eThekwnini Municipality

Climate Change

Why are we here?

Mr. Geoff Tooley
Catchment Management
eThekwnini Municipality
Durban, South Africa.

Dr. Sean O’Donoghue
Environmental Planning & Climate Protection
eThekwnini Municipality
Durban, South Africa.
eThekwini Municipality: efforts to tackle climate change thus far -
## Municipal Climate Protection Programme (MCPP)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Activities</th>
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</thead>
</table>
| Impact Assessment (2004-2006) | • Assessing local impacts of climate change  
• Carbon storage and sequestration analysis |
| Adaptation (2005-)            | • IDP  
• Headline Adaptation Strategy  
• Municipal Adaptation Plans  
• Community Adaptation Plans |
| Developing the toolkit (2007-) | • Integrated Assessment Tool  
• Sea level rise tool |
| Mainstreaming climate protection (2007-) | • Pilot projects  
• Institutional change  
• DCCP  
• Mega projects |

Information sharing and Blue Sky Research

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CLIMATE PROTECTION BRANCH
Some of Durban’s Climate Projects

• Municipal Adaptation Plans
  ✓ Health
  ✓ Water
  ✓ Disaster Management

• Community-Based Adaptation
  ✓ Water supply
  ✓ Food security

• Ecosystem-Based Adaptation
  ✓ Ecosystem services

• Green Roof Pilot Project
• Sea level rise modeling
• Renewable Energy and energy efficiency
• Buffelsdraai Reforestation Project
Reforestation & Ecosystem Restoration Projects:
- Buffelsdraai, Inanda, Paradise Valley
- Opportunistic, associated with hosting mega events
- Carbon offset, alien removal, ecosystem restoration - services
- Treepreneur model - social benefits where most needed
- Mitigation, adaptation, PPP, replicate, upscale, PPP
- UNFCCC - Momentum for Change Programme
Municipal Climate Protection Programme (MCPP)

- Project-based approach
    - Assessing local impacts of climate change
    - Carbon storage and sequestration analysis
- Project implementation preceded policy
  - Adaptation (2005-2006)
    - IDP
    - Municipal Adaptation Plans
    - Community Adaptation Plans
- Trying by doing approach
  - Developing the toolkit (2007-
    - Integrated Assessment Tool
    - Sea level rise tool
- Successes and failures
  - Mainstreaming climate protection (2007-
    - Pilot projects
    - Institutional change
    - DCCP
    - Mega projects

Information sharing and Blue Sky Research
- Project-based approach
- Project implementation preceded policy
- Trying by doing approach
- Successes and failures
November 2011: where to from here?

CLIMATE PROTECTION BRANCH

- Climate change adaptation
  - Municipal Adaptation Planning
    - Health
    - Water
    - Disaster Management
  - Ecosystem-based Adaptation
  - Community Adaptation Planning

COP 17

?
COP17/CMP7 as a radical burst of change in development of MCPP

Stasis:
- Limited staff (2)
- Treading water with large workloads
- Limited political support
- Support within line functions patchy
- Facing political and administration changes: so vulnerable
- Little public awareness
- Adaptation poorly understood and supported locally, nationally and internationally

Opportunity for evolution revealed on 15/2/2010:
- To lead South African climate change response
- Large scale local mobilization and communication
- To create strong champions
- Lobby for more resources
- To profile work to large audiences (locally and internationally)
- Africanize the debate – and to link Durban to this.
- The big win: irreversibly embed adaptation locally, nationally, internationally
Durban Adaptation Charter

- Signed by 106 mayors from 27 countries representing > 950 local governments
- Critical platform for Durban to advance adaptation agenda
Durban Adaptation Charter for Local Governments
as adopted on the 4th December 2011 of the occasion of the
“Durban Local Convention: adapting to a changing climate”
- towards COP17/CMP7 and beyond -

1. Mainstreaming adaptation as a key informant of all local government development planning

2. Understand climate risks through conducting impact and vulnerability assessments

3. Prepare and implement integrated, inclusive and long-term local adaptation strategies designed to reduce vulnerability

