Management of wetlands for improved food security

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Aspects of food security considered

Food Availability – Modified Wetlands for Crop production
Food availability — Fish from unmodified Wetlands
Food Accessibility: Income from wetland products
Challenges of resource use:

No guidelines on scale of use & appropriate technologies to sustain wetland services
Availability & Accessibility – Livestock grazing and watering
The Problem:

- **The appropriate management of wetlands for food security lacks:**
  - Data on impact of food security related activities;
  - Tested technologies for most activities;
  - Evidence based data to back formulation of guidelines;
  - Evidence to base on development of policies;
  - Appropriate measures to operationalise the guidelines and policies.
The Project:
Managing Wetlands Resources for Improved Food Security (MWRIFS) in Uganda

How is MWRIFS filling the gaps?

- Consortium with expertise and experiences from relevant Partners to provide information and Knowledge on use of wetlands for improved security, with safeguards of wetland integrity;
- Testing appropriate resource use practices that cater for food security, while safeguarding wetland services and integrity;
- To develop guidelines to resource users;
- To facilitate policy dialogues.
Overall objective

To find out potential feasible and implementable practices and tradeoffs to improve food security and wetlands ecosystem health and sustainability in Uganda

Specific objectives

1. Determine the extent to which ownership, access to and use of wetland resources contribute to household food security in selected areas of Uganda

2. Assess trade-offs in wise use of wetlands for food security and ecological functions

3. Test, adapt and promote gender balanced innovations for enhancing wetland conservation for food security

4. Inform and guide the wetland policy implementation process on the wise use of wetlands for food security and conservation
Preliminary Results

$$a \pm \sum (a + b) \sqrt{(c - d) \left( \frac{a}{b} \right)}$$
Preliminary Results – Contribution of wetlands to FS:

To what extent do wetlands contribute to FS?

- Over 83% of the households experienced food insecurity mainly indicated by low harvest and when people buy locally grown food items.
- Prevalence of FS significantly higher among households that are female headed, larger and participate in collection of wetland resources.
- Households with older heads are likely to have a higher dependence on wetlands for food security.
- Over 80% of the respondents reported that wetland resources provide products and services that contribute enormously to their household food security.
- Wetlands indirectly contribute to FS by providing services that increase food production e.g. weather modification and nutrient retention.
- About 70% of households using wetlands for crop production.
- Local farmers vulnerable to starvation in times of environmental stress (droughts and floods) because of dependence on rain fed agriculture.
Results – Knowledge, Attitudes and Practices (KAP)

Is contribution of wetlands to FS appreciated and what messages are needed?

- There are significant gender dimensions over ownership, access, control and use of wetland resources for improved FS:
  - Men assume ownership for wetlands adjacent to their land and control access.
  - Women and children use most of the open access wetlands freely, but seek permission from men for wetlands with assumed ownership.

- There is limited knowledge and level of appreciation of the interrelationships between wetlands ecosystems and food security issues among the gender groups.

- Men focus more on wetland resources for generating direct cash such as fish, clay and sand; while women and children focus on subsistence resources such as firewood, water for domestic use and craft raw materials.

- The implication of harvesting resources for direct income by men lead to more wetland degradation compared to subsistence harvest by women and children.
Knowledge of wetland ecosystem services by gender

- None
- Home of wild animals
- Transport
- Weather modification
- Cleaning the water before use
- Breeding ground for fish
- Tourism
- Sand mining
- Crop farming
- Prevent soil erosion
- Act as boundaries
- Control floods
- Firewood
- Swimming

Number of respondents

Men
Women
Children
Findings

- Attitudes about wetland and conservation

The conservation methods still unmatched with the attitudes????????
Preliminary Results – Spatial Analysis:

Is the degradation of wetlands in search of food security real and where is it coming from??

• Use of wetlands resources linked to wetland coverage
• Over 60% of the local people perceived wetlands in their proximity to have undergone degradation within the last 10 years
• Other significant changes of concern include decline in quantity and quality of vegetation and reduced water level as main indicators
• Locally perceived threats to wetlands were mainly from crop growing, collection of wetland resources and floods and droughts.
• Reports from the study indicated that farmers have resorted to use of wetlands for farming due to declined fertility of upland agricultural areas
• Change over a period of 25 years from 1986 to 2011- significant reduction in wetland types, mainly attributed to crop farming
Wetland cover change for years 1986, 2000 and 2011

Legend
- District boundary
- Open Water
- Seasonal Woodland
- Seasonal Bushes and Thickets
- Permanent Grassland
- Seasonal Grassland
- Papyrus
- Permanent Subsistence Farming
- Seasonal Subsistence Farming
TEV and Trade off analysis of wetlands to FS

How much are we loosing or gaining in terms of FS, after all wetlands do not vote

Summary of total econ. contribution of wetlands to FS in Uganda

Dollar values of CBA, Trade off Analysis, Restoration costs?????

