



Modernization of Agriculture in Uganda. How much has government done through irrigation?

Uganda's total area is 241,550.7 square kilometers (sq. km), water bodies share 36,527.4 sq.km (15.3% of Uganda's total area). Uganda's population stands at 34.9 million, and the majority (81.6%) live in rural areas. The country's population growth rate is 3.03 % per annum (UBOS, 2015). The agricultural sector is important to the Ugandan economy as it employs approximately 69% of the population and contributed about 26% to the GDP (Uganda Economic Outlook 2016). Despite the critical importance of the sector, it is predominantly subsistence and the average annual growth rate over the last five years was 2.2% (Budget Framework Paper 2017/18). Climate change has majorly affected food and agriculture in the country (FAO, 2010). This is associated with erratic rain patterns, floods and prolonged dry spells. The current adverse variations in climate change have made it difficult to depend on rain-fed agriculture. However, little attention has been accorded to technological and human capacity development in irrigation. This briefing paper explores the irrigation practices in the country and their relationship with agricultural

Modernizing Agriculture

The National Development Plan (NDPII) acknowledges the need to increase agriculture production and productivity as key to sustainable economic development and driving Uganda to middle income status. The government strategic direction is to increase access to water for agricultural production by increasing acreage of land under irrigation for mitigation purposes. Irrigation has been mainly for large-scale schemes for cash crops such as rice, sugar canes and flowers for export. Only 1% of potential irrigable area (15,000ha) out of 3,030,000ha is under formal irrigation in Uganda.

Irrigation is the application of a specific amount of water appropriate to the crop's stage of growth. It can also mean the application of water in amounts necessary to bring soil to the desired moisture level prior to planting.

Key Issues

- *Only 1% of potential irrigable area (15,000ha) out of 3,030,000ha is under formal irrigation in Uganda.*
- *Large irrigation schemes development is affected by land acquisition snags.*
- *Irrigation requires high capital investment which is quite unaffordable for many individuals.*
- *There is limited capacity for planning, designing and construction of irrigation schemes in the country.*
- *The water stressed areas make abstraction and transfer costs for longer distances quite unaffordable for farmers.*



Irrigation Practices in Uganda

These are defined by the size of the irrigated area: large-scale (>500 ha), medium-scale (100–500 ha) or small-scale (<100 ha). Large-scale irrigation currently dominates functional irrigation schemes in Uganda or those under rehabilitation, accounting for 76% of the total area under irrigation (about 8,500 ha of the total 11,200 ha).¹ Most of the large irrigation schemes were constructed by the Central Government under Water for Production. Other smaller systems such as the solar mini irrigation systems are planned and implemented at the three regional levels countrywide. The water is channeled through canals, sprinkler irrigation system, drip irrigation system and spot – on irrigation system to the gardens. In some cases, fertigation² is done to improve production and productivity. The pictures below show some of the irrigation practices.



L-R: Mubuku water storage reservoir; Canals to fields at Mobuku Irrigation Scheme



L-R: Fertigation house at the Presidential Initiative on Banana Industry in Nyaruzinga Ishaka-Bushenyi Municipality; An apple garden under Nyamitanga Archdiocese Mini Irrigation in Mbarara District

¹ Irrigation Development in Uganda, 2017

² Fertigation refers to application of fertilisers in water before it is released for irrigation



Table 1: Big Irrigation Systems provided by Ministry of Water and Environment as at 15th February, 2018

Scheme	District	Hectare (ha)	Estimated Cost (Ug Shs)	Target Commodity	Scale	Status
Doho I	Butaleja	1000	18,818,982,160	Rice	Large scale	Functional
Mubuku I	Kasese	516	19,347,862,600	Horticulture, Rice	Large scale	Functional
Agoro	Kitgum	620	27,602,502,180	Horticulture	Large scale	Functional
Olweny	Lira	600	47,625,111,386	Rice	Large scale	Under rehabilitation
Rwengajju	Kabarole	116	27,301,186,392	Rice, Citrus and Horticulture	Large scale	New
Mubuku II	Kasese	480	33,058,059,037	Horticulture, Rice	Large scale	New
Doho II	Butaleja	1178	26,169,613,210	Rice	Large scale	New
Tochi	Oyam	500	28,283,880,419	Rice and Citrus	Medium-scale	New
Ngenge	Kween	880	39,906,718,088	Rice and Citrus	Medium-scale	New

Source: MWE; Report on Irrigation Development in Uganda 2017

Other existing irrigation schemes include: Kibimba (3,900 ha) in Bugiri, Kakira (1,500 ha) in Jinja, Lugazi (322 ha) in Buikwe, Greenhouse farms in the lake in Wakiso (230 ha), Muhokya in Kasese (50 ha) which are functional. Kiige in Kamuli (369 ha), Odina Soroti (365 ha), Labori Serere (284 ha), Atera (809 ha) in Apac, and Ongom (300 ha) in Alebtong are in a dilapidated state.

