

**\*Title:** Participatory Action Adaptation: Tools for increasing climate change capacity and preparedness at the local government level

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**\*Abstract:**

This project addresses knowledge, resource, capacity and networking gaps on the theme: 'Strengthening urban governments in planning adaptation.'

The main objective of this project is to develop an adaptation framework for managing the increased risk to African local government and their communities due to climate change impact. The ultimate beneficiaries of this project will be African local governments and their communities. The guiding and well-tested ICLEI principle of locally designed and owned projects for the global common good, specifically in a developing world context, will be applied throughout project design, inception and delivery.

Additionally, the research will test the theory that the most vulnerable living and working in different geographical, climatic and ecosystem zones will be impacted differently and as such, will require a different set of actions to be taken. Potential commonalities will be sought towards regional participatory learning and wider applicability. The five urban centres chosen for this study, based on selection criteria, include: Cape Town, South Africa, Dar es Salaam, Tanzania; Maputo, Mozambique; Windhoek, Namibia; and Port St. Louis, Mauritius.

Through a participatory process, this project will carry out a desk-top study, long-term, multi-discipline, multi-sectoral stakeholder platforms in five Southern African cities comprising of academics, communities and the local government in order to facilitate knowledge-sharing, promote proactive climate adaptation and resource opportunities available for African cities, develop five tailor-made Adaptation Frameworks and explore regional applicability. A network of stakeholders within each urban centre will be established, feeding into a larger regional network of local authorities and partners in Sub-Saharan Africa, and globally through existing ICLEI global (e.g. the ICLEI Cities for Climate Protection programme), ICLEI Africa and UCLG-A members and networks, ensuring global best practice, roll-out, and long-term sustainability.

**Key words:** Adaptation, Africa, Climate Change, Local Governments, Participatory Action Research, Policy.

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**Session title: Urban vulnerability assessments in developing countries: Lessons from tool makers and field testers**

**Presentation title: Participatory Action Adaptation: Tools for increasing climate change capacity and preparedness at the local government level**

### **Abstract:**

Climate change is expected to have severe physical, social, environmental and economic impacts on cities worldwide, both directly and indirectly. These impacts are expected to have a disproportionate effect on those living in poverty in developing countries, particularly Africa.

In July 2009, ICLEI Africa Secretariat initiated the Five City Adaptation Network project. Already the project is providing some useful and insightful information on the current understanding and experiences of the threats associated with climate change, adaptation, and climatic data resources available in Southern Africa. Due to the variety of respective governance and decision making processes of the cities, the project utilizes a number of entry points (i.e. different sectors or departments) in order to ensure that the project is aligned to areas that are prioritized by the cities and where projects of similar nature are already underway. The use of these tools has assisted and improved the interaction with the various key stakeholders around the topic of climate change and adaptation, whilst moving towards enhancing engagement and holistic decision making processes covering: climatic risks, sectoral linkages and the development of locally appropriate adaptation mechanisms. Through this project, a number of mechanisms and tools have been developed to understand the risks, impacts and vulnerabilities at the local level, and to prioritize the climatic variable/s that is/are currently impacting the city services, infrastructure and reliability as service providers (i.e. infrastructure, day to day service delivery and livelihoods of the local population). This paper describes some of the tools that have been recently developed by the ICLEI Africa team and are being used in Southern Africa to develop and increase capacity around the terms and complexities pertaining to climate change. These tools will also enable the identification of local climatic risks and locally appropriate adaptation options that are likely to increase the resilience of African local governments and communities.

### **Keywords:**

Adaptation, Southern Africa, climate change, key-stakeholder, tool

### **Introduction**

Significant uncertainties remain concerning the exact magnitude, rate and geographical impact of climate change. Despite this, there is strong evidence in current literature and climatic measurements to demonstrate that, as a result of increasing greenhouse gas emissions, atmospheric and sea surface temperatures are rising.

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Africa covers more than one fifth of the Earth's total land area and it is the second largest continent, with one billion people as of 2009 (UN 2006). Although it has abundant natural resources, it remains the most underdeveloped continent globally. Extreme poverty, uncoordinated governance, poor access to water, sanitation and health services and malnutrition from inadequate food supplies threaten to slow Africa's progress (State of Africa Cities 2010). Despite Africa's negligible contribution to greenhouse gas emissions (IPCC 2007), the average sub-Saharan African will bear a three-fold population-based risk of suffering adverse effects of climate change when compared to the global total (Byass 2009). The Stern Report concludes that, 'the poorest will be hit earliest and most severely. In many developing countries, even small amounts of warming will lead to decline in agricultural production because crops are already close to critical temperature thresholds. The human consequences will be most serious and widespread in sub-Saharan Africa, 'where millions more will die from malnutrition, diarrhea, malaria and dengue fever, unless effective control measures are in place' (Stern 2006, 84).