<table>
<thead>
<tr>
<th>Resource contribution (US$)</th>
<th>SW Farmlands</th>
<th>L. Vic Crescent</th>
<th>Kyoga Plains</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TEV to food availability</td>
<td>26,928,807</td>
<td>16,355,461</td>
<td>43,350,093</td>
</tr>
<tr>
<td>2. TEV to food accessibility</td>
<td>3,152,824</td>
<td>5,644,272</td>
<td>7,060,900</td>
</tr>
<tr>
<td>3. TEV through services &amp; functions</td>
<td>302,472,977</td>
<td>1,409,106,088</td>
<td>707,623,242</td>
</tr>
<tr>
<td>A. TEV OF WETLANDS TO FS</td>
<td>332,554,608</td>
<td>1,431,105,820</td>
<td>758,034,236</td>
</tr>
<tr>
<td>Costs of management &amp; maintenance of wetlands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Management costs</td>
<td>19,040</td>
<td>14,200</td>
<td>15,428</td>
</tr>
<tr>
<td>6. Opportunity costs</td>
<td>1,404,266</td>
<td>6,614,910</td>
<td>3,325,280</td>
</tr>
<tr>
<td>B. TOTAL ECON. COST TO MAINTAIN THE WETLANDS</td>
<td>1,423,306</td>
<td>6,629,110</td>
<td>3,340,708</td>
</tr>
<tr>
<td>C. NET ECON. VALUE OF WETLANDS FOR FS</td>
<td>331,131,302</td>
<td>1,424,476,710</td>
<td>754,693,528</td>
</tr>
<tr>
<td>D. NET BENEFITS PER HA PER YR (US$)</td>
<td>11,358</td>
<td>10,388</td>
<td>10,948</td>
</tr>
</tbody>
</table>
Results — Farming Technological and social Innovations in response to Wetland Edge Gardening and Rice Growing Guidelines
Results — Farming Innovations:

In response to Wetland Edge Gardening and Rice Growing Guidelines

- **Farmer level innovations on Vegetables and Coco yams**
  - There is low use of soil fertility management innovations leading to low yields;
  - Increased yields by four times through use of integrated soil fertility management innovations; such as inorganic and organic fertilizers is an incentive to farmers,
  - Water use efficiency technologies such as water channels and treadle pumps can increase yield at the wetland edges
  - Cultivation of crops on interiors of wetlands has risks of crop destruction by floods, a common phenomenon with unpredictable weather due to climate change
On-farm experiments on rice

• Improved varieties (K85 and Wita 9) selected by farmers had higher grain yields (twice the yields of local variety Buyu)

• Improved varieties (K85 and Wita 9) had higher grain yields, were resistant to lodging, had short maturity period and were more adapted to the peripheral parts of the wetland

• High producing improved varieties can act as incentives for rice growers to use wetland edges and limit extending to the core of wetlands as prescribed in guidelines

Carrying capacity livestock grazing and watering

Experiments on-going
Variety evaluation fields at the peripheral part of Limoto wetland in Eastern Uganda
Grain yields of the different lowland rice varieties
• Key policies that guide use of wetland resources for improved food security include the wetlands policy of 1995 and the food and nutrition policy of 2005;

• A number of provisions exist in different policies and legislation for other sectors such as agriculture and fisheries;

• There are incidences of conflicting policies or unclear understanding of the law, which lead to disjointed planning;

• For example, implementation of the agricultural policy has limited recognition of the fact that promotion of agriculture should consider wetland ecosystem impacts

• Implementation of the different policies should put in consideration likely impact on other sectors.
Relevance of MWRIFS work to Wise use: Smart Plans

• Increasing productivity from wetlands, with consideration of the wetlands integrity:
  • Providing evidence-based data for management planning such as putting in place measures for zoning wetlands for different uses protecting the core wetlands and management planning
  • Communication with policy makers, implementers, planners in a simpler language that can be understood
  • Development of guidelines for wise use of wetland resources e.g. rice growing; wetland edge gardening; livestock grazing and watering
  • Developing bye laws with considerations of wetland management and food security
  • Influencing policy and investment in conservation
In Conclusion

- With increasing population, coupled with land shortage, reduced productivity and climate change; households with limited options will continue to rely on wetlands for food security;

- With limited knowledge base to employ innovative food production technologies, reduced access to and control of the wetlands resources base;

- With the continuous demand for goods and services, increased rate of wetland degradation, reduced benefits from wetland goods and ecosystem services;

- Better planning regimes are needed to address and balance the increasing needs of wetland dependant communities.
Recommendations

• Economic valuation and trade off analysis tools should be used as justification for continued investments in wetland management

• There is need to design appropriate food production technologies that ensure sustainable use of wetland resources for food security, with safeguard to wetland services

• There is need for more capacity building to guide meeting food security demands with consideration of wetland services through training and awareness to wetland resource users

• Planning for food security and wetland management needs deliberate harmonization efforts of different policies and legislation at all levels
Can make wetlands contribute to food security, while maintaining their integrity???