Food and Agriculture Organization of the United Nations

NARO

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# Expected outcomes of Flexible Water Service approach: Increasing water saving through Flexible Water Service in Uganda

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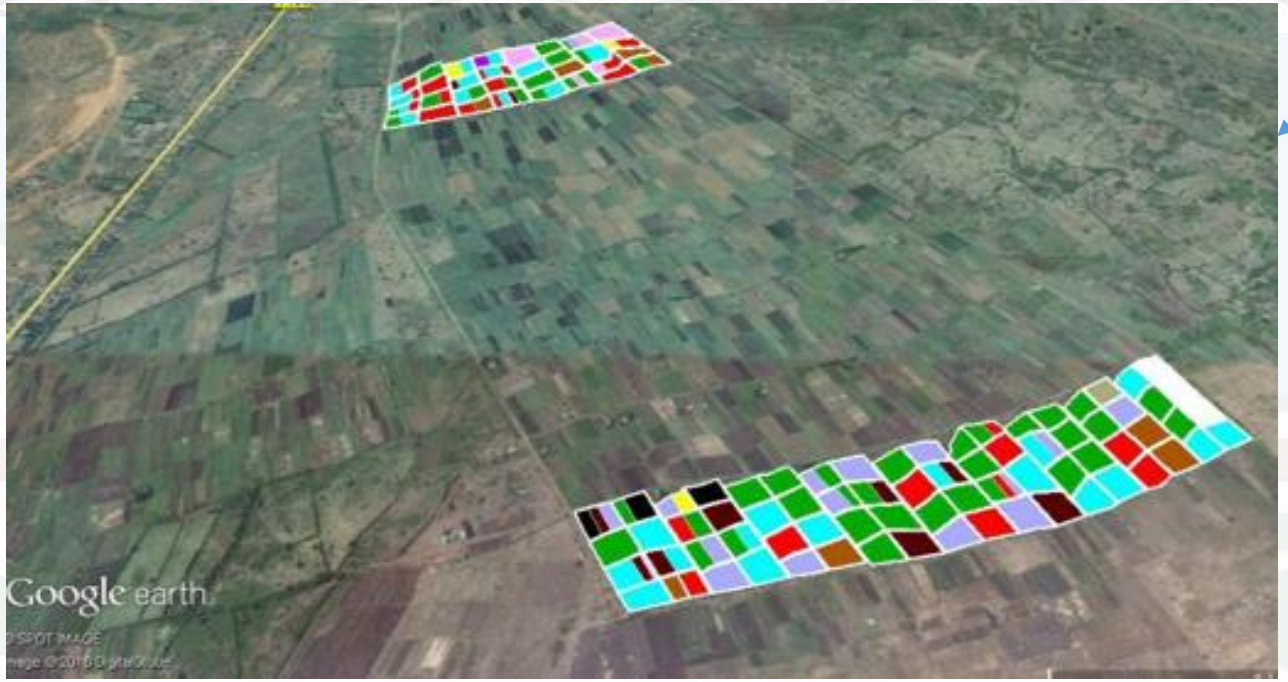
## PRESENTATION OUTLINE:

- Pilot area location;
- Introduction;
- Objectives of the paper;
- Outcomes of Flexible Water Service approach;
- Possibility of scaling-up the results;
- Lessons learnt and recommendations.

# PILOT AREA LOCATION




**Mubuku**


Location in Uganda

Coordinates: 00°15′41″N 30°07′27″E

| | |
|---|---|
| **Country** | Uganda |
| **Region** | Western Uganda |
| **Sub-region** | Rwenzururu sub-region |

# Objectives of the paper

- Share results from flexible water service approach the case of Mubuku irrigation scheme;

- Propose prospects of scaling up the results in Uganda.