Africa is particularly vulnerable to climate change and associated climate variability as the situation is aggravated by the interactions of 'multiple stresses'. These 'multiple stresses' include: endemic poverty; complex governance and institutional dimensions; limited access to capital (including markets, infrastructure and technology); ecosystem degradation; and complex disasters and conflicts. In turn, these stresses have contributed to Africa's weak adaptive capacity, leaving the continent most vulnerable to deal with impending changes (IPCC 2007).

### **Sub-Saharan Africa project: Addressing climate change adaptation**

ICLEI Africa's adaptation project entitled 'Sub Saharan African Cities: A Five-City Network to Pioneer Climate Adaptation through Participatory Research and Local Action' program was initiated in July 2009. This initiative is funded jointly by the International Development Research Centre (IDRC), Canada, and the Department for International Development (DFID), UK, under a research and capacity building development program called the Climate Change Adaptation in Africa (CCAA) program. This transboundary initiative aims to address the gaps in knowledge, resource, capacity and networks in five southern African cities by strengthening their ability to plan for, and adapt to, the impacts associated with climate change.

The project utilizes various entry points within each of the cities (to ensure alignment with the city-specific priorities and local governance processes) for the project, whilst using a number of useful tools and case studies, to highlight the impacts, sectoral linkages and adaptation strategies associated with climate change which are being addressed in the southern Africa region. Cities participating in this research include Walvis Bay in Namibia, Cape Town in South Africa, Maputo in Mozambique, Dar es Salaam in Tanzania and Port Louis in Mauritius. The projected climatic changes and climate variable trends, specific to the region are presented and discussed within the five baseline studies (that identify potential climate-variable specific threats to infrastructure and services) for each of the cities in combination with a regional climate systems analysis report. This has been deemed to be an important process that capacitates stakeholders in understanding the links between physical changes in the regional climate system, thus assisting in offering a way to reconcile observed trends and future projected changes where they differ.

Local governments, as the sphere of government closest to their constituents, are required to make decisions and set directions for promoting social, cultural, environmental and economic well-being.

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Extreme climatic events and variability impact local governments and the day-to-day activities and services that they provide to their communities. Subsequently, climate risk and vulnerability need to be strategically managed to ensure resiliency.

## **Methodology of climate change adaptation: Tools for the African context**

### **Introduction to tools:**

Throughout the project a number of mechanisms and tools have been created by ICLEI Africa Secretariat to develop, build upon, and strengthen the capacity to adapt to climate change, particularly when it comes to understanding the risks, impacts and vulnerabilities at the local level. Combined, these interactions enable the key local stakeholders to engage in discussions and thus allow for the prioritization and identification of the climatic variable/s that is/are currently impacting the city the most ( i.e. infrastructure, day to day service delivery and livelihoods of the local population) .

Two tools have been developed for this purpose including: the Interactive Climate Change and Climate Impact Training Tool (ICCCI Tool), and the Local Interactive Climate Change Risk and Adaptation Prioritization Training Tool (Local RAP tool). The second of which is separated into two parts respectively: Part I: Risk Prioritization and Part II: Adaptation mechanism identification. Both tools assist in providing direction and focus towards increasing adaption capacity, in a relatively short period of time, at the local government level. These participatory action research tools encourage and promote discussion and dialogue across multi-faceted, multi-disciplinary and multi-sectoral stakeholders, to engage with each other on and around climate change and adaptation. The methodologies of the two tools are discussed in the next sections.

### **a. Interactive climate change and climate impact training tool (ICCCI Tool)**

The aim of the ICCCI tool is to assist key stakeholders at the local level (i.e. representatives of local governments, businesses, communities spanning a wide demographic range, rate payers, NGOs, CBOs etc.) to: a) understand the concept of climate change, b) become familiar with the terminology used, and c) to comprehend the impacts that are projected to occur in relation to the climatic variables (flash floods, sea level rise, wind speed, etc.).The tool uses pictures and images of the planet Earth and its atmosphere to describe climate change, with a particular focus on the anthropogenic influences that are contributing to greenhouse gas emissions and the phenomena known as global warming (Figure 1). This is further simplified to the local government jurisdiction. For clarity purposes, local examples are given in conjunction with the tool during capacity building events (i.e. the changing of the local climates that are often associated with deforestation, etc.) and thus enhancing the discussions pertaining to current scientific projections.

