12:** Technical/financial report prepared (Project team – year 3).

**PROGRESS THIS REPORTING PERIOD:** Not yet.

*Summary of research findings*

*Overall contribution to knowledge from a scientific and policy perspective:*

By summarizing what is known about climate change and water management challenges in Durban, Maputo and Nairobi, from both academic and community perspectives, this project's website and initial publications are contributing to scientific knowledge of climate change and its impacts. The project provides a venue for sharing this understanding.

The project's contributions regarding successful methods of engaging with vulnerable communities, and its dissemination of these methods in academic circles and beyond the academy, are already emerging.

The project's policy contributions lie initially in its assembly of relevant information on climate change and water governance priorities, for use by governments in policy-making. The project is also bringing together vulnerable populations, represented by community organizations and NGOs, with university partners and concerned traditional and elected leaders, to address the most pressing climate change challenges in each city. It is thus facilitating progressive democratic governance and policy development.

#### **4. Project Implementation and Management**

During this reporting period, partners in Durban and Nairobi organized participatory action research (PAR) training sessions, which were attended by staff, students and communities members (see Appendix). Similar sessions are currently being planned in Maputo and are due to take place in the next reporting period. Also during this reporting period, the project underwent a few personnel changes. Justiça Ambiental (JA!) hired Nilza Matavel to replace Erika Mendes, as research assistant, and MuGeDe hired Hélio Divage to replace Fernando Pondeca.

York University *workstudy* student, Wen Ma, who was previously in charge of building the project website suddenly resigned and has been replaced by Shawn Lennie, a professional web designer. Delays in student completion of web design assignments have led to delays. But, we are confident in the new designer's ability to complete the website in the very near future.

Project-related community workshops have taken place in all three countries and reports for these activities can be found in the Appendix.

In June 2011, Elizabeth Lorimer and Alex Todd, two York University graduate students, went to Durban, where they are currently interning at Umphilo waManzi and the South Durban Community Environmental Alliance, respectively. Prior to going on these exchange trips, both students prepared papers on equity aspects of climate and water in Toronto. In addition, Elizabeth and Alex have blogged on their experiences in South Africa, as well as the impacts of climate change in this country—their blogs can now be found on the project's website!

During this reporting period, we have come to realize that not all African university schedules allow for 4 to 5-month student internships without prejudicing the students themselves by delaying the completion of their academic programs. Therefore, we are modifying our expectations for the student exchange trips, in accordance with the recommendations of academic team members. At the University of Nairobi, for example, the students have conducted field research in Nairobi and will undertake short field visits to Durban to present their Nairobi work and learn about comparable situations in Durban.

The Mozambican students, on the other hand, will be able to carry out three-month exchange trips from April to June 2012, since the Mozambican Environmental Education program includes a three-month “estágio” period and our project’s students will be do their “estágios” in Durban. We expect to be flexible with the UKZN students, accordingly.

As mentioned in the Inception Meeting Report and First Technical Report, we have proposed modifications to the project budget, which will strengthen the ability of our NGO partners to carry out their community engagement and workshop development activities. We have continued to comply with expectations regarding budget revisions and correspond with IDRC staff in order to update the budget. Our latest revised budget was submitted to IDRC in June 2011.

### **Administration by Research Organization**

We continue to face bureaucracy at York University, but have learned to work within these constraints. The research project coordinator is now fully trained on York’s procedures.

It is important to note that York’s rules and regulations do not allow funds to be advanced to individuals or vendors prior to the delivery of a service. Therefore, can only pay each project advisor at the end of each semester despite the fact that they are working all along and the project is obligated to pay them. While this was a difficulty at the beginning of the project, the project advisors have been gracious and they are now receiving their stipends along with the other project team members.

## **5. Project Outputs and Dissemination**

Information sharing and dissemination:

During this reporting period, a collection of essays written by project partners and presented at the project’s Inception Meeting, which took place in August 2010, is nearly ready for publication. Partners have worked in collaboration with Patricia Perkins and Patricia Figueiredo in editing the chapters, which are planned for publication in the latter half of 2011.



We continue to generate content for the project website, as well as photos, captions, student reports, a full bibliography and other information.

Papers and conference/media presentations related to our project, which have appeared since February 2011 include those listed on pages 23-24 of this report.

Knowledge creation:

Our team continues to develop and employ innovative methods for conducting community workshops to get local populations confidently involved in democratic water governance and climate change awareness and adaptation. The country reports in the Appendix contain a number of examples from this reporting period.

Training:

As noted above, six Eduardo Mondlane University students are now engaged in internships with Maputo NGOs, where they are being introduced to practical community organizing and environmental education work. Three of these students are preparing for their exchange visits to Durban next year. Likewise, two University of Nairobi students are doing internships in Nairobi and participating in exchange visits to Durban in August 2011. Two York University students have completed climate justice research work in Toronto and are now engaged in research exchange visits to Durban. Ana Tavares Leary, another York University student, is preparing to travel to Maputo next year.

## **6. Capacity-building:**

Please see Appendix for reports on PAR training in Nairobi and Durban.

## **7. Impact**

It is still early to expect our project's reach and impact to be documentable. One of the issues we have been discussing in project team meetings, electronically and in person, is the difficulty all teams face in integrating climate change awareness and action into the priorities and initiatives of participatory community organizations whose top priorities are set according to the very challenging basic needs of community members. This is the crux of our project, and we expect to be able to give some stories about how we are accomplishing this soon.

## **8. Recommendations**

We have no recommendations at this time.

## APPENDIX A

### **A Participatory Action Research Workshop Report on; Strengthening the role of civil society in water sector governance towards climate change adaptation in African cities**

*Facilitated by: Solutions Integrated Systems  
-17 TH May 2011-*

*Venue: SAVELBERG RETREAT CENTRE, NAIROBI, KENYA.*

#### Participants Representation

- \*University Of Nairobi
- \*KENDREN
- \*Kilimanjaro Initiative
- \*Huruma Community Members representatives
- \*Kibera Community Members representatives

The workshop began with a word of prayer from one of the participants. All participants introduced themselves and thereafter, the Co-coordinator KENDREN, Ms. Wahu Kaara welcomed all with an opening remarks about the workshop. A representative from Kilimanjaro Initiative and University of Nairobi also welcomed the participants with an introduction of the role of Nairobi Partners in the project and importance of involving Urban Community and Non-state Actors in understanding the dynamics of Climate Change Adaptation.

#### Program Background and Progress made to date

The workshop opened up through a presentation of the programme background to all the participants and self-introduction by all the participants. This laid the foundation of the proceedings. In the presentation the discussions focused on the following:

- Climate change vulnerabilities as a growing global concern;
- The project partners – a joint initiative in response to the climate change vulnerabilities and water governance in urban centers between York University and various implementing partners in Nairobi, Maputo and Durban;
- The Kenya chapter is implemented jointly with - KENDREN, Kilimanjaro Initiative and the University of Nairobi
- The project is implemented jointly with Community and other Non-State Actors in Huruma-Mathare and Kibera areas of Nairobi

## Project Approach

- The project will network various stakeholders and disseminate all information relevant to climate change vulnerabilities and water governance programming and advocacy,
- The project acknowledges the importance of Community driven initiatives and knowledge (Critical in PAR as it advocates for “Pedagogy of the Oppressed” and this will be important in understanding Climate Change vulnerability and Adaptation, as opposed to purely scientific research processes.
- The project will include Capacity building focusing on training of key stakeholders on mapping key vulnerabilities and coping mechanisms and,
- The project is committed to accountability and use of data for decision making by ensuring that an efficient monitoring and Evaluation system is put in place from which data will be generated for dissemination and use.
- The project gives a unique platform for the interaction of the Community, Non State Actors and Academia in understanding and addressing a complex urban problem

## Group Work

The participants were divided into 3 groups to discuss the thematic areas with an objective of reaching on the following key deliverables;

- 1) Arrive at a Situational analysis of key water governance and climate change variability and resulting vulnerabilities
- 2) Gather factual information for programming and development of tools for data collection based on upcoming issues

## Key Questions for Stakeholders

Thematic	What is the status at present, at various levels? City level, District, residential areas?	What has worked well in this area? Discuss and list best practices? From your level, university, city and local communities?	What are the key challenges faced at your level in this area?	Are there best practices examples that could be adopted for scale up or application context?	What you're recommendations
Water Governance structures and other issues	What is the status at present, at various levels? City level, District, residential areas		-		
Water security			-		-
Coping mechanisms and mitigation					-

### Plenary presentations

#### Group 1

#### 1) WATER GOVERNANCE STRUCTURES

#### Status (Structure)

- Limited access
- Quality
- Equality

- Gender –women are the most vulnerable
- Politics

#### Governance Structure status of stakeholders

- Nairobi City Council
- Nairobi water and Sewerage Company
- Private companies
- Government
- Greedy individuals

#### Security Status

- Individuals own water points who sell it to Wananchi
- Water rationing
- Water Channeled to selected areas
- Price of water not affordable

#### COPING MECHANISMS

- Hold the government accountable
- Join hands (all informal settlements) and have one voice of claiming for water rights
- Education by the NGO's and involvement of the communities
- The Wananchi have decided to disconnect water and govern it themselves

#### KEY CHALLENGES

- Incomplete projects eg toilets without water
- Land tenure not addressed
- Politics
- Bribery

#### Best examples that can be adopted

- Community involvement in partnership with CBOs and donors
- Water security should be left to the locals without involving private companies
- Coordination
- Educate the locals

#### Other coping mechanisms

- Storage tanks
- Befriending water vendors

#### RECOMMENDATIONS

### *On Water Governance*

- Give the locals authority to manage water

### *Security*

- Water is a basic need and everyone has a right to access it
- Communities should join hands and demand clean water for all and seek solutions to the problem
- Ensure Storage tanks are filled with water

## GROUP 2

### Status of Water Governance Structures

- Form application to Nairobi water is formal
- Charges vary in terms of group or individual application and purpose of the water.
- Survey fee (Approximately Kenya shillings 5000)
- Meter charges
- Duration of water connection varies(uwezowakowa “kupaka” mafuta)
- There has been water rationing since 2007 due to inadequate water supply from key water dams(Water rationing has been 2-days in a week)
- Estimation of water bills (No meter reading by Nairobi water)
- Use of local leaders to get efficient water connections eg councilors, Member of Parliaments (MPs) etc
- Illegal connection with sufficient water supply but none in illegal connections

### What has worked well in your area?

- Presence (Decentralization) of water services/offices (Huruma case)
- Civil society engagement(Kibera Case)
- Creation of social political space in partnership with civil society
- Oiling the hands of Nairobi water officials for the water connection

### Best examples that can be adopted

- Formation of peoples movement (Vugu-vugu ya Jamii)
- Discourage bribery (Kupaka mafuta) and know your rights
- Use of legal channels to get water(discourage illegal water connections)
- Ensuring that the leaders we choose are of high level integrity

## KEY CHALLENGES

- Delays in water connection
- Water rationing

- Estimates for water bills rather than actual reading
- The cost of water relatively high to the locals
- The piping system is poor – water contamination
- Lack of expertise among locals to take up the task of water services

Best examples that can be adopted

- Groups coming together in order to “put pressure” on those in authority

Water security

Status;

- There is rationing/inadequate water
- Compromised sanitation hence unclean water

What has worked well?

- Community movements follow legal channels
- Consistent follow-ups
- Use of community movements to apply for water connections

Coping mechanisms and mitigation

- Using illegal channels to get water; solution is formation of groups

RECOMMENDATIONS

- Offer trainings to locals on water management
- Formation of community groups and movements to enhance easy access to water
- Following proper channels to get water connections

Group 3

- Water is only for the rich and those who can afford water pumps. They link with government officials
- Water governance and possession is based on tribes
- Difference in levels of water distribution
- Privatization of water companies
- Water facilities have become useless because there is no water supply
- Lack of creating awareness/delivering information on the changes of water supply bodies
- Improper allocation of resources eg digging of boreholes and streams which endangers the lives of people living in that community, loss of wealth e,g death of cattle

### *Water security*

- Poor due to unplanned piping of water and tanks hence break of diseases
- Low quality pumping material
- The water suppliers in the slums are careless on the health of the residents since they are after money (uncovered water tanks and wrapping of the water pipes)

### COPING MECAHINSIMS

- Use of water treatment methods e.g. aqua guard
- Boiling water before use
- Using available resources in treatment of water

### What has worked well in this area?

- Treatment of water using solar
- Construction of boreholes
- Rainwater harvesting

### KEY CHALLENGES

- Lack of awareness (Management board)
- Corruption amongst the management
- Poor management
- Tribalism in water services
- Variation in water prices
- Availability of water

### Best examples that can be adopted

- Adopting other world systems that have worked eg in Brazil, the community should take charge of its water supply in the country
- Proper utility of water available through recycling
- Construction of water catchment areas

### RECOMMENDATIONS

- Location of storage tanks that will supply adequate water to the community
- Avoid individual water services and adopt communal water services
- Encourage water harvesting
- Embark on water treatment methods at the water points

### SUMMARY FROM THE GROUPS AND WAY FORWARD



- Take/Advocate for people driven response to climate change and related water governance issues
- Demystify/demonstrate/simplify climate change and water governance issues to the community context to enhance participation
- Enhance the capacity of communities by providing the means, knowledge and empowerment to address water access, availability and affordability in response to climate change variability
- Facilitate the community to organize, mobilize and take leadership to water governance issues and climate change adaptation
- Enhance the ownership and participation of community (Kenyans) on water governance and climate change adaptability.

