WIBIS

Introduction
- Who are involved?
- Challenges

The WIBIS project
- Objectives
- Managing water by managing land

Results
- Tool concept and application
- Indicators
- Analyze current situation
- Identify and discuss future scenarios

Gains
Who are we involved?

Developers:
- LEI (WUR) : Agricultural Economics Research Institute
- Alterra (WUR): Research Institute for the Green Environment
- WaterWatch: Scientific Advisory firm specialised in water management using satellite data
- WE consult: Advisory firm on Water Resources and Environment (Mozambique)

Main stakeholders
- DNA, DWAF-SA, DWA, Ministries of Agriculture
- PRIMA initiative
- ICMA, ARA-SUL
Challenges

The Inkomati basin experiences:
- Competing claims on Land & Water Resources (between sectors and areas/countries)
- Water variability & scarcity / over-allocation / global climate change / land development and reforms
Objective

Development of a Discussion Support Tool that provides transparent, impartial and verifiable information regarding the impact of land-use changes on water consumption and productivity.

Support the process of the implementation of the transboundary Tripartite Interim Agreement
Managing water by managing land

Emphasis on land management & spatial planning

- The availability of surface water resources (and groundwater resources) is primarily determined by land use and management
- Water planning and management is the secondary determining factor
Managing water by managing land

Rainfall
≈ 5 billion m³/year

In the Inkomati basin agriculture and forestry receive more than 5 times more water as rainfall than the amount of freshwater withdrawn for irrigation

Agriculture (incl. forestry)

Irrigation
< 1 billion m³/year

Runoff
Tool application

- Analyze (current) situation
- Interactively identify (spatial distributed) land use scenarios
- Rapid assessment on various indicators (various policy priorities)
- Discuss outcomes

Detailed assessment of scenarios
Indicators for policy priorities

- **Crop water productivity** CWP (kg/m$^3$)
  yield per unit of water consumed
- **Economic water productivity** EWP (€, $, R/m$^3$)
  net private benefits per unit of water consumed
- **Socio-economic water productivity** SWP (jobs/m$^3$)
  net social benefits per unit of water consumed
- **Water equity** (m$^3$)
  Water available to downstream uses

Food security

Income

Social security

Equity
Analyze current situation and evaluate alternatives

by visualizing geographical, temporal and sectoral distribution of the indicators as well as thematic information (land use, rainfall, evapotranspiration, biomass production)

- Geographical: 24 land management areas
- Temporal: 3 years: dry, average, wet
- Sectoral: 15 land uses
Analyze present situation. Example: Rainfall surplus
## Analyze present situation

### Example

<table>
<thead>
<tr>
<th>Average year</th>
<th>Evapotranspiration (mm/year)</th>
<th>Forestry</th>
<th>Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mozambique</td>
<td></td>
<td>777</td>
<td>1001</td>
</tr>
<tr>
<td>Swaziland</td>
<td></td>
<td>939</td>
<td>808</td>
</tr>
<tr>
<td>South-Africa</td>
<td></td>
<td>802</td>
<td>765</td>
</tr>
</tbody>
</table>
Example: Economic water productivity sugar
### Example: 25,000 ha sugarcane in Mozambique

<table>
<thead>
<tr>
<th>Area 5</th>
<th>Average year</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWP (kg/m³)</td>
<td>0.023</td>
<td>0.164</td>
<td></td>
</tr>
<tr>
<td>EWP (ZAR/m³)</td>
<td>0.003</td>
<td>0.116</td>
<td></td>
</tr>
<tr>
<td>Production value (million ZAR)</td>
<td>8</td>
<td>321</td>
<td></td>
</tr>
<tr>
<td>Water use related jobs</td>
<td>1086</td>
<td>18028</td>
<td></td>
</tr>
<tr>
<td>ET&lt;sub&gt;act&lt;/sub&gt; (mm)</td>
<td>672</td>
<td>691</td>
<td></td>
</tr>
<tr>
<td>Commercial area (ha)</td>
<td>2450</td>
<td>27401</td>
<td></td>
</tr>
<tr>
<td>Rainfall surplus (million m³)</td>
<td>62</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Water availability to downstream areas (million m³)</td>
<td>1727</td>
<td>1675</td>
<td></td>
</tr>
</tbody>
</table>
Gains

Stakeholders discussions are now based on impartial and verifiable information

Tangible indicators for policy development

Support to discussions during the following meetings:
- Task Team of the TPTC meeting May 2008 Swaziland
- LOGO-South twinning April 2009 Mozambique
- PRIMA water allocation workshop Nov 2009 Swaziland
- African Water Week Nov 2009 South-Africa
- REMCO Conference October 2010 Swaziland