This tool can be used in a number of situations:

1. This tool is a ‘capacity and understanding’ building tool that can be used by any individual (who has some prior knowledge of climate change) to communicate, educate and increase awareness of climate change in its entirety (at the global and local levels) through understanding of the global processes and that there are in fact no geographical boundaries when considering climate change.
2. In the interests of developing strategies and plans at the local government level and enhancing the adaptive capacity of the local communities through increasing knowledge (even if only to educate them about the potential threats they may be facing).

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3. This tool should be used upon entering into interaction with key stakeholders at the local level. Dependent on the audience present, the terminology used can be raised and simplified to enable access and understanding of the complexities surrounding climate change.

#### **b. Local interactive climate change risk and adaptation prioritization training tool (Local RAP tool)**

The aim of this tool is to assist key stakeholders at the local level to prioritize which climatic variables they consider themselves to be the most vulnerable too. A participatory process is then undertaken, whereby adaptation options are shared (in card format and with verbal description), discussed, and considered for decisive action. The tool allows for the climatic threat, per climatic variable, to be discussed and unpacked at a very basic level. This is to ensure that all participants are on the same page, whilst identifying and deciding upon which of the climatic variables, and their associated threats, are considered to be of priority. Figure 2 illustrates key stakeholder discussing amongst the group the impacts associated with drought, the prioritized variable. Subsequently the process moves on toward the identification and prioritization of locally specific adaption options.

The first component of this tool assists local governments and other key stakeholders, that fall within their jurisdictions, to prioritize (given the perceived and experienced climatic threats associated) which climate variables, such as sea level rise (permanent and impermanent) and changing rainfall and precipitation patterns, are considered to represent the greatest risk to the present area (see Figure 3). This part of the tool aims to enhance and encourage interactive discussions around the variables that are considered to be a threat and thus provide direction for the second part of the tool.

The second part of the tool is geared towards driving the initial processes that have been previously presented, whilst encouraging open discussion and further interaction. The tool moves toward understanding how climate change variables are likely to manifest themselves in the physical sense (i.e. flooding, drought and sea level rise). The intent, as described by the facilitator, is to encourage forethought towards the identification of suitable and locally appropriate adaptation options whilst considering the local context. Such processes therefore include the identification and prioritization of climate variables (and their associated impacts) which are considered to be exerting the most pressure upon the day-to-day activities of governmental services and infrastructure, the communities and the businesses that fall within the jurisdiction of the local authority.

This part of the tool requires the facilitator to explain and identify, with the aid of the participants, adaptation options that fall into the following categories:

- Community based adaptation options (i.e. community owned actions)
- Institutional adaptation options (i.e. institutional arrangements and governance practices)
- Biophysical adaptation options (i.e. the use of natural, soft, bio-diverse and eco-systemic measures)
- Infrastructural adaptation options
- And finally, the possibility of preparing a managed retreat

The following two images illustrates this process whereby participants are grouped into smaller interactive discussion groups, to discuss and identify the most suitable locally appropriate adaptation options from the above categories, that is thought to increase resilience within the given area (Figure 4).

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A representative from each discussion group is then required to feedback on the selected adaptation options for the specific prioritized climatic variable, which enables the rest of the participants to intervene and prioritize most necessary steps towards climate resilience (Figure 5).

These options are then incorporated within the risk/cost/benefit matrices (varying methodologies are used) from where informed decisions and directions can be agreed upon as the next implementation steps.

This tool can be used in a number of situations:

1. To assist local governments and key stakeholders to prioritize areas of focus for action, in terms of climate change (part one). The methodology used ensures that this is an open and transparent process, whilst encouraging open dialogue between all involved.
2. The second part of the tool elaborates upon this, provides a number of adaptation options (from a sectoral perspective), catalyses discussions and initiates decisions around which adaptation options are applicable in the given local context. Please note that there may be other options that have already been identified and applied at the local level which should, if appropriate, be included for future use.
3. This tool can be used with variety of stakeholders and should not be used in isolation, as the results from this should then be further analyzed and tested for appropriateness using methodologies, such as the cost/risk/benefit matrices, prior to providing direct advice and steps forward.

