



MINISTRY OF WATER AND ENVIRONMENT

IMPROVING LIVELIHOODS THROUGH WATER FOR PRODUCTION



Episode 2,
September 2019

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List of Acronyms

MWE	Ministry of Water and Environment
WFP	Water for Production
SSIS	Small Scale Irrigation Scheme
ISO	Irrigation Scheme Operator
CAO	Chief Administrative Officer
FFS	Farmer Field School
O&M	Operation and Maintenance
CBMS	Community Based Management System
GDP	Gross Domestic Product
Q&A	Question and Answer
PPP	Public Private Partnerships
OPM	Office of the Prime Minister
GoU	Government of Uganda
FY	Financial Year
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
GoU	Government of Uganda
WUC	Water User Committee
FBMQ	Farmer Based Management Organisation

“The role of Water for Production in elevating poverty and improving people’s livelihoods in the Country”

The Ministry of Water and Environment is undertaking several programmes in the development and utilization of water resources for productive use in crop irrigation, livestock, aquaculture, rural industries and other commercial uses to improve people’s livelihoods in rural areas through increasing the storage volumes for water for production.

Climatic change is a reality and is having a big impact against the National Development Plans. Effects of extreme weather conditions are being fought through “firefighting” responses which in most cases are uncoordinated and leave little positive impact on the ground. In terms of climatic variations, the water sector is facing a major challenge in terms of prolonged droughts and unexpected floods and it is in this regard that the Ministry is promoting development of bulk reservoirs and creation of adequate storage as water security to withstand long droughts and flood mitigation for some areas.

A lot of effort has been put in construction and rehabilitation of earth dams and valley tanks across the Country especially along the cattle corridor to increase the water storage. To reduce dependency on rain fed agriculture, irrigation schemes have been reconstructed/rehabilitated all aiming at increas-

ing water coverage for crop production, livestock and human consumption.

The Ministry promotes individual farmers through hire of Ministry earth moving equipment for construction of valley tanks at subsidized rates under the Public Private Partnership arrangement.

For sustainability of the facilities, appropriate management systems are established and capacity built for key stakeholders in water for production. Finally, MWE plays an important role of technical backstopping to Local Governments and line Ministries such as Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Office of the Prime Minister (OPM).

What is Water for Production?

Water for Production (WfP) refers to development and utilization of water resources for productive use in crop irrigation, livestock, aquaculture, rural industries and other commercial uses.

The Ministry of Water and Environment is undertaking several programmes in the development and utilization of water resources for productive use in crop irrigation, livestock, aquaculture, rural industries and other commercial uses to improve people’s livelihoods in rural areas through increasing the storage volumes for water for production. This is being done through construction of medium irrigation schemes, small scale irrigation schemes, earth dams, valley tanks, deep boreholes and bulk water schemes.

The livelihoods perspective

This magazine follows a “livelihoods approach” to development. A livelihood may be defined as the sum of ways in which households obtain the things necessary for life, both in good years and in bad. These necessities include food, water, shelter, clothing and health care (with education often included too). Pertinent activities can include crop and livestock production, fishing, hunting, gathering, bartering, and other endeavors and income generating activities (including off-farm work).

Any water intervention needs targeting not only according to farming systems but also according to socio-economic categories. Identifying different categories of farmers according to the level of their integration into the local economies is necessary in order to ensure the effectiveness of interventions. In addition, other context related criteria according to the stage of food self-sufficiency / food security, the share of income from agriculture, and gender are also relevant. In methodological terms, the complexity of the new rural reality reinforces the need for a livelihoods approach to development. In terms of water, this “means a fundamental shift beyond considering water as a resource for food production to focusing on people and the role water plays in their livelihood strategies.