**APPENDIX B**  
**CCAA 1st QUARTER 2011 REPORT**  
**Prepared by Sadique Bilal Issa**

**INTRODUCTION**

The Kilimanjaro Initiative (KI) was born in 2005 as a result of youth-related violence, with the hope of providing alternatives to those who may find themselves in similar situations as those who perpetrated the violence. Their situation resulted from poverty and a possible belief that crime is the only means of improving or changing their economic reality. The mission of KI is to demonstrate to young people that there are other avenues available to them and their economic and social conditions should not be seen as a hindrance. With effort, perseverance and self-determination, everything and anything is possible.

KI works with different partners to achieve the overall goal of providing greener, safer and better communities for all. KI is working with York University, in Canada, and the University of Nairobi on a research project aimed at “Strengthening the role of civil society in water sector governance towards climate change adaptation in African cities -- Durban, Maputo, Nairobi”. The study sites for the this research project are both in Nairobi, Kenya: in Silanga village (in Kibera); and Huruma.

Nairobi’s existing inadequate water supply is exasperated by poor servicing and flooding, especially in disenfranchised communities. To compensate such shortfalls, environmental awareness and education can lead to more equitable governance processes that can improve access and facility to water and overcome the issues of flooding and sanitation.

Climate change affects important sectors such as agriculture, tourism, biodiversity, water, health, security and others. It compromises the economic and development growth of nations and communities and increases poverty. The community should recognize that urgent action is needed to address these issues for the benefit of present and future generations.

Climate change has the possibility of escalating conflict, causing food insecurity, increasing diseases social breakdown and creating widespread poverty; these are affecting our communities especially in low income areas. Firstly, agriculturalist or pastoralists who have their crops or herds affected by climate change and must move to urban areas in search of income are likely to end up in slums.

Moreover, the slums end up overcrowded and the existing problems of sanitation and poor water supply are exasperated. These issues need to be counter checked, before future generation are greatly affected and lose even more of the few resources it already has. In the face of climate change, people from low settlement areas are even more vulnerable and thus there is need to prepare this generation to address climate change and help prevent the damage it may have on communities.

During the first quarter of 2011, KI organized a number of activities to raise awareness on the need to manage the environment in a sustainable way and to take action in combating climate change. This was done by organizing a community forum in Kibera; and a clear-up activity around the sports field in Silanga village.

## ACTIVITIES

### Silanga Community Forum – 12 February 2011

The first KI activity for the study site of Silanga, Kibera was a community forum to discuss climate change.

The objectives were:

- To introduce the community to the research project.
- To enable University of Nairobi interns, who are assisting on the research project to familiarize them with area of study.
- To provide environmental and water management education and to give a governance overview

The activity was attended by representatives of youth groups, community based organizations (CBO), community leaders and opinion leaders. Among the groups attended included the following;

1. Silanga Settlement Executive Committee
2. Kibera Silanga Usafi group (KISUG)
3. Silanga Umoja na Maendeleo (SUM)
4. Brotherhood youth group
5. Dam view youth group
6. Silanga youth group (SYG)
7. Ghetto prodigal
8. Kibera uprising
9. Chilling point
10. Community leaders and opinion leaders.

Also in attendance were provincial administration representative Chief Ali Guyo, Nairobi University lecturer Mr. Romanus and three intern students who will be working on the project, and representative from the Nairobi Water and Sewerage Company community service.

The activity started at 1000hrs and lasted for two hours until 1200 hours. One of the Silanga village elders, Mr. Okere, welcomed all participants to the forum. Sadique Bilal of KI introduced the Nairobi University delegation, followed by brief information on the research project, objectives and the importance of having community participation on the research project. Stephen Kasoa of KI took participants through an open forum discussion on challenges and effects of climate change, water governance and possible solutions that can be gained locally.

Participants highlighted the following as challenges in regards to climate change:

- Air Pollution
- Lack of access to clean and safe water
- Flooding during rain seasons
- Improper disposal of garbage
- Burning of the garbage
- Lack of government intervention/poor governance (Community exclusion in policy making).
- Insufficient information interchanges among the community members.

The community came up with the following potential solutions and action the community may take in water governance and climate change:

- Encouraging more groups and individuals to help in garbage collection like the youth groups in the area who have been acting as positive role models.
- Recycling.
- Proper disposal of garbage.
- Encourage green plantation at the illegal dump sites.
- Local administration to hold more community sensitization forums through chief Baraza's (community meetings)

Nairobi Water and Sewerage Company (NWSC) highlighted on the problems facing water supply in Nairobi

- Illegal water connection
- Poor road networks
- Vandalism
- Blockages
- Climate change (low water levels at the main sources), thus making them having to ration water to its consumers

The NWSC said they are dedicated to provision of quality water although the individual water connection is not allowed. They recommend a registered community group application. They also requested the community members to pay bills in time and avoid water disconnection. They argued members must preserve water and encourage water recycling. Members of the community raised concern on some areas lacking water and lack of meter inspection whereby the vendors end up paying based on estimations which is very expensive to the poor communities. Sometimes vendors are forced to sell water at a higher price than normal. NWSC promised to follow up on this concern.

The area chief encouraged the community to join hands and work as a team to reduce these challenges and promised to inform the community on the same issues during monthly community forums.

Overall, the activity was well attended and the leaders promised to be committed in achieving the objectives of the project. This is fundamental for the development of any project in Kibera.

Based on the meeting deliberations, the community understands that we have changes in our weather patterns although they cannot clearly link this to climate change. Therefore more specific training and forums on climate change variables and adaptations need to be organized to sensitize the community on the most pressing challenges of climate change.

#### Garbage Collection, Silanga, Kibera – 15 & 16 February 2011

As urban environmental problems worsen in developing countries, non-conventional approaches to urban pressure points like waste management will have to be adopted. The recycling of solid and organic waste is one approach, which has positive ramifications in creating informal employment and offering an environmentally sound solution to waste management problems. While there is considerable documentation on innovative community-level waste management schemes in Asian and Latin American cities, little research has been done on the importance of, and potential for, waste re-use in African cities. As a city with critical waste management problems and a burgeoning informal sector, Nairobi possesses both the need and potential for an innovative approach to its waste problems.

One alternative waste management technique is the urban poor's re-use of refuse. Waste recycling is often undertaken as a survival strategy when the urban poor are unable to obtain formal employment, and when non-waste resources are scarce or unaffordable. Waste re-use also plays a role in improving the urban physical environment. By reducing the total amount of solid waste headed for the landfill (or left lying to rot in the streets), recycling and composting are land-saving and pollution-reducing strategies. Waste re-use also plays a valuable resource conserving role: by recycling materials, further exploitation of scarce natural resources is minimized, thus containing the spreading ecological footprint of the city. Despite these environmentally and socially beneficial aspects of waste recycling, it is not without its negative impacts, which include exploitation by waste buyers and poor health and living conditions for the urban poor who deal in waste picking.

Several community groups in Nairobi's low-income areas (Kibera) are working with the environment as a main focus of their activities. They use garbage-collection and recycling as forms of income generation.

KI organized a two day community clean up with some of these groups, as part of the environmental education and orientation program, with emphasis on sustainable environmental. We mobilized 200 hundred youths from various community organizations for two days to do clean up around the sports field upgraded by KI, Ngong River and Nairobi dam.

We donated some garbage collection equipment including gloves, refuse bags, dust masks to three youth groups, to help them carry out their activities effectively.

The following youths groups from Silanga village, Kibera, participated in the two days clean up exercise:

- Silanga youth group
- Brotherhood youth group
- Ghetto prodigals self help group
- Chilling point youth group
- Morefire football club
- Undugu youths football club
- Undugu Beckman girls football team

The clean up was a big success as the youths demonstrated how important it is for the community to join hands and address environmental challenges. They unblocked drainage, cleaned-up around the sports field, Ngong River and part of the chocked Nairobi dam.

#### Challenges

- We lacked clean up tools as youth turned up in higher numbers than we expected. Therefore they were forced to share the few tools we had.
- Transporting non-recyclable garbage contents to the dumping site was a problem as the City Council of Nairobi does not offer services to informal settlements. We had to rely on private companies, which is expensive.

## **APPENDIX C**

### **KENDREN PROGRESS REPORT**

Under the CCAA project, in the past Quarter we have carried out a number of Activities:

#### 1) Debt Clinics

Within the overall KENDREN programmatic intervention, Economic Governance is one of the key 3 pillars. Within this, public economic literacy is a major delivery tool. Debt Clinics are essentially community engagement forums where we catalyze discussions and engagement across a wide range of contemporary issues and mainly as they relate to the national development strategy, national economy and the broader developmental and political economy issues.

With the ongoing reform agenda in the country, Governance has become a recurrent theme of discussion. Mainly our clinics are around Public Resource Management and Public Finance Management. In this regard we have held 2 clinics specifically on water governance both as a resource and as it fits within the broader financial management structure.

This has greatly been informed by the whole devolution framework that is underway. We have sought to facilitate a discussion and dialogue that unpacks the issues for citizenry understanding and engagement.

A core output of these clinics has been the formation of a loose network within the Huruma community that is focused on issues of water access and management and is engaging the city council water directorate in this regard.

We have also been able to facilitate a meeting with the local administration, the local councilor and with the water services board.

#### 2) Climate Change Teach-ins

After the PAR Training, we have had a Climate Change Teach – in session in Huruma. The main outputs of this teach in, was multi fold:

- To reflect on the PAR training especially the experience, lessons and appreciation of how this can inform the work that they are engaging in.
- In 2009, in the run up to the Copenhagen Summit, we held a live interactive virtual teleconferencing from Huruma with delegates at the Conference and Kilimaforum CSO space. This meeting was an exploratory consultation on the opportunity to do the same in the run up to Durban.
- This teach in agreed that while climate change was a major challenge especially for the vulnerable, it was still important to continue the community initiatives that were building capacity on the understanding around climate change and especially

- the political dimensions of the debate, since lately a lot more organizations were active on the ground all talking about climate change.
- Another core output of this was understanding the community expectations' more specifically after the PAR training. This is as relates to the set of expectations highlighted during the PAR Training and rationalizing this to concrete achievable and attainable outputs.
  - We have also met with the core community organizations that are directly working in relation to this project. These are namely the Youth Garbage Collection Initiative, the Car Wash team at Kambi Moto Village and at Kiamaiko and the Muungano wa Wanavijiji.

The student seconded to KENDREN by the university has already held planning and coordination meetings with us and has been on an immersion and induction visit to Huruma.

A joint work plan has been developed with the student and it has equally been agreed that he will be involved during the debt clinics and other activities that KENDREN carries out in the area. This has also been amplified through joint meetings that have continued to be held by the whole CCAA team in Nairobi mainly under the stewardship of Prof. Ndegwa at UON.

Thus far, the project has elicited a number of challenges through experiences in implementation:

- The delayed engagement with student in terms of immersion in the local community and liaison/partnership with the organization has meant that this has slowed down the progress at the inception level. This has now happened and things are moving smoothly between KENDREN-Student-Community.
- The PAR training whereas it served to inform and generate an understanding with the community members, it has also raised expectations of which some might not be tenable within the lifetime of the project.
- Some community members have been reluctant to be involved feeling that they are the object of study.
- In Huruma, water is viewed as a market community and there are major contestations around this. This has in a big way slowed progress since we first have had to navigate through these deep-seated community dynamics.
- In terms of lessons learnt:
  - It is important to involve the community in the process of designing the project so that they have a clearer understanding of their roles and responsibilities.
  - University – NGO – Student working framework is a new model that is both innovative and interesting. But all the same it is good to give some lead-time to deal with the teething issues.
  - Broadly, there is need to have a framework of deliverables that the community feels is beneficial to them. Whether it facilitating access to information, to decision makers, etc. Communities all too often measure progress on tangibles.



- There is need to document project outputs and successes in way that is easily consumable to the community.
- A recurring question is on what happens beyond the project expiry in terms of sustainability.

## Conclusion

The project now has the hindsight of lessons learnt and intends to move forward in the next implementation phase in a more coordinated and smooth manner.

Consistently a backward forward information sharing mechanism will be established in the upcoming phase so as to make sure that outputs are readily realized.

## **APPENDIX D**

### **PROGRAMA PILOTO DE EDUCAÇÃO AMBIENTAL**

#### **Pequenos Gestos Grandes Mudanças Água e Mudanças Climáticas**

**Maputo, May 2011**

#### **Índice**

1. APRESENTAÇÃO
2. OBJECTIVOS
3. PÚBLICO-ALVO
4. METODOLOGIA
5. TEMAS
6. PLANO DE ACTIVIDADES
7. MONITORIA E AVALIAÇÕES

## 1. APRESENTAÇÃO

No período de 22 – 28 de Agosto de 2010 Organizações Não Governamentais (ONGS) e Instituições académicas de Durban, Maputo e Nairobi participaram de uma conferência no Brasil organizada pelo instituto brasileiro “Ecoar para a Cidadania”. O encontro teve como objectivo planear a implementação do projecto “Strengthening the role of civil society in water sector governance towards climate change adaptation in African cities — Durban, Maputo, Nairobi”.

Este projecto de pesquisa terá a duração de 3 anos, é apoiado pelo programa Climate Change Adaptation in Africa (CCAA) e uma iniciativa conjunta do International Development Research Centre of Canada (IDRC) e do United Kingdom’s Department for International Development. O projecto é coordenado pela Universidade de York em Toronto no Canadá e tem como objectivo apoiar e unir Universidades e ONGs ambientais na criação de programas/ projectos de educação ambiental e desenvolvimento comunitário frente às mudanças climáticas, sobretudo relacionadas com a gestão da água nas áreas urbanas.

A nível da cidade de Maputo a Justiça Ambiental e a Universidade Eduardo Mondlane – Faculdade de Educação – Curso de Educação Ambiental são as instituições responsáveis por implementar programas-piloto de educação ambiental em escolas.