## **Benefits and Conclusion**

The tools were initially developed to increase and enhance capacity and knowledge on climate change and thus increase preparedness through participatory research and local action of African local government officials and key stakeholders. Images, illustrations and the use of local examples when using the tool, assists in overcoming language barriers from a broad multilingual African continent. The tools encourage and enhance open interaction and discussion amongst participants; drawing cumulative knowledge pertaining to climatic changes, impacts associated with climate variables and adaptive actions considered most valuable from elderly community members with vast experiences.

The use of the ICCCI and Local RAP tools described above provides an ideal medium for local multi-stakeholder interactions regardless of age, gender and wealth status thus enabling ICLEI team members to obtain information from all aspects and dynamics within a participating city. The tools are flexible and can therefore be adapted to address climate vulnerabilities pertinent to a city respective of magnitude and socio-economic factors within the local context. Technical aspects of the tools are easily adjustable dependent upon the audience and level of participant. The language at which the tool is pitched can be simplified to reach an audience that is unfamiliar with the topic, such as urban communities. More technical language can be used when undertaking these activities with informed/educated key stakeholders, allowing a broader and deeper understanding of the complexities and uncertainties related to climatic variability and climatic projections at the local level. These technical flexibilities allow all participants from a variety of backgrounds to actively participate and to reflect on local experiences from past and current events and any (if appropriate) gradual climatic changes.

Past personal experiences described by individual stakeholders and/or organizations have indicated that the tool encourages the development of thought processes between a variety of stakeholders.

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Discussions are created when participants present on impacts associated with their prioritized climatic variable. The impacts identified often link to direct and indirect (i.e. knock on affects) impacts that are associated with a single climatic event such as socio-economic, political or environmental facets, which allude to community vulnerability and disrupt the sustainability of livelihoods.

The valuable anecdotal and indigenous knowledge is then captured for consideration during the development and formulation of a tailor-made adaptation framework appropriate in the local context This will provide necessary steps for increasing adaptive capacity and additionally will lay the groundwork for the participating city and other key stakeholders (i.e. businesses, community members and researchers from a range of disciplines) to implement smart climate actions toward increasing climate resilience.

The tools and workshop aides have been successfully utilized across cities and local governments in southern Africa in a number of different languages and have consistently proven, to be very useful in terms of capacity building and inciting discussions around pertinent climate related issues in the local context. The tools have also proven to be robust enough so as to ensure climate change can be presented at many different levels without distorting the message or compromising on the valuable outcomes. Use of the tools have also simplified the notion of climate change from an abstract and complex idea to something that is easily accessible and understood by civil society in order for key stakeholders and community members to take ownership of actions towards increasing resilience to climatic events. Stewardship is instilled at all levels (i.e. from community members to decision makers). These key stakeholders actively contributed towards the formulation of locally appropriate adaptation frameworks through undertaking the tools step-by-step processes and then are able to pass on good practices to peers and younger generations to sustain and build-upon the knowledge learnt.

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Currently the Climate and Disaster Risk Reduction Manager for ICLEI Africa, whilst also fulfilling the role of the ICLEI Global South Co-ordinator. Lucinda holds a Masters in Science and has been working within the Adaptation Arena in the context of African local governments for a number of years. Lucinda has lead the adaption front for ICLEI Africa since late 2008. Lucinda drives the climate and disaster preparedness processes at the local government level through trying to ensure that all key stakeholders, particularly the urban poor (whom she considers most vulnerable and at risk) and local academic researchers and the private sector work together in a transparent process.

**Priscilla Rowswell:**

Priscilla Rowswell currently holds the position of Professional Officer within the Adaptation workstream, Energy and Climate Change at ICLEI Africa. She began her career with ICLEI Africa in February 2010 after graduating from the University of Cape Town with BSc Honours in Atmospheric Science at the end of 2009. Her thesis research was analyzing and calculating South African seasonal forecast skill and comparing it to the respective observed seasonal rainfall for South Africa.

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Holds the position of Junior Professional Officer: Disaster Risk Reduction at ICLEI Africa. She is studying towards a Masters in Technology in Environmental Management: evaluating a project on green business initiatives. She holds a BSc (Hons) in Forest Resources and Wildlife Management from National Unbiversity of Science and Technology (Zimbabwe).

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