Earning a living through Agriculture in Uganda

Agriculture remains the mainstay of Uganda’s food security at both the household and national levels, and has been a significant contributor to GDP (24%), to export revenues (about 43%) as well as providing a livelihood for over 70% of the population (UBOS, 2015). Water is a key ingredient in Agricultural production and productivity. Currently the agricultural production in Uganda is overly dependent on rain. This conventional rain-fed agricultural production is presently threatened by climatic changes resulting in poor crop and livestock production and reduces livelihood revenues accruing from the agricultural sector. Farmers have continued to grapple under the effects of climate change due to over reliance on rain-fed agriculture though there is great potential to harness the available water in order to increase agricultural production and productivity. Water demands for irrigated agriculture are expected to grow exponentially in coming years as climate change perpetuates unreliable rainfall patterns. Securing availability of water for agriculture will guarantee food security and the livelihood of the residents, including the most vulnerable groups and addresses the need of the very poor in society. Up-scaling irrigated agriculture in Uganda is therefore crucial. Surface water bodies such as rivers, valley tanks, dams, reservoirs and lakes can therefore be exploited to supply water for irrigation.

Water for Production Institutional Framework

The current mandate for the implementation of water for production in Uganda is a shared responsibility between MWE and MAAIF. MWE is responsible for off-farm interventions which refers to development of hydraulic infrastructure and associated engineering works comprising of water abstraction and conveyance to farm gates and infrastructure management. MAAIF is responsible for on-farm aspects of implementation which refers to development of hydraulic infrastructure, associated engineering works and irrigation accessories comprising of conveyance from farm gates to farmers' fields and water use management.

Justification for Water for Production

Uganda's Vision 2040 and National Development Plan II (NDP II) recognize agriculture as being a central sector to the country's food security, economic growth, income enhancement and employment. However, with effects of climate change and the increasingly unreliable rainfall pattern, the need for investment in irrigation and climate resilience has become of paramount importance. Only about 0.5% of the irrigation potential of Uganda has been exploited presently. The GoU has therefore, ranked irrigation as the third most important infrastructural investment that will facilitate economic transformation of the country as envisaged under Vision 2040.

The Vision 2040 clearly lists irrigation as a high priority and stipulates that the country will substantially scale up investment in irrigation development, smart-agriculture and agribusiness development to move the Uganda peasants from subsistence cultivation (majority at present) into modern commercial farming to increase production, productivity and farm income.

The Vision 2040 also targets universal coverage at the yard for very household. While the target for safe water coverage has clearly been defined as 100% by the year 2040, the records on water supply coverage currently indicate that 30% of the districts have the water coverage value below the national average. It is therefore important that investments in rural water provision are scaled up to accelerate water coverage in line with the targets of the Sustainable Development Goals as Uganda works towards achieving the middle-income status by 2040.



Hon. Sam Cheptoris
Minister of Water and Environment



Hon. Ronald Kibuule
State Minister Water



Hon. Kitutu
State Minister, Environment



Mr. Alfred Okot Okidi
Permanent Secretary, Ministry
of Water and Environment

The National Irrigation Policy



The Cabinet of Uganda noted the need for the development of the National Irrigation Policy, and directed the two Ministries of Water and Agriculture to develop, publish and widely disseminate the National Irrigation Policy.

The GoU developed a National Irrigation Policy which targets to expand irrigation infrastructure in order to increase the total agricultural land under irrigation from the current 14,418ha to about 1.5 million hectares by 2040. The Policy has prioritized the enhancement of investments for irrigation development by public, private and other players, and also the provision of reliable water for irrigation to optimize, intensify and diversify crop production and productivity among its strategic objectives. To support the country's development priorities as highlighted in the NDP II, the development objectives of this project will focus on increasing agricultural productivity of small scale rural farmlands.

The Policy Vision is

Agricultural Transformation through Irrigation Development

Implementation of this policy shall be a joint responsibility of Ministries in charge of Agriculture and Water. The Ministry in charge of Agriculture shall be responsible for on-farm aspects of implementation which refers to development of hydraulic infrastructure, associated engineering works and irrigation accessories comprising of conveyance from farm gates to farmers' fields and water use management. The Ministry in charge of water shall be responsible for off-farm interventions which refer to development of hydraulic infrastructure and associated engineering works comprising of water abstraction and conveyance to farm gates. Both Ministries will jointly provide guidelines to support implementation.