A Justiça Ambiental (JA!) é uma associação que foi fundada em 2004 por um grupo de amigos que estavam preocupados com a maneira como Moçambique se estava a desenvolver na economia global desregulada. Em particular com o facto de os líderes estarem imprudentemente a adoptar um padrão de desenvolvimento industrial destrutivo orientado para o investimento estrangeiro. Com a jovem democracia, uma sociedade civil relativamente fraca, um sistema legal inacessível, e a maioria da população dependente do ambiente natural para a sua sobrevivência, estavam preocupados com o sacrificio do património natural de Moçambique, dos meios de subsistência sustentáveis e saúde ambiental do povo em benefício dos grandes grupos empresariais.

A JA! faz sensibilização pública e campanhas contra práticas que causam danos ambientais em Moçambique. Concentra-se em fornecer informações actuais através de pesquisa e apoio às comunidades que enfrentam ameaças ambientais/sociais e tem como objectivo promover a consciencialização e solidariedade entre as comunidades. Apoia as comunidades através da prestação de assistência estratégica, aconselhamento técnico e informações. O apoio às comunidades é considerado como uma contribuição para a governação ambiental democrática.

A Universidade Eduardo Mondlane (UEM) é a instituição de ensino superior mais antiga de Moçambique. Foi fundada em 1962, sob a designação de Estudos Gerais Universitários de Moçambique. Mais tarde, depois da Independência foi-lhe atribuída o nome de Universidade Eduardo Mondlane existindo até hoje como a única

Universidade pública do País.

A Faculdade de Educação está inserida na UEM. Tem por vocação a formação inicial de educadores profissionais bem como a realização de estudos científicos que contribuem para a melhoria da prática educativa nas escolas, a formulação de políticas educativas e a tomada de decisões melhor informadas. Um dos cursos licenciados pela Faculdade de Educação é o da Educação Ambiental, que começou a formar alunos em 2010.

O programa piloto de Educação Ambiental pauta pelos mesmos ideais e princípios que os Programas de Educação Ambiental existentes no País (exemplo O Programa de Educação, Comunicação e Divulgação Ambiental – PECODA) assim como constitui um dos pilares das acções prioritárias do Plano Estratégico do sector de Ambiente de Moçambique (2005 - 2015).

Este programa piloto é de extrema importância pois contribuirá para a criação de uma consciência sobre as questões ambientais nas escolas onde será implementado assim como constituirá uma oportunidade aos alunos do curso de Educação Ambiental para aplicarem as metodologias de educação aprendidas ao longo do curso.

## 2. OBJECTIVOS

### Objectivo Geral

Despertar uma consciência crítica sobre as questões ambientais nas escolas, envolvendo alunos e professores em palestras e actividades lúdicas sobre os temas de mudanças climáticas e água. Assim como desenvolver métodos de educação ambiental na promoção da qualidade ambiental ao nível das escolas.

### Objectivos específicos

- Sensibilizar os alunos sobre o problema de mudanças climáticas, promovendo medidas de protecção e conservação da natureza;
- Sensibilizar os alunos sobre importância e disponibilidade de água no Mundo, assim como dos impactos das mudanças climáticas na água;
- Incentivar práticas de poupança de água e uso eficiente da mesma tendo em conta as consequências das mudanças climáticas; Promover a participação da comunidade estudantil em acções de educação ambiental;
- Aplicar modelos de educação ambiental interactivos e participativos; e
- Incentivar os alunos a adoptar uma postura de participação cívica.

## 3. PÚBLICO-ALVO

Alunos e professores de classes sem exame durante 2 anos do ensino secundário Moçambicano.

Escolas Seleccionadas

Escola Secundária Eduardo Mondlane - É uma escola pública e localiza-se no Bairro Ferroviário – Cidade de Maputo.

Colégio Arco-Íris - É uma escola privada – É uma escola privada e localiza-se na Av. Eduardo Mondlane – Cidade de Maputo.

Casa do Gaiato – É uma instituição de caridade, que acolhe crianças e jovens. Engloba uma escola de ensino primário, básico e secundário. A casa funciona como internato, centro dia e ajuda à comunidade. Localiza-se no bairro da Massaca, no Distrito de Boane, Província de Maputo

#### 4. METODOLOGIA

Serão utilizados métodos interactivos e participativos assim como recursos didácticos eficientes de maneira que haja uma boa assimilação dos temas expostos.

##### Métodos de Ensino

Método de Elaboração Conjunto (MEC): Consiste na interacção activa entre professor/aluno visando a obtenção de novos conhecimentos, habilidades, competências no sentido de aprofundar os conceitos já discutidos.

Método de Trabalho em Grupo (MTG): Consiste basicamente em distribuir temas de estudo iguais ou diferentes a grupos fixos ou variáveis, compostos de três a cinco alunos.

Método de Trabalho Independente (MTI): Consiste na aplicação de tarefas para serem resolvidas de forma independente pelos alunos, porém dirigidas e orientadas pelo professor.

Secções Lúdicas (SL): Jogos e brincadeiras que possibilitarão os participantes a fixarem os conhecimentos adquiridos, desenvolvendo a imaginação, sensibilidade e criatividade.

##### Recursos didácticos

Audiovisuais (A): Exibição de filmes e slides sobre temas direccionados que permitirão os alunos observar situações ocorridas em lugares e momentos diferentes.

Mesa redonda (MR): Apresentação e discussão de temas de forma a desenvolver a habilidade mental dos alunos com base na argumentação lógica.

Ilustrativos (I): Exibição de livros, cartazes e panfletos

Quadro negro/Branco

Giz

## 5. TEMAS

Os temas do presente programa, foram seleccionados tendo em conta as principais preocupações ambientais da actualidade. Sendo estes Mudanças climáticas, Poluição e Água.

### I. Mudanças Climáticas

De acordo com os dados da ONU, no decorrer do ano de 2007, 117 milhões de pessoas em todo o mundo foram vítimas de cerca de trezentos desastres naturais, incluindo secas devastadoras na China e na África, inundações nos continentes Asiático e Africano – o que resultou em um prejuízo total de 15 biliões de dolares. A maioria dos países menos desenvolvidos têm vindo a enfrentar períodos irregulares de chuvas, e as previsões para o futuro indicam que as mudanças climáticas vão tornar a oferta de água cada vez menos previsível e confiável, assim como existirão cada vez mais áreas desertas.

#### Tópicos

- 1.1 Meio ambiente e surgimento dos movimentos ambientais
- 1.2 Principais Conceitos (mudanças climáticas, efeito de estufa, variações climáticas)
- 1.3 Causas das Mudanças climáticas
- 1.4 Consequência das Mudanças climáticas - Desastres naturais e ambientais
- 1.5 Previsões dos efeitos das mudanças climáticas a nível mundial e nacionais
- 1.6 Boas práticas – Pequenos Gestos Grandes Mudanças

### II. Poluição

A poluição é a deposição de substâncias no meio ambiente, que provocam efeitos negativos no equilíbrio ambiental, causando assim danos à saúde de muitos seres (humanos e animais) no presente ecossistema.

A contaminação é a presença, num ambiente, de seres patogénicos, que provocam doenças, ou substâncias, quando existem em concentrações demasiadas elevadas que são nocivas ao ser humano.

Tanto a poluição como a contaminação são problemas que atinge a todos: países ricos e pobres, contudo a factura é paga sobretudo pelos últimos.

Uma pesquisa de David Pimentel da Universidade de Cornell que está localizada em Nova York - Estados Unido, indica que cerca de 40% das mortes verificadas a nível mundial estão associadas à poluição da água, poluição do ar e poluição do solo.

Mais de 35 milhões de asiáticos correm o risco de beber água contaminada com arsénio. Bangladesh, China, Índia, Tailândia, Nepal e Taiwan são os mais afectados por esta contaminação das águas. No Bangladesh cerca de 60 milhões de pessoas bebem água

com uma contaminação de arsénio superior ao normal, de 0,01 miligramas por litro, estabelecido pela Organização Mundial de Saúde (OMS)

#### Tópicos

- 2.1 Conceitos de poluição e contaminação
- 2.2 Poluição Atmosférica
- 2.3 Poluição Aquática
- 2.4 Poluição Sonora
- 2.5 Poluição Luminosa e Visual
- 2.6 Poluição no Mundo e em Moçambique
- 2.7 Poluição no contexto das Mudanças climáticas
- 2.8 Boas práticas – Pequenos Gestos Grandes Mudanças

### III. Água

#### Água é VIDA!

Há cerca de 4 biliões de anos, surgiram as primeiras formas de vida na água – os seres microscópicos, que extraíam a energia do dióxido de carbono (CO<sub>2</sub>) para sobreviver. Há apenas 315 milhões de anos que apareceram os primeiros anfíbios capazes de se locomover fora da água. Há “apenas” 4 milhões de anos – surgiram os primeiros homínídeos. Hoje, milhões de espécies vivem fora da água, mas todas elas necessitam desse precioso líquido para sobreviver.

A água compõe os oceanos, mares, rios, lagos, nascentes e poços. Chega às torneiras fabricadas pelo Homem. Faz parte da seiva das plantas, do líquido dos frutos, de nosso sangue e suor. Como vapor, espalha-se pela atmosfera e gera nuvens, torna-se neve, granizo, geleiras.

De toda água existente no planeta terra, 97,5% é salgada e apenas 2,5% é própria para o consumo humano.

Em áreas urbanas os ciclos ecológicos são alterados e o ser humano tende a perder a noção da lentidão dos processos na natureza, tornando-se necessário sensibilizar as pessoas para o uso sustentável dos recursos hídricos, com especial destaque para os gastos quotidianos de água.

#### Tópicos

- 3.1 Ciclo da água
- 3.2 Importância da água
- 3.3 Disponibilidade de água potável no mundo e em Moçambique
- 3.4 Consequências do uso irracional da água
- 3.5 Impactos das Mudanças climáticas nos recursos hídricos em Moçambique
- 3.6 Boas práticas – Pequenos Gestos Grandes Mudanças

### 6. PLANO DE ACTIVIDADES

Periodicidade das aulas: Todos os meses - 1 vez por semana

Tempo das aulas: 45 minutos

Dia da Semana: Quartas - Feiras

## 7. MONITORIA E AVALIAÇÕES

Cada turma será submetida a 3 avaliações, a primeira no início de projecto, a segunda a meio do projecto e a última (terceira) no final do projecto.

O objectivo da primeira é de avaliar o nível de conhecimento em termos ambientais do estudante antes do projecto começar. As restantes servirão para perceber a evolução do projecto.

As avaliações permitirão também fazer uma comparação entre as turmas e as escolas envolvidas no projecto através destas 3 avaliações.



## APPENDIX E

### Mulher Gênero e Desenvolvimento (MuGeDe)

#### Projecto Vulnerabilidade Urbana e Mudanças Climáticas

#### Relatório de actividades trimestral (Março - Maio de 2011)

##### Introdução

No âmbito da Rede Internacional para a Adaptação às Mudanças Climáticas em África (CCAA), a MuGeDe-Mulher, Género e Desenvolvimento em colaboração com a Universidade Eduardo Mondlane e a Organização Justiça Ambiental, está a implementar um Projecto Ambiental denominado Vulnerabilidade Urbana e Mudanças Climáticas, com enfoque para a gestão de água e saneamento, administrado pela Universidade de York, Toronto Canadá. O objectivo geral do projecto é contribuir para a educação ambiental participativa e cívica das comunidades locais relacionando às mudanças do clima, à gestão da água e saneamento, com incidência nas áreas susceptíveis e populações vulneráveis na cidade de Maputo.

##### Bairro Malhangalene “B”

Neste contexto, no dia 14 de Abril de 2011 teve lugar na Sede Administrativa do bairro Malhangalene, na Cidade de Maputo, pelas 16:00 horas, o encontro para apresentação do Projecto acima referido, que para além da presença da equipe da MuGeDe e UEM, contou com a participação da chefe do bairro, chefes dos quarteirões, e moradores do bairro.

O objectivo deste encontro era de introduzir o projecto ao bairro de Malhangalene, explicando a necessidade de sua implementação e mobilizar a participação de todos para a sua efectivação, obedecendo 2 momentos, nomeadamente:

- Apresentação PowerPoint do Projecto;
- Momento de intervenções.

A Sra. Saquina Mucavele, Directora da MuGeDe, introduziu as linhas gerais do projecto, realçando a sua origem, dimensão, e importância do mesmo para a vida das comunidades, em especial as afectadas pelas mudanças climáticas. Referiu que o projecto está ser implementado simultaneamente em três países nomeadamente, África do Sul (Durban), Kenya (Nairobi) e Moçambique (Maputo) e é administrado pela Universidade de York-Canadá.

De seguida procedeu-se a apresentação do Projecto Climáticas pelo Técnico da MuGeDe, o Sr. Fernando Pondeca.

A segunda parte, deu-se lugar as intervenções dos residentes do bairro, onde estes louvaram a iniciativa do projecto com vista a resolver os diversos problemas que os afligem relacionados com a gestão da água que certa forma tem implicações directas na sua saúde sanitária, e mostraram-se preparados para colaborar nas actividades de mitigação e criação conjunta de mecanismos adaptação em prol do uso racional da água, preservação e saneamento do seu meio urbano.

Dos principais problemas apontados no bairro relacionados com a água destacam-se:

- O deficiente abastecimento de água, agravado pelas constantes sabotagens aos tubos de distribuição;
- A construção de latrinas perto das condutas de água;
- A falta de drenos para o escoamento das águas negras (de proveniência doméstica) e pluviais, que alagam e inundam o bairro, tornando-se vectores de doenças como malária e cólera.

De seguida, procedeu-se a apresentação da proposta do plano das actividades, dando espaço para os residentes do bairro de forma conjunta sugerirem mais acções a efectivação do mesmo.

Em consenso, o Sr. Secretário bairro, os chefes dos quarteirões e os residentes, concordaram em colaborar no levantamento ou a colecta dos dados em 2 quarteirões sobre os problemas que afectam o bairro e como forma a avaliar o nível de entendimento dos residentes sobre o ambiente, água e mudanças climáticas.