# Results / outcomes from flexible water service approach

Water saving:

- Maize demonstration farms on average withdrew 22 l/s field canal irrigation water service and the adjacent control farms were continuously withdrew 55 l/s. The balance of 33 l/s is enough to simultaneously irrigate another maize farm;

- Rice demonstration farms withdrew 18 l/s compared to 41 l/s for the control farms with a 23 l/s saving, enough to irrigate another rice farm ;

- Onion demonstration farms withdrew 15 l/s per application while control farms applied 30 l/s. This is 15l/s more and enough to another onion farm.

# Results / outcomes from flexible water service approach

**Improved equity and conflict resolution:**

- The use rating curves by farmers to verify water allocation, enhanced transparency and conflict resolution, reduced water thefts and improved equity

- Use of Smart phone (iMoMo) data capture method for quick verification

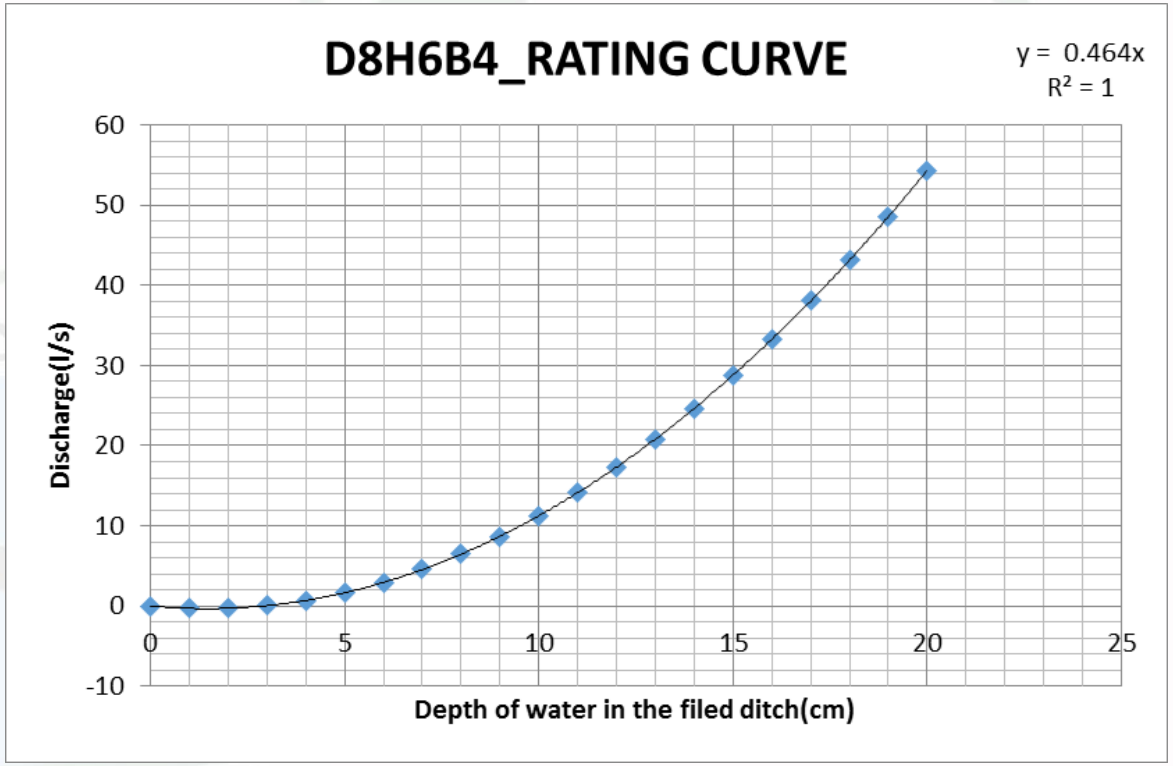
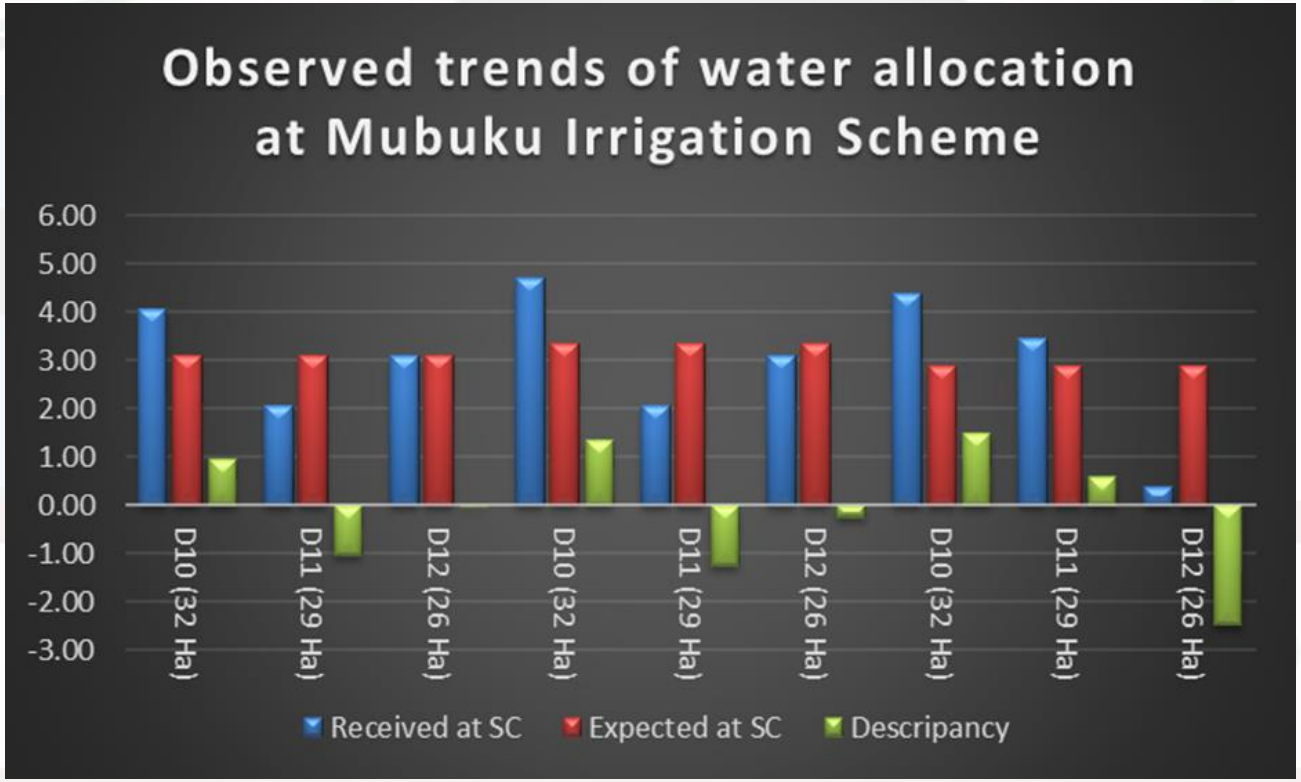