4. Ensure that adaptation strategies are aligned with mitigation strategies

5. Promote the use of adaptation that recognises the needs of vulnerable communities and ensures sustainable local economic development

6. Prioritise the role of functioning ecosystems as core municipal green infrastructure

7. Seek the creation of direct access to funding opportunities

8. To develop an acceptable, robust, transparent, measureable, reportable and verifiable (MRV) register

9. Promote multi-level and integrated governance and advocate for partnerships with sub-national and national governments on local climate action

10. Promote partnerships at all levels and city-to-city cooperation and knowledge exchange
Progress Since Signing:

- Alignment with Mexico City Pact, WMCCC, UCLG
- Local political support – Mayor James Nxumalo & CM Sibusiso Sithole
- DAC presented at various international and local meetings

DAC implementation early 2013:

- Implementation Guidance Workshop (USAID funded)
- Urban snapshots survey; workshops, web-based tracking
- ICLEI commitment to DAC - long term home within ICLEI Africa

**Climate Change Adaptation**
Improved resilience of communities and ecosystems to climate change (e.g. water supply)

**Ecosystem restoration**
e.g. wetland rehabilitation; Invasive Alien Species removal from catchment; reforestation

**Climate Change Mitigation**
e.g. reforestation, renewable energy projects

**Social upliftment**
Project contributes towards improved livelihoods for those involved in work

**Green Economy**
Growth of the Green Economy

Co-benefits, PPP, upscale, replicate...
<table>
<thead>
<tr>
<th>Created:</th>
<th>Buffelsdraai</th>
<th>Inanda</th>
<th>CEBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent jobs</td>
<td>24</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>Part-time jobs</td>
<td>7</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>Temporary jobs</td>
<td>220</td>
<td>38</td>
<td>0</td>
</tr>
<tr>
<td>Treepreneurs</td>
<td>685</td>
<td>138</td>
<td>160</td>
</tr>
<tr>
<td>Trees collected</td>
<td>406,676</td>
<td>22,491</td>
<td>650</td>
</tr>
<tr>
<td>Value traded ($)</td>
<td>216,000</td>
<td>14,586</td>
<td>660</td>
</tr>
<tr>
<td>Trees planted</td>
<td>333,023</td>
<td>11,153</td>
<td>36,130</td>
</tr>
<tr>
<td>Ha planted</td>
<td>284</td>
<td>21</td>
<td>25</td>
</tr>
</tbody>
</table>
Key lessons being learnt:

- Cannot separate community from ecosystem-based adaptation
- Example of the green economy in action
- Strength of partnerships (PPP), but complex processes & supporting framework
- New ways of growing economics & managing resources
Reforestation Projects Beneficiation:

Other learning outcomes:

- Sustainability of CEBA? Uptake was too good, difficulty of coping with numbers - possible political and social impacts
- Limitations: resource constraints and oversupply of treepreneurs
- A highly nuanced tale of complexity
- Political support driving policy and strategy development
- Integration across sectors from sectoral MAPs to uMhlangane Catchment management
Integration in 2102: eThekwini Municipality

Climate change adaptation

Municipal Adaptation Planning

Ecosystem-based Adaptation

Community Adaptation Planning

Health

Water

Disaster Management

CEBA

COP 17

CLIMATE PROTECTION BRANCH
The Municipal Adaptation Plans which were approved by the eThekwini Municipal Council in November 2009.

The document is called, “Climate Change - Municipal Adaptation Plan Health and Water” for eThekwini Municipality, and is available on the website www.durban.gov.za
### W1-Detailed analysis of latest rainfall/run-off projections and modeling of systems to be finalized.