### Bairro Central “C”

No dia 16 de Abril de 2010, realizou-se a apresentação do Projecto na sede Administrativa do bairro Central C, pelas 10:00 horas. A Sra. Saquina Mucavele, uma vez mais introduziu as linhas gerais do projecto, precedida da apresentação Power Point pelo Sr. Fernando Pondeca.

Sra. Saquina Mucavele e Sr. Fernando introduzindo o projecto no bairro Central “C” Seguiu-se depois o momento de intervenção dos residentes do bairro, onde o Sr. Silvestre Pessane, Chefe do bairro, agradeceu pela contemplação do bairro Central “C” no projecto, realçando que este é um bairro com graves problemas relacionados com a gestão da água e vulnerável aos efeitos das mudanças climáticas.

Com cerca de 8352 habitantes, o bairro tem 8.5 quilómetros de extensão, dividido em 36 quarteirões ocupados pelos moradores e 26 quarteirões ocupados pelos Ministérios, mercados e casas privadas. Por ser um bairro maioritariamente comercial, durante o dia apresenta uma forte densidade populacional.

Dos principais problemas apontados no bairro relacionados com a água destacam-se:

- Deficiente abastecimento de água, agravado pelas constantes sabotagens aos tubos de distribuição;

- O ma conservação dos tanques e reservatórios de água na maioria dos prédios, o que condiciona o seu uso para o consumo humano;
- A proliferação do lixo, agravado pela forte presença de vendedores ambulantes, que obstruem os drenos para escoamento de águas residuais e pluviométricas, agravando a vulnerabilidade deste bairro a ocorrência de inundações.

Os residentes deste bairro, acham que as respostas efectuadas pelas autoridades do Governo para estes problemas não tem surtido efeito, pois a solução não passa por pela penalização dos indivíduos sobre as más praticas em relação a água saneamento do meio, como cobranças de taxas mais sim, pelo adopção de modelos claros e eficazes para que a gestão dos resíduos sólidos.(Por exemplo em tempos passados, a Cidade de Maputo dispunha de um horários específico de recolha de lixo, este modelo foi abandonado) e a criação de sanitários públicos.

Como forma a conter a destruição das condutas de distribuição de água e a degradação do meio, a nível do bairro foram criadas 2 associações de vendedores ambulantes “TSOTSI” e “SOCAVA”, porém os objectivos pelo qual foram criadas não estão a surtir efeito, e continua a aumentar o número de vendedores provenientes dos mercados formais estabelecidos em zonas fora dos centros urbanos como no Bairro do Zimpeto, alegando que naquele local não conseguem vender os seus produtos.

Em relação a introdução de palestras de educação ambiental, consideram necessária, contudo consideram também que num bairro totalmente urbanizado e com forte potencial comercial, as estruturas locais responsáveis são os actores chaves neste processo, pois as acções a implementar são de grande dimensão.

#### Palestras de educação Ambiental participativa no bairro de Malhangalene “B”

No dia 20 de Maio de 2010, realizou-se a 1ª palestra de Educação Ambiental usando o método PAR, no bairro de Malhangalene “B”. O encontro reuniu um grupo de residentes do bairro, na sua maioria mulheres e jovens que afluíram com grande entusiasmo a palestra.

Este bairro está dividido em 2 grandes áreas:

- A área urbana constituída por edificios (prédios), seguindo as normas de ordenamento territorial; e
- A área peri-urbana, maioritariamente, constituída por habitações precárias e uma ocupação desordenada do espaço.

Tanto na área ordenada como na desordenada há água canalizada, porém o abastecimento regular é limitado devido a falta de manutenção dos sistemas de abastecimento e as frequentes sabotagens nos mesmos. Esta situação, é mais grave na área desordenada onde as comunidades não têm acesso total a água potável segura e um saneamento saudável.

As construções desordenadas constituem um entrave para que as autoridades locais implantem um sistema de abastecimento de água e drenagem eficiente. Os efeitos desta situação são visíveis, onde por todo bairro nota-se a invasão de águas negras e residuais de uma casa para a outra. Pequenos períodos de precipitação impedem a circulação dos seus residentes e põem ao relento grande parte das famílias, devidas as inundações.

Realizou-se o questionário para avaliar a percepção dos residentes locais sobre o meio ambiente gestão da água e mudanças climáticas, onde apuramos que grande parte destes não tem conhecimento sobre as mudanças climáticas e os seus efeitos sobre a água no seu bairro. Contudo, afirmam que há uma má gestão da água, com consequências directas no saneamento do bairro principalmente na área desordenada.

Os itens abordados durante a palestra foram:

- A identificação conjunta dos problemas causados pela má gestão da água;
- A consciencialização da necessidade de mudança de hábitos individuais e a partilha de pequenas experiências e boas práticas na conservação da água e higiene sanitária.
- Como conciliar as acções locais com as acções dos principais intervenientes do governo, como Conselho Municipal de Maputo (CMM), Fundo de Investimento e Património de Abastecimento de Água (FIPAG), Ministério das Obras Publicas e Habitação (MOPH), etc.

A palestra foi muito interactiva, e ao longo da mesma sempre procurou-se abordar a água como um recurso escasso, para uma melhor distribuição e utilização sustentável e, a necessidade de uma gestão integrada de modo a se maximizar os benefícios para a comunidade, quer no presente como no futuro.

## **APPENDIX F**

### **South Durban Community Environmental Alliance (SDCEA) Progress Report**

Interning student Alex Todd from York University worked on various issues within the SDCEA providing much valuable input on community mobilization campaigns through his comparison of climate devastations in Canada and Durban. The similarities were astounding which painted a picture of climate change being a global phenomenon that affects people from all over the world.

A number of projects were carried out from the beginning of this year. These range from environmental education and awareness campaigns with communities and youth, COP17 mobilisation campaigning as well as health impact campaigns. Students from approximately 160 schools have taken part in various workshops where presentations highlighted the need for organic farming methods and ways in which learners could grow their own garden that is free of pesticides and harmful substances. Students were also handed seeds, garden equipment as well as compost to start their very own sustainable food gardens at schools.

PAR training was done in March 2011 during the first year of the project as well. This was conducted by Patrick Mbanjwa. It was one of those experiences that leave you understanding the subjects of your study area on a more scientific level making the connection far easier to understand.

In March 2011 a meeting was held with the eThekweni Municipality discussing how the city was geared up to deal with water issues that plague the city of Durban. This meeting was arranged together with Umphilo waManzi (another NGO also working on the project) in a roundtable discussion with Neil Mcleod (head of eThekweni Water and Sanitation), Megan Lewis (Environment and Climate Protection Department) as well as local community members from Folweni, Mkhanya, Umbumbulu and south Durban. Megan Lewis spoke on the table of intervention, which was quite significant as this focused on the risks that community's face and how climate change will further impact their lives. It is predicted that sea level rise could reach 2,74mm per year along the eThekweni coastline. Local municipality is working with many communities to determine what climate change means to people on the ground, as this is not more just a science but a reality that is affecting all communities. The Integrated Assessment Tool serves to educate people about different ideas that can enhance their sustainable livelihoods like rain water harvesting and roof gardening. These projects are still in pilot phases and once a positive outcome is seen, it will be then a fully working project in the communities.

Neil Mcleod gave us an idea of the water shortages that can be expected in the near future as year 2010 was named as the fourth drought year since rainfall records were first kept. Alternatives are being looked at to sustain a good water supply for the people of Durban.

However, Spring Grove Dam (which can hold 60Ml) will only be ready in 2014. Various other strategies were also investigated, which was the recycling of effluent (which can hold 110Ml) will only be ready in 2013/2014, a desalination plant besides it being expensive can only be ready in 2013/2014 as well. The Mkomazi dam has a capital cost of estimated at R20 billion, will only be ready in 2024. With all these shortfalls, the municipality had to look at other ways in which to cater for the needs of the people of Durban.

After this discussion, a more local approach was reflected upon by the various community representatives. Inkosi Makhanya shared his experience of drought and cattle farming. He says that the season patterns have changed where the storms have resulted in floods washing bridges and homes away.

Thereafter, participants broke up into area based groups discussing ways in which to promote environmental awareness of climate change. Our group focused on the Wentworth area. Some of the concerns raised were:

- Education by handing out pamphlets and fliers
- Education on organic food gardening
- Education on ways in which to save water (Fill a 2l bottle with water, place in the toilet cistern. This bottle will displace the water that is used to fill the cistern.)
- River quality – how does climate change affect river quality
- Education on alien plants, water shortage

On the 26th July 2011, SDCEA launched a climate change book called “Feeling the heat in Durban: People’s struggles and climate change”. This book explains the effects of climate change and the devastating effects that people have been burdened with over the recent years. In the last 5 years, people have noticed tornadoes ripping through their part of town completely destroying homes, cars and infrastructure. The communities affected have no insurances from which to claim from as many of these homes are informal settlements. People do not have coping mechanisms with which to deal with such devastation. In 2007 and 2008, severe flooding had caused the closure of many roads and areas as these became inaccessible to motorists and disaster relief teams. The northern and southern coastline of Durban was completely eroded washing away roads and homes. Hence it was so important for this book to be published.

## APPENDIX G

### Climate Change and Water in eThekweni: Civil society adaptation in a hot climate

#### Umphilo waManzi, 9-10 March 2011

9 March 2011: eThekweni Boardroom, Prior Road

8:30 Registration

9:00 Welcome, introductions, and Setting the scene: Mary Galvin

9:20 Experiences in local areas: Inkhosi Makhanya and Inkosi Ngcobo

9:40 Climate Change in eThekweni: Head of eThekweni Climate Change and Community Adaptation

10:00 Questions and discussion

*10:30 Tea*

11:00 Climate Change and Water—eThekweni Water's Strategy: Neil Macleod, Head of eThekweni Water and Sanitation

11:20 Questions and discussion

*12:30 Lunch*

1:30 Discussion of overall impressions: civil society leaders

2:00 Climate Change and Water Project (York Univ/ Umphilo waManzi/ SDCEA/ CCS): Dudu Khumalo and Lushendrie Naidoo

2:20 Questions

2:40 Community issues: Simphiwe Nojiyeza to introduce group work (take tea as work)

3:15 Report backs

3:30 Small groups per area: logistics planning for community workshops

4:00 Thanks and closure

10 March 2011: Mvula Trust training room, Esther Roberts/ Frere Rd

- Introduction of the concept and benefit of Participatory Action Research
- Explanation and practice of the tools including: timelines, power maps/ Venn diagrams, transect walk, elder interviews, indigenous knowledge stories
- Applying the tools in our project



## APPENDIX H

### Umphilo waManzi Water and Climate Change Adaptation Workshop Notes

#### Stakeholder Meeting on the 9<sup>th</sup> of March 2011

##### Welcoming presentation by Dr. Mary Galvin

The Director of Umphilo WaManzi, Dr Mary Galvin outlined the purpose of the workshop, stakeholders that are involved in the project. She began by creating awareness about 'Global Warming' and 'Climate Change'. She emphasized that industries and citizens pollute, governments regulate and international organisations negotiate towards mitigation. Whilst there are negotiations, there is low expectations regarding negotiations that take place in Conference of the Parties and the whole world is stuck on equity issues and low emission targets. In that regard most of the developing countries are anticipating and getting ready for impacts of climate change and the only option they are left with is to adapt. There are diverse views shared by those that believe that we should not adapt to climate change and only mitigate and those that see adaptation as a key strategy. Mitigation is essential because we don't want to remove pressure from those responsible for pollution and particularly for the case for renewable and efficient energy production. We therefore need to balance adaptation and mitigation. Whether or not negotiations are "successful", we still need adaptation, particularly the case for water related climate change. Not planning for adaptation is asking for disasters and loss of human life, mostly at the level of the poorest and most vulnerable levels of the society.

There are a number of cases of acid mine drainage especially in Gauteng province which are caused by discharging effluents from the mines. There is also enormous water usage in coal electricity generation plants by ESKOM and projections are that this could lead to water scarcity in future. Over and above acid mine drainage, there are also incidences of contamination of our water resources that result in poor water quality due to poor capacity of municipalities to manage our waste water treatment plants and to regulate effluent discharges by corporations. Climate change leads to floods and drought that affects food security and leads to migrations that lead to various types of conflict (inside the family, between communities, and between countries).

About 75 to 250 million people in Africa will be exposed to increased water stress by 2020. Africa is expected to experience increases in temperatures and the intensity of precipitation, storms, droughts and extreme events. The changes in average precipitation are less certain but will become more erratic and lead to shifting in seasons. This could exacerbate or relieve existing vulnerabilities which are not new issues. In dealing with all of this there is a need to increase the robustness of their systems by assessing the impacts across multiple scenarios (Heath et al, 2010).

In the Southern African Region, there is little change in overall rainfall, however, regional changes (some places will be wetter and others drier) are experienced. Heavy

rainfall and flooding interspersed by droughts, more tropical cyclones, hail, tornadoes and lightning will be widespread. How susceptible people are will depend on their economic/political situation, their behaviours, and their ability to bounce back. In that regard, pragmatic adaptation that includes development of the resilience of water and sanitation systems, managing of risks, building peoples' capacity to deal with unpredictable events and prioritising will be key interventions.

Some of the Common Adaptation measures that need to be undertaken are:

- Local Service Provider need to ensure that affordable and accessible water supply is available, expand kiosk network into un-served areas, investigate alternative supplies to use during droughts and embark on community education and hygiene promotion on the risks to health during droughts

In dealing with flood risks local service providers need to undertake the following:

- Facilitate community education and hygiene promotion on the risks associated with floods, education on best practice for latrine construction to prevent latrine collapse and overflowing, protect boreholes and pipe network from flooding, conduct regular sanitary inspections during floods and ensure tighter enforcement against fly tipping and chlorinate water supply during floods.