Figure: Rating curve for one of the tertiary canals

# Results / outcomes from flexible water service approach

- The continuous data collection provides evidence on the gaps and loopholes in the scheme's water allocation system;
- Culprits are exposed, abandoning the practice;
- Enhanced farmers' acceptance of the results and confidence in the research findings.

| Duration | Month 1 Average water allocation (l/s/Ha) | | | Month 2 Average water allocation (l/s/Ha) | | | Month 3 Average water allocation (l/s/Ha) | | |
|---|---|---|---|---|---|---|---|---|---|
| Secondary Canal (SC) | D10 | D11 | D12 | D10 | D11 | D12 | D10 | D11 | D12 |
| Received | 4.06 | 2.07 | 3.08 | 4.69 | 2.07 | 3.08 | 4.38 | 3.45 | 0.38 |
| Expected | 3.10 | 3.10 | 3.10 | 3.33 | 3.33 | 3.33 | 2.87 | 2.87 | 2.87 |
| Discrepancy | 0.96 | -1.03 | -0.03 | 1.35 | -1.26 | -0.26 | 1.50 | 0.57 | -2.49 |



# Results / outcomes from flexible water service approach

Improvement in germination:

- Maize demonstration farms on average registered 95% germination at regulated irrigation water supply as opposed to 78% on the adjacent control farms;

- For rice demonstration farms 83% germination was achieved as opposed to 60% in the control farms;

- Onion demonstration farms on average registered 92% seedlings survival at regulated irrigation water supply as opposed to 74% on the adjacent control farms.