The National Irrigation Policy will enhance food and livelihood security and reduction of poverty. Irrigated agriculture can significantly reduce key production risks associated with unreliable rainfall and hence raise farmers' incomes. With developed/improved irrigation infrastructure and water management, paddy yields on an average can increase from 1.8 tons per hectare to 4.5 tons per hectare. In other trials, irrigation enhanced maize production from 2.0 tons per hectare to 8 tons; 15.6 tons for vegetables to over 30 tons per hectare, on average, and in just two seasons. Higher production rates can be realized. In addition, reliable irrigation service

delivery can also persuade farmers to invest in better production practices and to diversify into higher value farming systems. It is estimated that about 3 million hectares of land could be brought under irrigated agriculture if the full potential of irrigation was exploited. This would increase agricultural productivity and mitigate climate change effects. In essence, extensive adoption of appropriate irrigation technologies and best practices by agricultural entrepreneurs is urgent not only because of threats to food security and increased incomes but also for mitigation of impacts of climate change. Government will step-up collective voluntary and state co-ordination; strengthen land rights, promote multi-purpose and integrated irrigation systems and ensure an efficient and effective management of irrigated agriculture.

Policy Objectives

The objectives of this policy are to:

- i. Enhance investments for irrigation development by public, private and other players;
- ii. Promote Integrated Water Resources Management approach in irrigation planning, development and management;
- iii. Ensure that irrigation planning and development is technically feasible, economically viable, socially desirable and environmentally sustainable;
- iv. Strengthen institutional capacity at all levels for coordination, planning, development and management of irrigation systems to ensure efficient water use and functionality of irrigation schemes;

- v. Promote the generation and utilization of irrigation research, innovations, technologies and technical support services; and
- vi. Ensure reliable water for irrigation to optimize, intensify and diversify crop, livestock and fisheries production and productivity

Policy Guiding Principles

The following will be the main policy guiding principles:

- i. **Integrated Water Resource Management (IWRM):** The policy will support integrated planning, development and management of water resources for multiple uses. This will be based on Integrated Water Resource Management (IWRM) principles.
- ii. **Demand Driven Irrigation Development and Management:** The government shall ensure provision of irrigation services through demand driven approaches in which users are fully involved and contribute to the cost of facilities and services to promote ownership and sustainability. Government will prioritize provision of support with feasible investment profiles through a targeted subsidy for progressive and organized farmers groups.
- iii. **Commercial and Market Orientation:** Government shall ensure that irrigation technologies support commodity value chain development of strategic commodities in the different zones in order to develop viable agro-industri-

al centres. Government shall continue to increase awareness and mobilize communities on the value of commercial agriculture to change mind set to achieve a common goal and foster socio-economic transformation by focusing on specific enterprises of maximum opportunity for wealth creation in a particular zone.

- iv. **Producer, Public and Private Partnership (PPPP) Arrangements:** The Government of Uganda is pursuing a private sector led and market oriented economy. Government shall support existing and form new partnerships with the producers and private sector. Government interventions shall ensure involvement and participation of all key stakeholders in irrigation at all stages right from formulation of interventions, implementation, monitoring and evaluation of the strategies, programmes and projects. This will foster ownership and sustainability of irrigation infrastructure.
- v. **Environmental Principles:** Government shall ensure that key natural resources including water resources, air, wetlands, land/soils and environment are sustainably protected, used and managed to support irrigation and other uses. The focus shall be on precautionary, preventive and mitigation approaches to pollution and other adverse environmental conditions associated with human activities and climate change. The policy shall ensure that best practicable environmental options including

water/wastewater reuse, recycling, reduction and precautionary measures to minimize potential risks. Emphasis shall be made on pollution prevention at the point of use (on-farm) and control (after water use).

