East Africa Scenario development

Sylvia Tramberend

Towards Innovative Solutions through Integrative Water Futures Analysis

WFaS Workshop, Entebbe, 4-6 Dec 2018
Overview

- What are scenarios?
  - Global scenarios
  - Scenarios for East Africa
  - Quantification of scenario drivers
Why future scenarios?

- Future is uncertain
- Decisions today determine our tomorrow
What are scenarios?

- Scenarios describe storylines of plausible development pathways into the future.

- Individual scenario features (variables) are interconnected.
Elements of WATER scenarios

- Climate
- Population
- Technology
- Energy
- Values
- Economy
- Terrain
- Land cover/use
- Agriculture
Scenarios

Scenarios describe narratives of plausible future pathways including interconnected variables as they develop over time.
Scenarios for East Africa

• East Africa Regional Vision Scenario (EA-RVS)
  Developed from regional vision documents and the Stakeholder Workshop in Dec. 2017

• Reference Scenario (REF)
  Based on the ‘Middle of the Road’ Scenario developed by the global community in the context of the IPCC
GLOBAL SCENARIOS
The Shared Socio-Economic Pathways SSPs

Source: O’Neill et al., 2015
2. Climate change scenarios

Representative Concentration Pathways (RPCs) describe the climate system and feed into Global Circulation Models (GCMs)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Mean change by 2081-2100</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP 2.6</td>
<td>Can achieve Paris agreement</td>
<td>+ 1.5 °C</td>
</tr>
<tr>
<td>RCP 4.5</td>
<td>Low climate change</td>
<td>+ 1.8 °C</td>
</tr>
<tr>
<td>RCP 6.0</td>
<td>Medium climate change</td>
<td>+ 2.2 °C</td>
</tr>
<tr>
<td>RCP 8.5</td>
<td>Strong climate change</td>
<td>+ 3.7 °C</td>
</tr>
</tbody>
</table>

Source: Stocker, 2014
East Africa
Regional Vision Scenario
(EA-RVS)
EA-RVS storyline
# EAC Vision 2050

<table>
<thead>
<tr>
<th>Goals</th>
<th>Aspirations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to affordable and efficient transport, energy, and communication for increased regional competitiveness</td>
<td>Enhanced agricultural productivity for food security and a transformed rural economy</td>
</tr>
<tr>
<td>Structural transformation of the industrial and manufacturing sector through value addition and product diversification based on comparative advantage for regional competitive advantage</td>
<td>Effective and sustainable use of natural resources with enhanced value addition and management</td>
</tr>
<tr>
<td>Leverage on the tourism and services value chain and building on the homogeneity of regional cultures and linkages</td>
<td>Well-educated and healthy human resources</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pillars</th>
<th>Infrastructure Development</th>
<th>Agriculture, Food Security and Rural Development</th>
<th>Industrialization</th>
<th>Natural Resources and Environment Management</th>
<th>Tourism, Trade and Services Development</th>
<th>Human Capital Development</th>
</tr>
</thead>
</table>

*Source: EAC, 2016. East African Community Vision 2050. Arusha, Tanzania*
EA-RVS storyline

- EAC political & economic integration
- Low population growth, high urbanization
- High educational attainment
- High economic growth
- Fast technological development
- Sustainability principles across domains
- Integrated land use planning
- Agricultural develop. & Industrialization
Quantification of scenario drivers
EA-RVS has less people but a higher urbanization rate compared to REF.

<table>
<thead>
<tr>
<th>POP</th>
<th>2010</th>
<th>2050</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EA-RVS</td>
<td>132 mio</td>
<td>278 mio</td>
<td>approx. double</td>
</tr>
<tr>
<td>REF</td>
<td>138 mio</td>
<td>313 mio</td>
<td>more than double</td>
</tr>
</tbody>
</table>

UN projections are larger, 350 mio for low variant
ECONOMIC GROWTH

EA-RVS shows higher economic growth than REF. For EA-RVS, per capita GDP in the aggregate EAC increases approximately 10-fold between 2010 and 2050.
IRRIGATION

Irrigated area more than triples in REF and increases by a factor of 8 in EA-RVS.
Other data needs for period until 2050s

- Climate change
- Energy sector development
- Land use, especially forest and built-up land development
- Protected areas
- Technology assumptions, e.g. water efficiency improvements
- Cost assumptions
### Scenarios for East Africa

<table>
<thead>
<tr>
<th></th>
<th>EA-RVS</th>
<th>REF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scenario name</strong></td>
<td>East Africa Regional Vision Scenario</td>
<td>Reference Scenario</td>
</tr>
<tr>
<td><strong>Socio-economic development</strong></td>
<td>EA-RVS narrative, many aspects similar to a ‘Sustainability’ SSP1 scenario</td>
<td>The ‘Middle of the Road’ (SSP2) scenario of the Shared Socio-economic Pathways</td>
</tr>
<tr>
<td><strong>Climate change</strong></td>
<td>Ensemble of two Global Circulation Models (MIROC5, HadGEM2-ES) calculated for the emission pathways of RCP 6.0 (i.e. medium climate change)</td>
<td></td>
</tr>
</tbody>
</table>
Thank you for your attention!