# Results / outcomes from flexible water service approach

Yield enhancement:

- At 14% moisture content, maize demonstration farms under flexible water service on average registered 4.1 tons/ha compared to 3.5 tons/ha from on the adjacent control farms;

- For rice demonstration farms 1.2 tons/ha was achieved as opposed to 0.7 tons/ha in the control farms;

- Onion demonstration farms on average registered 2.4 tons/ha as opposed to 1.1 tons/ha on the adjacent control farms.

# Results / outcomes from flexible water service approach

Nutrient saving :

- At maize and rice demonstration farms fertilizers were applied in 3 phases and 6 phases for onions. Each fertilizer application was followed by a regulated water application event for best results.

- On the control farms similar amounts were applied at once followed by water application;

- Tests indicated traces of fertilizers in drain from the control farms as opposed to none in the drain water from demonstration farms;

# Results / outcomes from flexible water service approach

Reclamation of water logged farms:

- About 80 Ha of the scheme land is waterlogged due to seepage water from upstream irrigation activities.

- Up to 7 Ha downstream of the demonstration farms were salvaged as a result of applying reduced water through a flexible water service;

- It is our conviction that if the flexible water service approach is scaled up the entire scheme, more land and probably all waterlogged farms may be salvaged;

# Results / outcomes from flexible water service approach

Reduced furrow maintenance cost:

- Irrigation with high flows often eroded the furrows calling for their cleaning prior to each water application event;
- The cost of irrigation including furrow cleaning is UGX. 300 per furrow as opposed to UGX 200 without furrow cleaning.

# Possibility of scaling-up the results

- Scaling up will require installation of 8 broad crested weirs along secondary canals, 82 flumes in tertiary canals & reconstructing 650 field canals;

- For effective flexible water service will require masonry lining of tertiary canals, reconstruction of field canals and provision of siphons to furrows;

- The existing night storage reservoir evaluated for its potential w.r.t flexible water service and improvements made to connect it to the user farms.

# Possibility of scaling-up the results

- Scaling up may require characterization of164 farms, properly graded and furrows reconstructed to aid the generation of optimal service levels;

- Improving farm management through capacity building of scheme water managers, farmers, strengthening WUA, generation of responsive irrigation schedules, promotion of agricultural management practices guidelines and decision support tools;

- Scaling out flexible water service interventions irrigation schemes countrywide totaling 9130 Ha.

# Challenges encountered during flexible water service approach

- Synchronizing the flexible water demand with the supply service oriented water allocation program;
- Delayed releases/response to water demand affected other field monitoring activities;
- Neighboring farmers that took advantage of the unexpected releases to access more water outside their mandatory allocations;
- Use of specialized flow measuring equipment (in field canals) required skilled personnel;

# Challenges encountered during flexible water service approach

- Interruptions from water theft by neighboring farmers required lockable gates;
- Water saved could not be purposively utilized by the supply oriented system management since it had not been budgeted for;
- The current infrastructural arrangement that lacks provision for temporary storage of saved water;
- Timely response to water demand difficult as it required adequate mobility of the supplier as well as responsive water control structures;

# Conclusions and Recommendations

- The flexible water service approaches tried at Mubuku resulted into water savings of 27%, 40% and 50% the official allocation on maize rice and onion farms respectively;

- Consequently, yields at the demonstration farms were higher than for control farms by 17%, 71% and 118% for maize, rice and onions respectively;

- To maximize benefits of the flexible service system, the interventions piloted at a few farms at Mubuku should be scaled up over the entire scheme and out to other irrigation schemes in the country