The utility needs to support the expansion of new kiosks, build new storage tanks and investigate the recharge rate/sustainable yield of aquifers. Regarding flood risks the utility needs to embark on leak detection and pipe maintenance, reduce illegal connections and improve the hydrostatic pressure, monitor water quality during floods and conduct regular inspection of infrastructure during floods. The Council needs to engage in water allocation dialogues, improve drainage systems, clear and maintain drains, promulgate legislation against dumping, improve solid waste collection, subsidise tanker/waste disposal options and improve land management activities to reduce severity of floods.

Regarding Durban, the demand for water exceeds the current supply and the city is facing a water crisis. Water restrictions are likely going to happen soon because 400 litres of water per household per day is the estimated current consumption rate. Right now, middle class households use close to that much per person. Poor households use an average of 50 litres per person per day, which is 9 kilolitres of free basic water per month for a household of 5 people. Variable rainfall due to climate change is expected to put more pressure on water resources and poor people. All rural Africans recognize the signs of climate change, even if they do not know the science behind the causes. This knowledge gives a certain capacity to adapt, to become resilient. There is a need to recognize and record that specific knowledge and globally transmit and educate people about it in a way that builds up people's resilience.

Our entry point in Durban is the project that uMphilo waManzi is doing with York University of Canada together with universities and CSOs in Nairobi, Maputo and Durban, funded by IDRC. The objective of the project is to facilitate CSO engagement

with municipalities in large African cities around adaptation and water. The project partners in Durban are UKZN Centre for Civil Society, Umphilo waManzi and SDCEA. There is partial funding which covers the university's role and activities at the community level. Umphilo waManzi (Umphilo) is a member of Climate Justice Now and national Rain Water Harvesting network. Umphilo is a non-profit organisation that engages in action research and advocacy. Our work on this project includes setting up and identifying communities, providing background information and PAR training for activists, initiating contact with the municipality around plans, facilitating awareness raising and climate change assessments in four communities in Durban through PAR workshops, facilitating learning journey of community leaders from four communities to see different adaptation efforts, facilitating participation in COP 17 actions, conducting action planning workshops in four communities, and advocacy.

The selection of four communities in peri-rural Durban was informed by water scarcity and food security challenges, which result in usage of rainwater harvesting tanks (not use) for intensive household agriculture, poor water quality, compromised river health, and the need for community sample testing, prevalence of health and exploration of usefulness of dry sanitation such as Urine Diversion toilets, and flood preparation and responses. The Umphilo plans and ideas for COP 17 include conducting water adaptation tours to four communities in Durban. Other plans include creating a platform for community activists from a range of countries in Africa (or global) to form a large circle. One by one they speak out, profiling their personal/community experience of how CC has affected their water and lives. As one finished, s/he throws a large ball of rope to someone else across the circle. This creates a huge web that visually symbolises both the web we are caught in, created by governments and corporations... as well as the web of support that we have through our unity and sharing of information to adapt.

Input by Induna D. Walter Makhanya from Sobonakhona Traditional Council, eMbumbulu

The experiences of Umbumbulu is the same as other areas, they had to cope with drought, seasons are starting differently from what they used to see. Before, for instance, the spring season used to start on the 15<sup>th</sup> of August, but the start date has shifted to the 15<sup>th</sup> of September and summer season is now in the middle of December. The delay in seasons affect the timing of ploughing and harvesting, the ploughing time is dependent on the rainy season. Heavy rains were experienced in the last five years. The rains we have now are abnormal, ranging from storms, heavy rains, to destruction of houses and bridges. The local bridge at Umbumbulu was devastated by heavy rains and it took almost a year for eThekwini to refurbish it. Heat is experienced in winter even in coastal areas, it is now colder in summer than we used to experience before.

The changes in temperature and climatic conditions affect our water supply. Our people do not have toilets and they defecate openly. During heavy rains the faecal matter found itself in our river system and that cause diseases, such as cholera and others. The strong wind blew away houses during November of 2009. Several houses were blown away at KwaMakhutha area and a church building affected is still not repaired as we speak. We

are hoping to learn a lot from experiences of other people especially because in international meetings, there are talks about adaptation and in our experience it is difficult to adapt to climate change because it is not ending and a lot more people are affected.

Input by Induna Mazwi Mthiyane from Amaqadi Traditional Council, eMzinyathi

Our experience as Amaqadi is that we used to have winter, which was known for very cold temperatures but now we are experiencing winter throughout the year. As a community we discussed climate change before the current inkosi came to power. Our greatest concern is that our people build houses in wetlands, and a place with reeds is generally a wetland and traditionally speaking no one is allowed to build a house there. Our izinduna sells land that is zoned for wetlands because they want to make quick cash for themselves, but this land needs to be protected. The late inkosi Mzonjani Ngcobo was very strict when it comes to land allocation to new households, but the tendency now is that people build houses everywhere and there is no control anymore. The other practice that is making us more vulnerable is the cutting of trees even those that are sacred like umndoni, which is very important to the Zulu culture. The late inkosi Ngcobo was very strict in terms of granting permission regarding cutting of the trees. We believe we can still do something to prevent deaths related to global warming.

Input by Meggan Lewis, Environmental Planning and Climate Protection Department  
eThekweni Municipality Durban, South Africa

She began by providing basic data about eThekweni, which is the largest port and city on east coast of Africa. The area is about 2 300 km<sup>2</sup> and the population is about 3.6 million with about 34.4% unemployment rate and HIV/AIDS impacts, which reduce the life expectancy to 47. The City has a backlog of 370 000 housing units and it is a global biodiversity hotspot. The Municipal Climate Protection Programme (MCP) was developed in 2005 by the city. The programme has 3 components: vulnerability assessment, adaptation strategies, and development of assessment tool kits. The vulnerability assessment study was conducted between 2004 and 2006. The key outputs of the study was an assessment of the local impacts of climate change, carbon storage and a sequestration analysis. A series of adaptation strategies were developed from 2005. The key focus was to link climate change with the Integrated Development Plans (IDP), crafting a Headline Adaptation Strategy, Municipal Adaptation Plans and Community Adaptation Plans. From 2007 up until now, eThekweni is developing tool kits such as an Integrated Assessment Tool and Sea Level Rise Toolkit. Another key intervention is the mainstreaming of climate protection within the municipal programmes, which saw the Mayor Councillor Obed Mlaba demonstrating political will and leadership internationally and locally. Institutional change demonstrated so far is the establishment of the climate change protection department within the Town Planning Department in 2007 and the establishment of the energy department in 2008. Durban is going to host the Conference of the Parties (COP 17) in 2011.

In the headline adaptation strategy the three sectors that are vulnerable to climate change such as health, water and sanitation and disaster management were highlighted and given adequate attention. There are a range of potential adaptation strategies that are

highlighted within the headline adaptation plan. The headline adaptation plan highlights impacts such as flooding and sea level rise including various interventions that the city is embarking on, such as:

- Compiling a detailed analysis of latest rainfall projections and modelling,
- Using rainfall data projections developed since 30 September 2009 and throughout the period of 5 years in modelling impacts.
- Elevating flood annexure to Council Policy
- Reducing risk to developments in flood plains through amendments of bylaws to the extent that the scale of 1:100 yr in flood plains is complied with by all who wish to develop in flood lines.
- Developing master drainage plans for all river catchments within eThekweni Municipal boundaries.
- Conducting a multi-criteria analysis with a focus on impacts of risk, ancillary benefits, reversibility or flexibility, impacts on emissions, allowing complementary options, ease of implementation, institutional complexity, cost benefit analysis and risk of mal-adaptation.

The implementing agents responsible for the above activities are UKZN, Coastal and Storm Water Catchment Management Department and Climate Change Protection.

The latest development in climate change programme is the community adaptation plans which implemented pilot projects in Ntuzuma, Ntshongweni and Buffeldraai. The Buffeldraai Community Reforestation Project was developed to reforest 650 hectares of the buffer zone around the new regional landfill site. It was part of the greening of the 2010 FIFA Soccer World Cup. It demonstrated socioeconomic benefits and that ecosystem goods and services provided are water, biodiversity and carbon sequestration.

The projects in Ntuzuma and Ntshongweni are water-saving agricultural projects. The focus of the community adaptation programme is to conduct a livelihood analysis and come up with food security initiatives, such as community gardens. Communities are encouraged to grow alternative crops to their traditional maize which is amadumbe, cassava, and sweet potatoes, because there are good yields with these crops. The recommendations are based on changes in science and shifts in planting dates and the need for rainwater harvesting and conservation. The above crops were chosen because they could help communities to conserve water. Maize production requires a good rainfall whereas amadumbe, cassava and sweet potatoes cope in seasons with little or no rain. In each of the three areas a vulnerability matrix was done. The focus is on climate variability, infrastructure, social networks, food security, water and waste, demographics and livelihood strategy.

Another pilot project is the green roof project, which aims to:

- Reduce temperatures and storm water runoff
- Mitigate and adapt to climate change
- Promote inner city biodiversity

When developing the toolbox they conducted sea-level rise modeling and established that the current sea-level rise in the east coast of SA is 2.74 mm per year.

Sea-level rise scenarios anticipated are:

- 300 mm (90 % chance of happening by 2100)
- 600 mm (10 % chance of happening by 2100)
- 1000 mm (1 % chance of happening by 2100)

They also developed the toolbox called the Integrated Assessment Tool through which they evaluated long-term city plans and policies against the impacts of climate change. As part of the toolbox, educational material, documentation stores and spatial tools are provided.

#### Discussion

Mrs Perumal enquired about the planting of trees on roofs, which seems to work well in Mexico, but could be a problem in Durban because of water scarcity. Meggan explained that she understands that water is mainly for drinking and household consumption and there is very little remaining for watering plants as water is a very scarce resource. In implementing a green roof project, structural engineers assist in preventing roofs from falling apart and they regularly conduct inspection in loco. She also emphasized that there is a management plan done to ensure that the sea level rise is under control. On the explanation requested by Induna Makhanya, Meggan elaborated that cassava is used to make bread in North Africa and it is like a big madumbe. She also indicated that the city is warning communities about modelled floods and also warned them against building along river banks or next to the sea. She noted that there are low cost houses that are still built in flood plains and there is a need to sensitise the Department of Housing regarding climate change issues. There was also acknowledgement that water from rural areas is utilised in townships and urban areas which might lead to migration.

#### Presentation by Neil Macleod, Director eThekweni Water and Sanitation: entitled: Water and Climate Change

Macleod noted that 2010 was the 4th driest year since rainfall records were first kept. The dams in the regions were 20% less full at the start of 2011, compared to the start of 2010. We are seeing more severe storms but at less frequent intervals. This also has an impact on dam safety. When looking at the above figures it is crystal clear that there is no longer an argument about whether climate change is real or not. eThekweni Water and Sanitation monitor water quality status in 19 river systems and they conduct samples in all of them on a monthly basis. Each river has a profile and a picture reflecting its water quality status. The 3.6 million inhabitants of Durban consume 350 million cubic metres of water annually and the dams and other storage facilities produce below the 350 million cubic metres required. In 1983 there were water restrictions, which are likely going to be introduced in 2012. eThekweni requires about 400 million cubic metres, which is currently above our supply capacity.

In dealing with the demand scenarios that exceed supply capacity, government is looking at various options. The resource options that are being evaluated are Spring Grove Dam that could provide an extra 60 million cubic metres of water when it is completed by 2014. Another option is the recycling of treated effluent, which could provide an

additional 110 Million cubic metres of water by 2013 or 2014, when it is completed. Another option is the establishment of a desalination plant by either 2013 or 2014. The construction of a desalination plant could cost about R2 billion. The other option is the establishment of Mkhomazi dam, whose capital cost is estimated at R20 billion and estimated to be completed by 2024. eThekweni Water and Sanitation built over 200 rainwater harvesting tanks and they were linked to various community gardens. The rainwater harvesting tanks were used to water gardens and not for drinking purposes. In order to scale up the project, donors are required as the municipality is not capable of doing this alone. Rainwater harvesting is not the core business of the municipality and donors and NGOs such as Valley Trust are encouraged to play a role. Rainwater harvesting has less effects compared to other interventions. Another intervention is the reduction in non-revenue water from 40% to 25% over 5 years. In 1994, the non-revenue water or water losses were estimated to be about 80% in KwaMashu and Umlazi Townships. Umlazi Townships had about 700 water leaks when eThekweni took over from the KwaZulu Homeland Administration. All meters and pipes that were installed 20 years ago are being replaced to avoid further non-revenue water losses.

Water theft contributes 10% to water losses and about 20 000 households are guilty of having illegal connections. The city purchases R30 million worth of water a year and illegal connections push the water prices up. Reducing water pressure to avoid water leaks, replacing asbestos pipes with copper, replacing old meters with new ones, and dealing with illegal connections are some of the initiatives undertaken to reduce non-revenue water. The amnesty project is aimed at identifying households that illegally connected to water and encourage them to pay R250 to legalise their water connections. If they do not come forward, legal processes will be instituted against them. Such measures include attachment of their assets by various court sheriffs in order to recover costs. About 100 households are already before the courts for illegal connection of water.

The Nutrient recovery project undertaken includes:

- Improving river water quality, which is essential for a sustainable future. eThekweni Water and Sanitation is monitoring river quality in a number of rivers under their jurisdiction. Communities could use water from various river sources to water their gardens, provided it is not contaminated with harmful effluents. The state of rivers is reported in the website of the municipality and no community education is provided. The city is expecting NGOs working in river health to provide community education. The city is also participating in some of the Catchment Management Forums in which reports on the state of water quality in rivers is presented. The City is also working with the Department of Water Affairs in and adopt-a-river programme. One of the rivers that was adopted is Isipingo River as a National flagship programme.
- We are looking at natural processes to remove nutrients and pathogens from treated effluent at conventional sewage treatment plants
- Urine separation and the recovery of nutrients from urine is an attractive option
- Pit sludge to pathogen free fertilizer pellets! In making compost the municipality is using sludge, garden refuse and sugarcane residue. The recycling of effluents is also going ahead. The city is planning to take recycled water back to reservoirs,

where waste water treatment plants are redirected to the water system. The recycled water is safe to drink after being treated.