<table>
<thead>
<tr>
<th>Implementation plan (including policy framework for addressing issue)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of KwaZulu Natal to finalise detailed analysis of quinery level projections. Water sector officials to work with researchers to understand the nature of and how to interpret results Expand municipality's rain gauge network by 30 gauges.</td>
<td>Improved understanding of the impact of climate change on rainfall and run off and identification of particularly vulnerable areas.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responsible Parties</th>
<th>Resource Availability</th>
<th>Funding Source</th>
<th>National and Provicial Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of KwaZulu Natal, Environmental Management Department; Coastal and Stormwater Catchment Management</td>
<td>Available as work in progress</td>
<td>The University’s work is funded by the Water Research commission – Nationally Funded. The rain gauge network is funded by the eThekwini Municipality</td>
<td>The University’s work is funded by the Water Research commission – Nationally Funded.</td>
</tr>
</tbody>
</table>
• General Circulation Models (GCMs) are coarse and have difficulties in simulating individual convective rainfall events.
• Output from multiple GCMs is used in order to obtain a more representative perspective from that of any one single climate model.
• The GCMs were downscaled to a regional model by the Climate Systems Analysis Group (CSAG) at the University of Cape Town.
• The regional model was then used to produce climatic and hydrological output for each of the 5,838 hydrologically interlinked Quinary Catchments that make up South Africa.
Climate Change Predictions

- 2 - 4 Degree Celsius increase in temp
- 15% increase in intensity of rainfall
- 15% increase in annual rainfall
- Longer dry periods between rain events
Stromwater runoff hydrograph

- Design flow
- Time of Concentration: $T_c$
- Flowrates

\[ Q \]

\[ 0 \]

Time of Concentration

Time
Increasing development
Climate change

flowrates

Time

0

T_c
• W2 - Revise rainfall data in line with latest projections (as of 30 September 2009) and review every 5 years.
• W3 - Elevate Flood Annexure to Council Policy. The flood annexure requires development to determine the 1 in 50 year floodline and to develop outside of this floodline.
W4 - Reduce risk to developments in flood plains through amendment of Bylaw 5.2 (2) (iii) to require developments within the 1:100 yr floodline within eThekwini boundaries to comply with the Flood Annexure.
• W5 - Develop Master Drainage Plans for all river catchments within eThekwini municipal boundaries.
• W9 - Protect and restore riparian vegetation so as to protect integrity of river banks and retain biological buffers against flooding.
• W10 - Ensure that Asset Management Plans consider revised rainfall/runoff data in assessment of the condition of stormwater and catchment management assets.
• W12 - Amend Town Planning 'Scheme Controls' to incorporate fixed parameters for run-off in order to reduce storm water run-off from new developments.
• W13 - Public awareness campaign to raise awareness of the benefits of retrofitting storm water run-off reduction techniques e.g. green roofs, retention/wet basin, detention/dry basin, infiltration basins, rain water harvesters etc to reduce runoff from existing developments.
• W14 - Relocate informal settlements which are highly vulnerable to flooding and sea level rise.
• W15 - Protection of municipal infrastructure (e.g. transport, storm water, sewerage, electric etc).
Municipal adaptation plans for the coastal sector (high priority)

- W6 - Revise coastal set back lines
- W8 - Prepare Coastal Management Plans for entire Durban coastline
- W14 - Relocate informal settlements which are vulnerable to flooding and sea level rise
- W15 - Protection of municipal infrastructure
- O2 - Raise public awareness of issues related to climate change
Challenges

• “Bringing climate change into today’s actions of the City”

• “Including climate change factors into existing requirements on developers”

• “Justifying costs for climate change in the future when needs of the present are so great”

• Finding funding sources to fund the necessary studies on climate change
• “What is the expected change?”
• Shortage of technical staff with capacity to implement climate change work
• Present politics and hard decisions on adaptation
• Senior Political and Technical Leadership is supportive

• Technical staff have found ways to include climate change into existing development requirements without having to call it climate change – less resistance

• Cross sector dialogue is occurring to ensure mitigation in one sector doesn’t have a negative effect on another sector.
Implementation and Maintenance of the Water Reconciliation Strategy for the KwaZulu-Natal Coastal Metropolitan Areas