- vi. **Gender and Equity:** Government interventions in irrigation will promote balanced growth across different regions, gender, establishing large, medium and small scale schemes in different parts of the country and agricultural zones. Government shall pay special attention to parts of the country with special needs (water stressed areas) and to vulnerable or marginalized groups.
- vii. **Water use Efficiency:** Promotion of water use efficiency, irrigation system efficiency of producing with less water and economic measures. The use of water efficient irrigation technologies and practices shall be promoted.
- viii. **International Obligations in use of shared Water Resources:** Irrigation development shall conform to international obligations on shared water resources.
- ix. **Technologies and Irrigation Potential:** Appropriate technologies for sustainable irrigation development and management will be prioritized based on studies, developed beneficiary selection criteria and the established irrigation potential In mountainous areas like

the Rwenzori, Elgon, Agoro and Kigezi hills, gravity fed systems based on abstraction from existing rivers, streams or any other surface water sources such as strategic Reservoirs/Dams shall be prioritized in the provision of water for irrigation. Utilization of the Nile waters for irrigation shall also be explored where found to be the most feasible available option. Other water stressed areas of the country like the cattle corridor shall be served by the most economically and technically feasible water for irrigation systems.

Energy sources shall include hydro, solar, wind, gasoline and thermal. The most feasible energy option based among others on ease of access, investment and operational costs, environment, safety shall be adopted for abstraction of water for irrigation. This will be informed by the National Irrigation Master Plan (NIMP).

- x. **Categories of beneficiaries of this Policy:** The policy shall benefit all actors along the selected value chains under irrigated agriculture. The largest group of beneficiaries will be the organised smallholder farmers who will either be supported under medium-large, small scale and micro-irrigation interventions. The policy shall also support individual progressive and commercial farmers. Other private sector actors will also be supported directly or indirectly along the various crop value chains selected for irrigated agriculture. Beneficiaries of irrigation facilities will be organised

under Water Users' Associations (WUAs) and/or any other documented Best Practice Management systems.

- xi. **Land and Water Resources:** The irrigation sub-sector is characterized by low investments in planning, development, operation and maintenance by both the public and private sectors. This is aggravated by limited access to agricultural finance by farmers and high initial capital investment requirements for development of irrigation infrastructure in terms of land and water resources. A clear mechanism on land access and use will be adopted in accordance with the existing legal and policy frameworks.

Technical Descriptions

Irrigation is the application of a specific amount of water in order to meet the requirements of a crop growing in amounts that are appropriate to the crops 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.

Irrigation Schemes are categorized into four types: - Micro Scale Irrigation Schemes with less than 5 hectares; Small Scale Irrigation Schemes with 5- 100 hectares, Medium Scale Irrigation Schemes with 100 – 1,000 hectares and Large Scale Irrigation Schemes with greater than 1,000 hectares of irrigated land.

Irrigation Systems are composed of infra-

structure, water, enterprise management, institutional arrangements and human resources for irrigation. The system can be referred to as Irrigation Scheme which supplies irrigation water to farmers, so that they can obtain higher yields than they could without irrigation.

Bulk water is water supplied in large amounts of over 400,000 cubic metres per day through associated infrastructure including dams and reservoirs, surface water (lakes and river) and groundwater intakes, pumping stations, and transmission mains to point of use.

Earth dam is an impermeable structure built across a waterway from rivers, runoff and/or direct rainfall to impound water in a reservoir for flow regulation and use during the period of water shortages.

Valley tank is an excavation reservoir basin for capturing runoff water impounded for use during the period of water shortages.

Windmill watering supply systems are turbines of Kestrel E400 N type designed to convert wind energy into electric energy to power a submersible pump that transmits water to a 20,000-litre aluminium tank on steel tower. Its then delivered by gravity to 3 cattle troughs, 1 goat trough and tap stand with 3 taps.

Off-farm refers to development of water sources and transmission (bulk transfer to farm gates).

On-farm refers to irrigation infrastructure, water use and management.