Another initiative is an energy recovery project which has the following components:

- Mini turbines in the western aqueduct
- Micro/pico turbines on reservoir inlets
- Wind turbines on reservoir high sites
- Solar panel farms on reservoir roofs
- Gas to energy
- Oil from algae

### Discussion

The method used to consult communities that illegally connect to water

It has been established that only 5% of our community read newspapers, in that regard at least 50 wards are targeted through community meeting so as to convey the message that households have an option of paying R250 to avoid legal action taken against them.

eThekwini Water and Sanitation through Mandla Malakoane did many radio interviews to conscientise people about their responsibility to pay for water. Defaulting households have 3 months to pay R250 to legalise their water connections. Households were given enough time to make their water connections legal. The first 100 households cases are being heard in various courts. If the City is successful, peoples' properties would be attached and if people cooperate on time they would pay R250 and their connections would be legal again. Customer Service Agents are also working hard to inform communities about illegal connections and creating opportunities to make their connections legal again.

The customers that bypass meters are not just households only, but also industries that illegally connect to water. There is also confusion as to whether some cases are illegal connection or just leaking pipes. There could be a good justification if flow limiters were installed in areas where the middle class also live. This could be done by stopping people from using water in driveways, washing cars, watering English gardens, etc. As much as flow limiters could be installed in all areas, there is a need to encourage middle class to use water since most of the revenue is derived from them. The flow limiter cost R100 to install as well as to remove. There is no legislation to reduce toilet flush volume of water used from 12 litres to 6 litres as done in other countries. Communities are encouraged to report leaks and take advantage of the toll-free call service, because 90% of the calls are dealt with within 24 hours.

### Wind Turbines

The Energy Office of eThekwini Municipality produced a wind map. They installed wind turbines on top of the hill. The technology is purchased from the German City of Burhan. Most of the technology formed part of the KZN sustainability workshop that took place at the Durban Botanic Gardens on the 30<sup>th</sup> of March, 2011.

### Recycled and bottled Water

eThekwini residents drink recycled water that at some stage is drawn from various waste water treatment plants in the KZN Midlands. It has been established that even bottled



water is not safe to drink because there are bacteria identified in most bottled water sold by various retail outlets. The tap water is more cost effective than bottled water and also has high nitrate. eThekweni Water and Sanitation is conducting various water recycling projects in the South Durban Water Works and interested people could participate in a tour to see how the recycling takes place.

**Feasibility of supplying Free Basic Water during the Climate Change Crisis**  
eThekweni Municipality has no plans to reduce the amount of free basic water from the current 9 kilolitres they are providing due to water security and scarcity problems. The City is committed to continuing to provide 9 kilolitres of free basic water to each and every family constituted by 6 members. This is based on the view that if a basic amount of water is not provided, a number of poor households will get sick. The City will fix leaks that are in the municipal area, but those within peoples' properties remain the responsibility of the households. Participants from Hammarsdale stated that they are continuing to use water without paying and they were assisted by municipal officials to illegally connect water and electricity. Macleod indicated that contractors that supply poor products and municipal officials that assist communities to illegally connect water and electricity will be dealt with accordingly. Illegal connections, using sub-standard pipes and other material and converting urine diversion toilets into flush toilets were also reported by participants from Umzinyathi.

#### Interesting Points

- Food security issues such as better crops to grow other than maize in KZN, is interesting to report back to communities. There is a need to get assistance from Agricultural Extension Officers.
- It was a good platform to learn from each other. The difficulties that people experience with urine diversion toilets is a lesson that people living in areas with flush toilets could learn from and assist in mobilizing for better sanitation.
- Rainwater is not safe to drink instead it is the water from the tap that is safe. Rainwater harvesting is still crucial in adaptation, especially farmers could use such water for watering crops, bathing and washing. There is a need to put a filter in a rainwater harvesting tank especially if you live in areas with high levels of pollution
- Indigenous knowledge drawn from communities needs to be integrated with knowledge that scientists collect. Government and academia could learn a lot from communities, as well.
- Durban community drinks water drawn from wastewater treatment plants from Umsunduzi, whilst people from uMgungundlovu drink recycled water from Mpophomeni wastewater treatment plants. The water storage facilities are 20% less than they are supposed to be despite heavy rains experienced in January 2011.
- Residents that built houses in flood plains need to be relocated before their lives are put in more danger. There is a need to improve the quality of our rivers. Inanda Dam is an example of a water storage facility that turned green as a result of pollution.
- Most activists campaign a lot on water services and very little on water resources. We need to strengthen our campaigns in this area as well.

- The campaigns on water resources management could also include issues of river health, institutional arrangements that perpetuate impacts of climate change and water scarcity. A good example is the fact that eThekweni Municipality is no longer managing water resources as they used to do in the 1970s. They purchase bulk water from uMngeni water which charges full prices that are paid for by communities. The other related point is that Inanda dam is deteriorating with green algae visible on the Maphephetheni side and like the Hartespoort dam, may require remediation.

#### Presentation by York University Partners about what they are doing

##### Umphilo Wamanzi – Dudu Khumalo

- 4 communities were identified as case studies of community actions to tackle negative impacts of climate change.
- At Umbumbulu the focus is on how communities adapt to floods that recently took place at the beginning (January) of 2011.
- At Umzinyathi, the focus is on water saving through rain water harvesting technology.
- The focus of Piesang/Soweto is how communities downstream deal with upstream impacts on the river.
- The focus of Zamani B and surrounding areas is on the use of dry sanitation as an adaptation measure to deal with the negative impacts of climate change.
- A one day workshop is planned to take place in each of the four areas.
- Learning journeys are being planned in each of the four areas so that each of the communities can learn from each other.
- COP 17 is taking place in Durban at the end of November 2011, it will be important to involve rural women as well as traditional leaders.
- Another important event is about 40 000 CSOs that are planning to March in the City, as well as the alternative COP 17 conference, which will take place outside but during the UN COP 17.

##### South Durban Community Environmental Alliance – Lushendrie Naidu

- SDCEA's main focus is providing environmental education in schools based in Wentworth and Merebank.
- They are also engaging communities on how to grow organic food and create awareness about carbon trade.
- About 450 pupils attended a school workshop at Umlazi. Pupils were taught how to grow vegetables without using pesticides and how to engage in sustainable development practices.
- Selected members of the community will participate in the PAR workshop that is taking place on the 10<sup>th</sup> of March 2011.
- They will train children on how to save water and encourage the use of grey water in watering gardens and washing cars, change washers if it is dripping, put 2 litre bottles in a cistern to save water when flushing. Soap, such as Sunlight, diluted in

a water, is a good solution to killing insects and bacteria that one finds in a garden. It is important not to use Jick, bubble bath and other harsh detergents.

- Communities are encouraged to work together and take various initiatives.
- Restoration of river health is important especially for fisherman and this activity will include teaching people about removal of alien plants.

#### Umbumbulu

- The key challenges that the community is facing is drought, heavy rains and wind that blows away houses.
- Drought is caused by the shortage of water supply. Drought results in food shortages and diseases. The solution is to teach communities about crop rotation, drought resilient crops, and maintain constant contact with agricultural extension officers. Some of the crops that are suitable for Umbumbulu are madumbes, sweet potatoes, and cassava.
- Floods destroy crops and houses. Water and sewerage pipes are devastated during floods which can result in cholera outbreaks. It is imperative to educate people about the use of toilets instead of open defecation, educate communities about not building houses in flood plains and next to river banks where they are more vulnerable to floods.
- The rise of temperature especially during summer months negatively affects peoples' lives. To deal with heat, communities are encouraged to plant trees that could provide shade, discourage people from starting veld fires and encourage the use of compost to restore soil quality instead.
- There is common prevalence of heavy winds that destroy buildings. It is imperative to educate communities about building houses that are resilient to wind.

#### Umzinyathi

- There are many streams in the community. The biggest river is Umzinyathi, a tributary to the Umngeni River.
- The community used to drink water from various streams and the river up until the installation of water pipes in the late 1990s.
- The rivers are now polluted to the extent that refuse and alien plants are prevalent in water sources.
- There is a need to train the community on climate change because of a growing tendency of people to sell their houses and settle on the river banks.
- Community gardens are no longer benefitting the community. Inanda dam is heavily polluted from commercial farming and other commercial activities and no longer benefits the community.
- There are instances where green algae is found in grey tanks that eThekweni use to deliver water to rural communities. In this case, the claim by the municipality that the water they provide is clean is not correct.
- There was an instance where a dead dog was found in one of the grey tanks.

#### Hammarisdale

- There are urine diversion toilets, which help the community to save water. This was based on the assumption by the City that communities need to be provided with sanitation before they are provided with water supply. The difficulty with this line of thinking is that people that are provided with toilets before they are provided with water are unable to wash their hands after defecation as there are no hand washing facilities provided. Provision of sanitation facilities must go hand in hand with water supply in order to prevent the prevalence of diseases.
- There is a chronic shortage of water due to geographic areas in which certain areas are situated. Mofola, Zamani and Kwandeni areas are situated in hills which are prone to soil erosion. The local river is covered with sand and this affects the ecological flow of water. It is necessary to allow water flow to continue for the survival of our ecosystem.
- Water storage facilities such as tanks are required to deal with soil erosion. Rain water could be harvested in order to prevent soil erosion. Planting of indigenous trees could assist in addressing soil erosion.
- The usage of motor vehicles, tractors and trucks results in air pollution.
- The use of urine diversion toilets is a great success in Mpumalanga, flushing toilets waste a lot of water. The urine diversion toilet project was a great success when it was initiated, but its success was short lived due to politicisation of service delivery. The lesson that we learnt is that we need to separate party politics from development and that is one of the key success factors regarding the implementation of urine diversion toilets.
- There are health benefits of using urine diversion toilets. If households follow proper instructions of using the first chamber, closing it after three months to allow the faecal matter to decompose, it will naturally become compost.
- One of the key success factors is to create good institutional structures that could remain and be helpful to communities.

#### Piesang River / Soweto / Ntuzuma

- Piesang is a small river with community gardens, that is polluted and people throw refuse into the river.
- The area is generally a flood plain and most of the houses are leaking due to old water infrastructure and the location of natural springs where houses were built.
- Piesang River area is a wetland because the area is wet throughout the year. As a community we did everything to control the flow of water through digging trenches, constructing drains to direct the flow of water but the flow is uncontrollable.
- The VIP toilets collapsed during the floods season and solid waste got into our river system.

#### Lightning

- The prevalence of lightning is reported in all four communities and some of the adaptation strategies that people use is to cover mirrors, keep cool, unplug television and radio, avoid walking in pathways, do not follow the route that cattle use, avoid having buildings that are taller than others, don't build in area that was at some stage struck by lightning. The conclusion drawn is to educate the youth

about indigenous knowledge that assisted many generations in dealing with lightning.

#### Dates of community Workshops

- There would be one workshop organized in each of the 4 communities, two workshops were to be conducted before Easter and two after Easter.
- The Hammarsdale workshop is planned for the 24<sup>th</sup> of March 2011 and at Piesang River/ Soweto area it is planned for the 19<sup>th</sup> of March 2011.
- The dates for Umzinyathi and Umbumbulu were not set.

#### 1. Workshop 1 Notes: Ntuzuma/Piesang River - 19 March 2011

The experiences of the community of Piesang River revolves around floods, drought that destroys crops, the rise in temperatures during January of each year, it is not clear to identify seasons due to high temperatures across all seasons, even during winter. When there are heavy rains, Piesang River overflows and destroys houses that are built on the flood plain. There are a number of homes built on natural springs. House A1100 has two natural springs, one in the yard and the other one on the road, House number E45 at Mfino Walk and D593 have natural springs since the 1980s, other houses are E29, Mfino Walk, E17 Piesang / Mfino Walk, E92 Mfino Walk, E89, Mfino Walk, E763 Sichelulwazi Road. All these houses were reported to the local Councillor Mabizela and various departments of the municipality were notified and no assistance was provided. The state of the above houses is deteriorating and they are almost collapsing.

There are flush toilets in the formal settlements and VIP toilets in the informal settlements. There are households that received summons from the Clerk of the Court regarding water theft. The local Councillor did not discuss their situation with them, some of the households are already appearing before the Ntuzuma Magistrate Court. It is not clear what they are in charge for because water leaks were reported in the 1980s and the municipality did nothing in dealing with all leaks, those inside and those outside the yards. There are households that have water meters whilst others do not have water meters. A need is felt to clean rivers and overflowing bridges. The community gardeners are unable to water their crops because Piesang River is polluted and the source is from Glebe area, which is upstream. Taxi operators use the river to wash their cars. The pollution even affects the wetland and natural springs. The community gardeners clear unkept verges throughout the year as there are alien plants that grow quickly. The medicinal herbs that the community are growing consume a lot of water and that is why there is shortage of water. INK has been approached to finance community gardens, river health restoration, clearing of un-kept verges and removal of alien plants.

Yusuf Misaze presented a time trend and pointed out the following:

- In 1982 the river was in a good state. It was used for all purposes except drinking.
- In 1992 the river health began to decline.
- In 1998 stand pipes were provided and the river quality was very low.
- In 2000, the river health became worse and bridges were overflowing.

- Between 2004 and 2006 water from the river was no longer used due to the installation of house connections in most households. A lot of rubbish was thrown in the river.
- Between 2006 and 2011 the state of the river deteriorated further.