Revised Water Balance and Reconciliation Scenarios

27 September 2011
Water Balance – Mgeni System

Water reconciliation situation in the Mgeni River System (Sept 2011)
uMhlangane River Catchment – Planning Context

- History of segregated planning has resulted in a city that is sprawled, inefficient and unsustainable
- eThekwini (although 2nd densest in SA) is currently one of the least dense Metropolitan municipalities worldwide, ranked 55th in terms of urban density
- Average existing density across the entire municipality = 3.9 du/ha
- Highest densities occur far away from economic opportunities, social facilities and efficient transportation systems, predominantly in the former townships of INK and Umlazi
- Centrally located historically white suburbs, close to economic activities and social facilities and with surplus infrastructure, have comparatively low densities
- Sprawled development patterns have developed over the last 20 years (Hillcrest, Umhlanga)
- Environmental impact and carbon footprint of Sprawl and ‘Dormitory Townships’ is extensive
EXISTING SPATIAL LOCATION OF DENSITIES
Supporting Studies & Plans

• **Broad level**: Spatial Development Framework (entire city); Integrated Rapid Public Transport Network (IRPTN)

• **Regional level**: Northern Spatial Development Plan (NSDP)

• **Mid level**: Phoenix INK Local Area Plan (component of NUDC)

• **Detailed Level**: Northern Public Transport and Integrated Land Use Corridor (NPTC)
uMHLangane River Catchment – Planning Context

Supporting Studies & Plans - Spatial Development Framework (SDF)
Supporting Studies & Plans – Northern Spatial Development Plan
Supporting Studies & Plans –
Phoenix INK Local Area Plan (Northern Urban Development Corridor)
Supporting Studies & Plans within catchment Northern Public Transport and Integrated Land Use Corridor (NPTC)

Study undertaken in 2008/9 to provide a densification and land use framework for a section of the public transport network.

Phase 2 currently underway – Aim to undertake a Land Use Scheme and Housing model Review to unlock strategic densification.
uMHLangane River Catchment – Problems faced
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All are affected by a poor river system

- Roads
- Electricity
- Sewer
- Water
- Stormwater
- Housing
- Health

- Economic Dev
- Parks
- Politicians
- Insurance industry
- Banks
- Town Planning
- Environment
- Treasury
Two Main Issues facing all levels of Government

- Provide Services – needs funding
- Create Jobs – needs funding

Damage Repair and protection measures are some of the largest costs facing local government which don’t add to the services of the city.
An Integrated Plan to better manage the Umhlangane Catchment would mean...

• Less damage
• Less wasted expenditure
• Less Insurance claims
• More money for services
• New Funding sources
• New Jobs
• And more ........
A Lighthouse Project which will show that a new way of doing things can cost less, create jobs, increase property values, stimulate the economy and help the City adapt for Climate Change.
Sihlanzimvelo
  • Cross Sector Integration
  • Clean litter
  • Restore Riparian Indigenous vegetation
  • Vector Control
  • Standing Water Control
  • Daily Water Quality Monitoring

BORDA DEWATS project site
Cornubia – housing – new way of doing things
Green Rivers Project
Food Gardening Projects – food security issues
Riverhorse Estate – Wetland Rehabilitation
River Rangers – Lower Umhlangane
Bridge City Wetland Rehab – Sports Club?
Development Controls – Attenuation
Densification plans
Biophysical Catchment Assessment
  • Value of ecosystem services
  • Baseline and Scenarios
Thank You

Contact details:

Mr. Geoff Tooley  
e-mail: Geoff.Tooley@durban.gov.za  
Tel: +27-31-311 7271  
Fax: +27-31-311 7490  
www.durban.gov.za

Mr. Derek Morgan  
e-mail: Derek.Morgan@durban.gov.za  
Tel: +27-31-311 1139

Dr. Sean O’Donoghue  
e-mail: Sean.O’Donoghue@durban.gov.za  
Tel: +27-31-322 4304

Dr. AJ Smit  
e-mail: Albertus.Smit@durban.gov.za  
Tel: +27-31-311 7920