K&C Science Team Phase 1: Project Report

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Background: Wetlands and Agriculture

- Increasing demand for water
- For sustainable use, development activities need to integrate biodiversity considerations
  - Livelihoods may be damaged
  - Freshwater biodiversity, ecosystem services lost
- 50% loss in wetland habitats globally (mainly caused by agriculture)
- Information on wetland ecosystems in Africa is widely dispersed, disorganised and largely inaccessible to decision makers

Provision of water for irrigation/HEP/drinking may impact upon integrity of wetland ecosystems and associated biodiversity. Planning to minimise potential impacts requires integration of information on distribution, ecology.
K&C Science Team: Phase 1

- Collaboration between IWMI, Ramsar and WI
- Mapping of globally significant wetlands to improve nature conservation, environmental protection, sustainable development
- Support the information needs posed by the Ramsar Convention on wetlands
- Focus on “prototype areas” - Africa

A non-profit scientific research organization focusing on the sustainable use of water and land resources in agriculture and on the water needs of developing countries.

IWMI works with partners in the South to develop tools and methods to help these countries eradicate poverty through more effective management of their water and land resources.
Characterisation of the Lake Chilwa wetland, Malawi

- Generate knowledge to assist in the sustainable management of wetlands
- Assist countries to put in place mechanisms that minimize degradation
- Provide baseline wetland information from remote sensing data
- Generate generic guidelines, tools and methodologies
Characterisation of the Lake Chilwa wetland, Malawi

Broad wetland classes derived from annual flood dynamics

Distribution of wetland vegetation
Characterisation of the Lake Urema wetland, Mozambique

September 2007
Characterisation of the Lake Urema wetland, Mozambique

PALSAR Multi-temporal dataset: Principal Components Analysis highlights flood patterns

Identification of wetland classes based on flooding regime
Mapping seasonal patterns of inundation:

Global Lakes and Wetlands Database (Lehner and Doll 2004)

- Lake
- Reservoir
- River
- Freshwater Marsh/Floodplain
- Coastal Wetland
- Freshwater/Brackish/Saline Wetland
- Intermittent Wetland/Lake
- Nile Basin
- Ramsar Sites

ALOS PALSAR (ScanSAR, RSP 250) data (07/07, 01/08, 06/08), The Sudd Wetland

ALOS PALSAR (FBD, HH, HV, HH/HV, 07/08), The Sudd Wetland
Mapping seasonal patterns of inundation:

ALOS PALSAR (ScanSAR, RSP 250) data (07/07, 01/08, 06/08), The Sudd Wetland
Mapping spatial patterns of inundation:

Inland fisheries in Africa:
- Food security, income, employment
- Lack of information hinders management
- Threatened by degradation of environment, loss of habitat, overexploitation

First step: to inventory and characterise the waterbodies which support fisheries
**RS and fisheries habitats:**

**Broad inventory of inland fisheries habitats (kind, quantity, area)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Fisheries habitat (mha)</th>
<th>Production (Tonnes, 2006)</th>
<th>Productivity (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>2.9 (2.1)</td>
<td>851,318</td>
<td>288.32</td>
</tr>
<tr>
<td>Sudan</td>
<td>16.6 (7.1)</td>
<td>58,900</td>
<td>3.56</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2.9 (2.2)</td>
<td>9,890</td>
<td>3.43</td>
</tr>
<tr>
<td>Uganda</td>
<td>5.7 (5.0)</td>
<td>399,491</td>
<td>70.44</td>
</tr>
</tbody>
</table>

**Predicting potential fish yields:**
- Few/no estimates of annual catch available for individual waterbodies

**Potential predictor variables (Halls 1999):**
- Surface area of the waterbody and catchment mean annual air temp
RS and fisheries productivity: predicting potential yield

- Sets rate of biological production
- Determines fish habitat availability
### RS and fisheries productivity: predicting potential yield

<table>
<thead>
<tr>
<th>Country</th>
<th>Fisheries habitat (ha)</th>
<th>Actual Productivity (kg/ha)</th>
<th>Potential productivity (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>2,952,640</td>
<td>288.32</td>
<td>99.4</td>
</tr>
<tr>
<td>Sudan</td>
<td>16,556,700</td>
<td>3.56</td>
<td>94.9</td>
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<tr>
<td>Ethiopia</td>
<td>2,885,080</td>
<td>3.43</td>
<td>86.2</td>
</tr>
<tr>
<td>Uganda</td>
<td>5,671,170</td>
<td>70.44</td>
<td>97.8</td>
</tr>
</tbody>
</table>

Across broad areas or where better data are not available simple models based on environmental variables can provide insight.
Thank you!