Nkululeko Nxumalo presented the map of Piesang river and highlighted the following features:

- Piesang river is situated mostly in ward 43
- There are natural springs in all the peoples' homes
- The high level of pollution is found at the ntoziphumayo Farming area
- There are bridges such as Piesang Bridge and Ezimantshini bridge

Mrs. Mbeje presented the timeline and important episodes in Ntuzuma/Soweto area

- In 1985 there was violence in the area
- In 1986 there were floods in the area and houses were washed away
- In 2004 community gardens started
- In 2005 a new bridge was constructed to help combat crime.
- In 2007 a garden was provided with the fence by the eThekweni Department of Parks and Gardens.
- In 2008 unkept verges were cleared by a local cooperative under the leadership of Paulos Gwala to combat crime. A number of people were reported dead in 2004 and the initiative assisted in preventing crime by making areas in the community more open and visible.
- In 2009 the Department of Agriculture provided the community gardeners with garden tools. The project is helping to increase food security and in growing of medicinal herbs.

## 2. Workshop 2 Notes: Mpumalanga – 24 March 2011

The workshop took place on the 24<sup>th</sup> of March 2011 at the Old Council Chambers at Mpumalanga Township. The workshop began with a presentation from Simphiwe Nojiyeza (attached) in which the following were reactions from participants regarding adaptive measures that the community of Zamani, KwaNdeni, Woodglen and neighbouring communities adopted.

The prevalence of flooding is common in Mpumalanga area. There are also strong winds that resulted in roofs of houses being blown away, furniture in households being destroyed as houses were flooded. The community leaders visited areas that were affected and assistance promised is still awaited. The rise in temperature is already being experienced by community people and it is estimated to increase to 35 and 37 degrees celcius. People are noticing unusual mosquitos and other foreign animals in the area after flooding and the community suspects that such could lead to malaria fever, which is already prevalent in Northern KwaZulu Natal.

A very strong lightning struck Mpumalanga and surrounding areas and it lasted for two days. Trees were destroyed. The quality of electricity is so poor that lightning conductors were not installed just like all other Townships. At Woodglen, heavy rains washed way

faeces from VIP and UD toilet latrines, nearby wetlands are contaminated, and the community is expecting the outbreak of waterborne diseases if the matter is not addressed immediately. It is impossible to stop water from flooding from entering UD toilets and they are supposed to be a form of dry sanitation technology. Urine diversion toilets were built in areas that are close to townships with flush toilets and this is causing tensions. UD toilets are full and emptying them is being resisted by the community, which is causing a health problem. It is suspected that the Ministry of Health was not involved in conceptualising UD toilets as a means of saving water, as they are a health hazard. The UD toilets are found in areas with VIP toilets. UD toilets were never accepted by households. It is suspected that no feasibility or acceptance study was conducted before UD toilets were introduced as the level of acceptance is very low. The following are some of the voices:

“I was a member of the Steering Committee that was responsible for linking the community with the project management team, the community complained to the extent that the Chairperson of the Council responsible for water, Councillor Khuzwayo even came to Mpumalanga to intimidate members of the community that rejected UD toilets. He threatened us that if we do not accept UD toilets, all projects earmarked for this area will be taken out of the Integrated Development Plan. He even threatened to relocate the project to Gqumeni if we continue to reject UD toilets just like the community of WoodGlen.” according to Mr. Hadebe.

“The voices of the community is not allowed in project implementation and that is why we demolished UD toilets because we were never consulted prior to their installation. Even when we rejected UD toilets, eThekweni continued to build them, hence they are lying unused. No research was conducted on the impact of using UD toilets on women, children and people with disabilities. At Zamani people with disabilities requested bigger toilets, but project managers refused despite the fact that bigger toilets were built at WoodGlen to accommodate people with disabilities. This came after people demolished their UD as a symbol of rejecting this technology that eThekweni municipality imposed on us.”

The project of the Department of Cooperative Governance through which lightning conductors are installed has not reached Mpumalanga despite KZN being earmarked as one of the provinces that are prone to lightning. Government is required to build the capacity of the communities to adapt to lightning, besides provision of lightning conductors. Such capacity building could involve the training of community leaders in helping with adaptation to climate change. There are children that were struck by lightning at Mpumalanga and it is not clear how this could be dealt with. Others believe that it is caused by witchcraft and this may turn people against each other.

There is a gap in the knowledge between scientists that links lightning to precipitation and other natural phenomena and the indigenous knowledge that links it to witchcraft. Examples of witchcraft related lightning was the one that struck the sport field and competing teams were suspected as caused because it struck the soccer field only. Other people associated lightning with the death of a prominent witchcraft/wizard, most people

believed that the burial of Vimbeni Shembe of the Nazareth Baptist Church was accompanied by lightning and heavy rains. There is also a belief that a snake could cause flooding, as well lightning.

Areas that are situated in low areas are frequently affected by lightning. There is a feeling that indigenous knowledge about lightning is suppressed by the government and it is not documented by even tertiary institutions despite being useful in communities in adapting to climate change. In rural areas, households have various coping skills to deal with lightning. Some of the coping skills involve not walking on a path when there is a thunderstorm, covering mirrors, harvesting stones from thunderstorms, staying cool, avoiding walking in groups, and staying away from areas that were struck by lightning before. Sportsmen and women need to be targeted as they sometimes participate in sports even if there is lightning and therefore need sensitisation. There is a general feeling that decision makers need to be trained in helping communities deal with lightning.

Mpumalanga residents did not receive summons for illegally connecting water, despite the fact that the culture of non-payment is a well known fact even in municipal circles. Municipal officials are known to be assisting members of the community in illegally connecting water and electricity and that could be the reason illegal connections are not dealt with by the municipality. The reason for illegal reconnections is that households were provided with houses but neither water and sanitation nor electricity was installed. Even councillors and officials are aware that illegal connections of electricity and water is a culture at Mpumalanga. The high level of unemployment in the area is cited as one of the reasons that illegal connections has become a lucrative business. There are also a record of houses that are completed on paper and in practice they were never even constructed. Even households that are indigent are not provided with information they could use to apply for exemptions by either councillors or officials.

There is a lot of water wastage in peoples' yards as some of the households are unable to pay for private plumbers and the municipality is not taking any responsibility regarding leaks within yards of the households. There is a need for the municipality to review a bylaw that prevents it from fixing leaks within the yards of households. If the municipality is serious about fixing leaks and saving water, there is a need for a project to assist poor households to fix the leaks within their yards as part of indigent policy. This could be a good opportunity to develop skills in plumbing that are lacking in Mpumalanga. For every project that requires hiring local plumbers, Mpumalanga relies on getting skills outside the township, because there are no local plumbers in the area. There are houses that are built using asbestos which is suspected to cause diseases and air pollution.

Venn Diagram presentation by Sibusiso Nkomo

The group chose health as an adaptation strategy. The community structures that are related to health are community care workers that work hand in hand with the Departments of Education, Social Development, churches, schools, sporting bodies and councillors. Other structures that play an important role are ANC Youth and Women's Leagues, Community Police Forum, ANC Veteran's League, and the South African



National Civics Organization (SANCO). The amenities that are required for people to live healthily are water supply, adequate sanitation, electricity, good roads and proper human settlements and not shacks. The political structures will be targeted for training and empowerment because they take decisions that have an impact on climate change adaptation.

Timeline of UD toilets presented by Nhlanhla Vezi

The UD toilets were introduced in January 2006. The structures were established to support the implementation of the project. Structures established included the technical management committee (TMC), facilitators, caretakers, site managers, the project steering committee (PSC) and were identified in community meetings. In June 2006, the project implementation commenced. People started to use them as store rooms. Some UD toilets collapsed during heavy rains and due to poor construction. The community was not happy about the introduction of UDs. There were no hand washing facilities that were constructed and therefore they were not healthy. There was a lack of inspection by both health and construction inspectors in all stages of the project. UDs construction resulted in pollution of the air from the odour. The UDs that were constructed were small and did not cater for people with disabilities especially those using wheel chairs. The cut off date to complete the construction of UD toilets was supposed to be November of 2009, but most of the construction only completed in 2011. The clerk of work did not do his or her job as a municipal official. Clerks of work were supposed to approve all toilets constructed, but they even approved toilets that were not in line with building standards and material that is not in line with South African Bureau of Standards. There was either no concrete or they did not comply with specifications, regarding how many bags of cement to use, size of stones to mix with sand, etc.

The Time Trend presented by Puleng Makateng

Mpumalanga Township was established in 1960 and the lifestyle was good in those days. Seasons were normal. In 1985 and 1987 there were floods that resulted in houses developing cracks, graves were destroyed, and roads were devastated. Between 1990 and 1996 the lifestyle was beginning to deteriorate due to industrialisation. Most of the households were developing sinus infections due to exposure to air pollution. Food and mouth disease affected cattle in the rural areas. Between 2000 and 2006 the reconstruction and development programme (RDP) houses were constructed. In 2006, UD toilets were constructed to save water in rural areas, which worsened pollution. UDs were also constructed to deal with the problem of population increase and shortage of amenities. The lifestyle of people dropped below standards.

Community Mapping presented by Ntilo and Siyabonga Mvelase

WoodGlen was used as a case study because they have a mixture of ventilated improved pit latrines (VIP) and UD toilets. The VIP and traditional latrines was mostly used by households during the apartheid era. UDs and community standpipes were not preferred by the community because of pollution they caused. During floods, effluents from UD toilets, VIP and traditional latrines were discharged next to the Primary school and children were affected by the terrible smell. The standpipes bring a lot of mosquitos and some people leave taps open. There is a wetland situated next to Vinah Road. The

wetland is now inhabited by mosquitos due to standpipes whose taps are left open and water overflows. When UD toilets were introduced at Woodglen there was resistance from the community. Households who were members of Inkatha Freedom Party destroyed their UD toilets because they felt that the ANC is building substandard toilets in their area. ANC supports joined the IFP in demolishing their UD toilets. It is not only the UDs that were destroyed, but VIP toilets that were constructed during the tenure of Meshack Hadebe as a mayor of Outer West local council. Participants pride themselves of destroying both UD toilets and VIP toilets and Woodglen is a site of the struggle that combined members of the ANC and the IFP.

The concern that residents raise about VIP toilets is that initially they were emptied by government and since the introduction of UD toilets at WoodGlen, eThekwini shifted its responsibility of emptying toilets to communities. People prefer VIP toilets and they use UDs as store rooms. The standard of development is deteriorating in Mpumalanga. Blocking of sewerage pipes which never happened during apartheid is now worse. There is a need for ward committees to be democratically elected rather than being imposed by ward councillors on the communities. There is no manner in which UD toilets could be used properly and they need to be abolished as a technology in South Africa. Ethekwini could in the interim either empty UD toilets or simply build flush toilets. There is a need for proper consultation before toilets are constructed. Illegal connections are routed in the municipal systems of constructing houses without associated amenities such as water, electricity, and sanitation. There is a general feeling that suing communities for illegal connections is not a solution to the on-going climate change crisis that eThekwini water and sanitation department believes can be addressed by water saving and credit control. The situation will be worse as people that could loose properties through litigation might require psychological counselling. Instead, the municipality must face trial for bringing about improper development that is unsustainable and they should be help accountable. Illegal connections result in discharging of faeces from broken and blocked sewerage pipes into neighbours' properties and the municipal workers are responsible for perpetuating this by accepting bribes to illegally connect water and sewers.

The community needs to hold elected councillors accountable and ensure that they consult households and report back regarding decisions taken by Council. Regarding COP17, Mpumalanga residents will put pressure on the Department of Environment, eThekwini Executive Committee and other stakeholders in ensuring that heads of states meeting in Durban come up with tangible mitigation and adaptation agreements. If they fail, the community will have no other alternative than to protest until an agreement is reached. Mpumalanga residents wish to link up with institutions promoting green jobs, their suggestions include VIP emptying, protection of wetlands and combating malaria and other water-borne diseases. Other green jobs could be created for flood attenuation, given the fact that coffins and rugs washed away during the 1986 floods were seen lying around and such disasters should be prevented. Green jobs could also be created to improve our drainage systems, given that during the 1986 floods about 50 houses were washed away because water mains were not provided.

The projects that eThekweni Climate Protection Department is promoting, such as ploughing climate resilient plants could also become a source of green jobs, but governments need to provide households with fences in order to prevent livestock from destroying crops in community gardens. Creation of camps to keep livestock so that they do not destroy vegetable gardens could also be another source of green jobs.

### 3. Workshop 3 notes: Mzinyathi - 10 April 2011 (amaQadi Traditional Court)

Simphiwe Nojiyeza presented an overview of climate change impacts in KZN and Durban (See attached powerpoint) and the following are reflections from community members that were present (as per the attached attendance register).

The climate change impacts that community members are beginning to see is drought and delays in the start of the rainy season, death of people due to lightning, and the fear that such attacks could be repeated. Rivers which are sources of drip irrigation are running dry. There is already a chronic shortage of water supply caused by the failure of the municipality to ensure that there is continuous availability of water. The water taps were dry during the day in which the workshop was held and the nearby water reservoir at eThelezini near eKukhanyeni has been without a drop of water for almost a year. The pipes in peoples' yards were broken and leaking and broken pipes were not only in household yards, but as well in areas under municipal jurisdiction. People are either not reporting the leaks or the municipality is not prepared to fix the leaks. The leaks also result in some areas degenerating into ponds that can attract mosquitos.