A number of technologies for demonstration and up scaling were established to improve land management and resilience to climate change in land degradation hotspot areas. Small scale irrigation is one of the Small Land Management technologies promoted to improve and sustain agricultural production in response to the undesirable effects of climate change, particularly in water stressed areas. These are implemented under the Ministry of Agriculture, Animal Industry and Fisheries in the land degradation hotspots within the nine major agro-ecological zones.

Ownership of Irrigation Schemes

This is mainly public while in a few cases they are privately or communally owned. The day-to-day running of public irrigation schemes is handled by the government or delegated to farmer cooperative societies and water user associations. Beneficiaries pay a management fee for maintenance of the facilities. However, Government is establishing Sustainable Water for Production Management Systems through the private sector arrangement for improved functionality.

Water Supply Systems

In Uganda, surface irrigation (96%) is the most predominant. The most common surface irrigation methods are basin irrigation and furrow irrigation, while the most common pressurized irrigation methods are drip irrigation, overhead sprinkler, or spot on sprinkler irrigation. Run-off-river diversion-based gravity-fed irrigation systems use a weir to divert water into a main canal that flows under gravity to the fields. Reservoir-based gravity-fed irrigation systems use water from an earth dam or reservoir system that is diverted to



the fields by gravity through intake structures and canal systems.

Constraints to Irrigation

- ✚ Irrigation is an expensive venture to carry out at individual level be it designs or actual implementation. The cost of machinery coupled with unreliable market conditions for agricultural commodities, high operational costs, and unstable agricultural prices does not make economic sense to farmers.
- ✚ There is general lack of local expertise in planning, design, and construction of standard irrigation projects and hence, reliance on expatriates rendering the projects very costly to implement.
- ✚ Some areas in the country are water stressed, while in other cases, abstraction and transfer costs for longer distances are unaffordable given the low income levels of some farmers.
- ✚ Land acquisition and compensation is a complex enterprise. The heightened land conflicts in terms of ownership across the country affect establishment of irrigation schemes.

Conclusion

Agricultural commercialization requires a lot of effort geared towards mitigation of climate change adverse effects among others. Irrigation technological adaptation is one of the key ingredients to improved agricultural production and productivity. This requires irrigation skills development, development of cost effective irrigation technologies and setting up a fund for land acquisition for scheme establishment. This will eventually lead to sustainable development.

Recommendations

- ✚ The government through MWE and the Ministry of Finance, Planning and Economic Development should build a long-term

investment infrastructure and where possible take advantage of opportunities like the clean energy support International Solar Alliance (ISA) fund and use it for solar pump irrigation for cost effectiveness.

- ✚ The Water Resource Institute-Entebbe should design tailor made courses in irrigation to provide skills in climate change mitigation.
- ✚ The MWE should spearhead development of cost effective technologies in irrigation at the Appropriate Technology Center and promote uptake of simple irrigation technologies by famers.
- ✚ Government should set up a special fund for land acquisition for infrastructure project development in order to reduce delays from compensation, and eliminate the financial pressure the projects put on the National Budget.

References

1. Food and Agriculture Organization of the United Nations- www.fao.org
2. Irrigation Development in Uganda: Constraints, Lessons Learned, and Future Perspectives: www.mwe.go.ug
3. MAAIF and MWE: National Irrigation Policy November, 2017
4. MFPED, Budget Monitoring Reports FY 2012/13-2017/18.
5. Plan for Modernisation of Agriculture: Eradicating Poverty in Uganda: www.inclusivebusinesshub.org
6. UBOS Statistical Abstract 2016: www.library.health.go.ug
7. MWE: Sector Development Plan 2015/16-2019/20- www.mwe.go.ug

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