A number of concerns were raised regarding lack of access to water supply and adequate sanitation. One participant noted "I am from Matata where the ward councillor resides, the boundary or waterborne edge is next to where I live, pipes were constructed, but there is no functional water supply, we still drink water from natural springs that might be polluted. I even spoke to the ward councillor Magubane regarding this, and her response was that the provision of water pipes and taps need to be completed at Ngonweni before connections are done at Matata. Even at Khusane they do not have water despite the fact that a water reservoir is complete". Lack of services is also one of the concerns that the community raised. aMaQadi are strategically situated next to well established areas and should be ahead when it comes to developmental issues, but lack of services is caused by politicians that only render state services to their fellow party comrades and discriminate those who do not belong to their political parties. The rights of citizens to access water and sanitation and to live in an environment that is not harmful to their wellbeing is violated and not respected. Most of the councillors that are elected do not live in the areas they are responsible for. The municipality was planning an open day in which various departments would talk about their services and members of the community were not informed. The meeting was planned to take place at Small Enterprise Development Agency offices on the 12<sup>th</sup> of April 2011.

Wetlands are not protected and the Qadi Traditional Authority is allowing households to build houses in wetlands, which results in houses collapsing and the shortage of water for drip irrigation experienced by subsistence farmers. Natural forests as well as natural

springs are also not protected. Some of the natural herbs that people used for many years to heal diseases are being destroyed. There is a feeling that government lacks a long-term vision of protecting natural resources and sustainable development. Government is unable to project the likelihood of what might happen in 2020 due to lack of vision and strategies.

Induna Maphumulo expressed appreciation to UKZN and Umphilo WaManzi for the educational workshop and also appreciated the role played by Mr. Myeza, the chairperson of the Qadi Farmers Association for ensuring that farmers attend the workshop and condemned the Traditional Authority for not informing people about this very important workshop. The development agenda in rural areas is questionable because households were recently allocated land under the electricity lines. At Khusane, lightning struck and electricity is not operating since that thunderstorm. Houses situated next to the road from KwaMthethwa leading up to Khusane were all affected by lightning and the government did nothing to support these people.

Mr. Myeza presented the Map of AmaQadi

In the map, he was showing the main road from Durban that leads to Ndwedwe via Ngonweni. There is a shopping complex at Seme Store where farmers meet. The first turn left from Seme store leads to Esikebheni where an agricultural project supported by the KZN department of Agriculture and Rural Development is situated. There is a poultry project based at Umkhumbane, 4 vegetable gardens and another vegetable project situated along the road leading towards Amatata. At Vusukukhayanya School, few metres away from Seme Store there 3 agricultural projects, the first one is at Matikwe and 2 additional projects are situated at KwaMthethwa. There is a wetland situated at Matikwe which 1.5 metres deep and eThekweni Municipality is planning to build a shopping mall in the vicinity of this wetland. There are 7 known wetlands in the area and the wetland situated next to Eshowe Forests was sold to commercial farmers and the subsistence farmers that originally used it are no longer allowed as it is now commercial property. It is not clear whether the Department of Water Affairs granted the commercial farmers a license to extract water from this wetland and also whether they are paying for the extraction of water as they are using such as resource for commercial purposes.

People were allowed to build houses in a wetland situated at KwaMthethwa. The area is administered by Izinduna Mabala Ngcobo and Nxumalo and it is not clear who among the two headmen allocated this land for building homes. The houses are beginning to collapse. It is not only the Traditional Authority that allocate land in wetlands or flood plains, even eThekweni Electricity Department built an electric power station within 100 metres away from Umzinyathi River, which was flooded twice in 1984 and 1987. There are houses that were constructed on the bank of Umzinyathi river within 50 metres radius that was devastated heavily by the 1984 and 1987 floods respectively. There were participants that testified that they at least have relatives and people they know very well that built their houses on a wetland in areas such as KwaNtabende.

The timeline of AmaQadi was presented by Siphso Dlamini

In 1975, there were heavy rains that led to the destruction of bridges and buildings. In 1980 there was a lot of drought and those that had livestock were forced to look for alternative grazing land. In 1986, about 1043 households were displaced when the Department of Development Aid constructed Inanda dam. There was also a lot of violence that displaced many of the households that were not affected by the construction of Inanda dam. In 1990 very good rains were observed and went hand in hand with the release of Nelson Mandela. In 1998 there were heavy rains and in 2009 rain was scarce and drought came again. The temperature was estimated to be about between 34 and 36 degrees Celcius. At the end of 2010 and beginning of 2011, there were heavy rains that destroyed houses and public spaces.

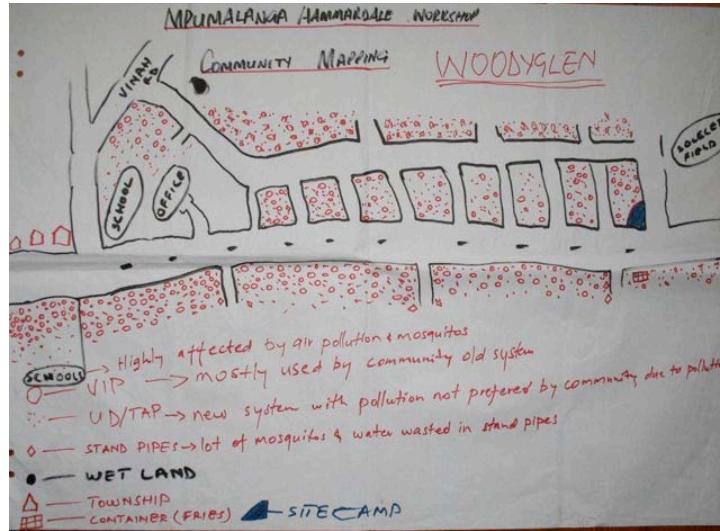
## APPENDIX I

### Umphilo waManzi - Workshop Register Participatory Local Assessment Workshops Water and Climate Change Impacts

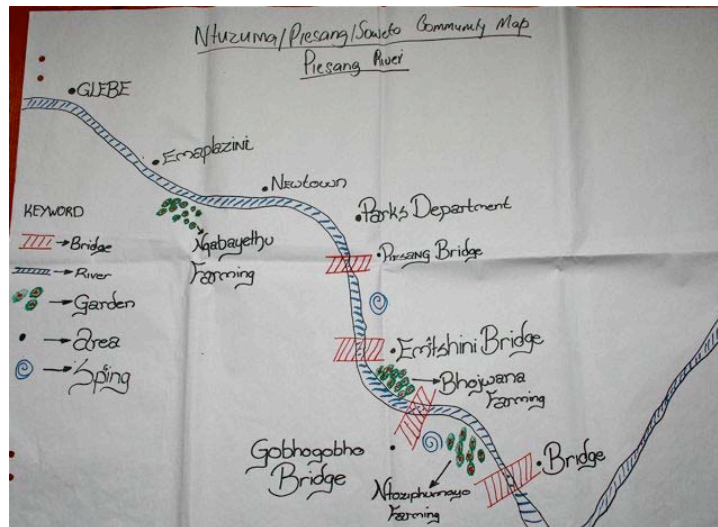
Date	Community	Attendance
March 9-10, 2011	<i>Day 1:</i> Stakeholder Meeting          <i>Day 2:</i> PAR Training	<i>Day 1:</i> 19 (including 2 traditional leaders) + 2 from municipal government (Head of eThekweni Water & Sanitation and rep. from Env. Planning and Climate Protection Department)          <i>Day 2:</i> 17 participants
March 19, 2011	Ntuzuma/Piesang River	21 participants
March 24, 2011	Mpumalanga/Hammarsdale	
April 10, 2011	Mzinyathi	
July 28, 2011	Mbumbulu	19 (including 4 traditional leaders)

## APPENDIX J

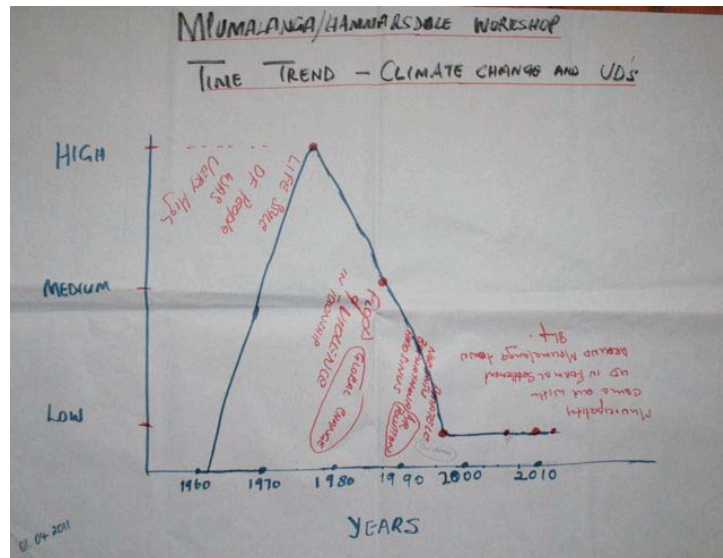
### Photos from Umphilo waManzi Community Workshop in Mbumbulu July 28, 2011



Mpumalanga Map



Ntuzuma Map



Mpumalanga Time Trend



Creating Timelines



Creating Maps



Creating Time Trends



**APPENDIX K**  
**South Durban Community Environmental Alliance (SDCEA)**  
**REPORT, 12<sup>TH</sup> MAY 2011**

In the build up to the workshops focusing on strategizing, lobbying and mobilizing, various meetings were held at different locations. These included meetings that were held in Clairwood on the 6<sup>th</sup> April 2011 and one in Wentworth on the 13<sup>th</sup> April 2011.

COP 16 Review and COP 17 Strategic Planning Workshop Report, 16<sup>th</sup> April 2011

On the 16<sup>th</sup> April 2011, the SDCEA hosted a COP 16 Review and COP 17 Strategic Planning workshop which was used as a platform to bring together people from all backgrounds and communities to discuss mobilization and actions to be taken during the COP 17 negotiations to be held in November and December in Durban.

This event spoke to all communities and organizations concerned with the effects of climate change on the environment and more especially what this would mean for peoples livelihoods.

People came from areas like Merebank, Clairwood, Isipingo, Wentworth, Umlazi, Folweni and Chatsworth to take part in an event that would have an impact in the social movement in Durban at the United Nations Framework Convention on Climate Change. The idea behind this event was to bring together ideas, share information, mobilize and strengthen partnerships between communities, organizations and individuals on climate change.

The day began with an introduction to the day's agenda and the purpose of this workshop, which included a look back at COP 15 and COP 16 and what can be anticipated for COP 17. Ferrial Adam from Earthlife Africa, Johannesburg presented her personal take on the process that unfolded at these COP events, a look at what worked and what didn't work. It is predicted that most resources in Durban and surrounding areas will be affected where people's livelihoods will be destroyed like the subsistence fisherman and farmers. COP 15 spelt disaster for developing countries like South Africa as the Copenhagen Accord that was signed on the very last day of the conference was a non-binding agreement with only a few countries as signatories. Cancun in Mexico, which was the host city for COP 16 was targeted as the city that would provide hope for developing countries around the world. This however did not live up to its full expectation and now all eyes were set on Durban for COP 17.

Water, which is seen as the most valuable resource for life, will be severely compromised in the near future where people may not have access to water leading to worldwide devastation. Bryan Ashe from Geosphere highlighted the ways in which this water resource could be affected through a well-articulated presentation. Wally Menne was the next presenter who focused on strategies that his organization is currently involved with regards to COP 17 actions. Bobby Peek from groundwork rounded up the morning session with a keen take on energy and what does this mean for an energy intensive

economy like South Africa. With plans to build the world's 3<sup>rd</sup> and 4<sup>th</sup> largest coal fired power stations, climate change is certainly on the minds of the future generations.

Thereafter, there were discussions that took place in groups, which were themed water, energy and global day of action plans. Outcomes of the discussions:

### Water

- Conserve rainwater: water tanks, preservation of grey water, use of water bottle @ schools, use of soak pits, dual flush systems.
- Recycle household water. Industries also should use recycled water. Use of shower instead of a bath of water. Don't let the tap run when brushing our teeth. Bucket for washing cars. Fix leaky yaps and over flowing systems. Boil sufficient water as required for 1 cup of tea, coffee etc. Collect cold water in a bucket whilst waiting for the hot water to flow through.

### Energy

Issues that are affecting communities:

- Cut-off's without notice
- No free basic electricity
- No electricity in Copesville
- Illegal connections (unsafe to children)
- No budget for electricity for any form of energy supply

### Solutions

- Renewable energy -solar geyser – solar panels
- Local government elections to highlight plight of marginalized communities

### Global Day of Action plans, 3<sup>rd</sup> December 2011

- Awareness – how can awareness be created? This can be done through links such as:
  - Facebook
  - Local Media
  - Print
  - Radio
  - Website
  - The green revolution community group
- Accommodation – finding suitable accommodation for people that will be attending. Compiling a database that people can easily refer to, such as the university residences.

- Assistance & Health – this can be facilitated through volunteers who can be strategically placed at airports to guide people.

The afternoon session laid the foundation for ways in which preparation has begun for COP 17. Siziwe Khanyile from groundwork pointed out the strategies of the C17 committee, how mobilization of civil society shape up in the next few months, strategy building inside and outside of the conference and the opportunities found within for communities. Bryan Ashe together with Desmond D'Sa (SDCEA) communicated the alternative space that is being planned for the 2 weeklong conference. Community discussions then ensued with groups themed with alternative space for COP 17 and mobilization.

#### Alternative space for COP 17 conference

- Volunteers – there is a need for volunteers who can offer support.
- Guides – this can be conducted by tertiary students, lecturers or school students. The skills required will include:
  - PRO's
  - Administrator assistants
  - Child care assistants
- Entertainment – cleverly planned skits and plays making a visual impact of the devastation that will be experienced by poor and marginalized communities. Community groups as well as secondary schools have indicated their willingness to get involved to provide some of this entertainment.
- Media championing – this can be done through electronic and print media.

#### Mobilization

- Workshops – these should be carried out at local levels where specific languages should be used that people can identify with.
- Curriculum – climate change should be included in the school's curriculum so that education and awareness begins at an early stage.
- Media – through social networking sites like Facebook and Twitter