Commonly asked questions by Stakeholders

Qn: What is WfP Strategy to alleviate the effects of climate change to improve agricultural production?

Ans: The Ministry through water for production department is increasing water supply for livestock watering, crop irrigation, aquaculture through construction of medium and small scale irrigation schemes, earth dams, valley tanks, production wells and bulk water transfer systems. The department has so far created a cumulative storage of 41.124 million m³ countrywide from valley tanks, earth dams and bulk water transfer schemes and has so far covered 15,200 hectares of irrigable area.

Qn: What are the registered achievements from MWE Equipment?

Ans: The first set of Equipment was acquired in 2009 and this has since increased to seventeen (17) sets. Since the inception of this policy, a total of 1,116 valley tanks have been constructed creating a cumulative water storage capacity of 4.4 billion litres.

Qn: Where is the MWE Equipment currently deployed?

Ans: Table illustrating deployment and number of sets per region;

S/N	Region	No. of Equipment
1	Eastern	4
2	Western	7
3	Central	1
4	Northern	4
5	Karamoja	1
TOTAL		17

Qn: Which Districts have benefited from MWE Equipment?

Ans: Table showing number of WfP facilities constructed using Equipment in each District

S/N	District	No. of facilities
1	Bukomansimbi	16
2	Gomba	26
3	Kiboga	53
4	Kyankwanzi	41
5	Kibaale	21
6	Lyantonde	87
7	Luwero	40
8	Dokolo	1
9	Kitgum	1
10	Nakaseke	73
11	Nakasongola	86
12	Mityana	1
13	Mbarara	63
14	Sembabule	91
15	Kiruhura	357
16	Kyegegwa	2
17	Mubende	12
18	Isingiro	33
19	Ntungamo	8
20	Katakwi	1
21	Pallisa	10
22	Amuria	1
23	Rakai	10
24	Abim	12

S/N	District	No. of facilities
25	Kibuku	1
26	Amudat	9
27	Kaabong	11
28	Bukedea	1
29	Kotido	10
30	Moroto	11
31	Nakapiripirt	8
32	Busia	1
33	Tororo	1
34	Napak	9
35	Bugiri	1
36	Soroti	1
37	Kaberamaido	1
38	Kamuli	2
39	Kasese	3
TOTAL		1116

Qn: How do farmers access WfP Equipment?

Ans: Farmers can easily access the WfP Equipment at the decentralized WfP Regional centres of; West (Mbarara), Central (Wakiso), North (Lira), East (Mbale) and Karamoja (Moroto). The Department together with Districts carry out stakeholder engagement activities such as mobilization, sensitization and capacity building to raise awareness to farmers about access to WfP equipment, payment for equipment, effective use of equipment and operation and maintenance of the equipment. MWE/WfP together with Districts form an Equipment coordination committee at District and Sub-county levels for coordination, monitoring and supervision of Equipment activities. So far, the committees were formed in Mbarara, Isingiro, Lyantonde, Sembabule and Kyankwanzi.

Qn: How does Water for Production acquire land for its facilities?

Ans: Construction of WfP facilities require big pieces of land especially for the irrigation schemes, bulk water schemes, dams and valley tanks. For example, for the case of irrigation schemes, the Ministry acquires land for the construction of the major infrastructure such as water reservoirs, major canals, weirs, scheme roads and administration blocks.

The required land is acquired through the participatory stakeholder engagement which includes awareness creation, obtaining Project consent from hosting Districts and beneficiary communities, survey and valuation of land, effect payment and titling of acquired land for the project.

Qn: How does a community qualify to have a small scale irrigation scheme?

Ans: At the old WfP facilities, farmers are mobilized and encouraged to provide land near the facility for the construction of small scale irrigation schemes through the farmer field school approach. For the new sites, farmers come together as a group and apply for the small scale irrigation schemes indicating availability of land and willingness of farmers to operate and manage their scheme.

A conditional assessment is undertaken by the WfP technical team to identify the water source (nature and availability), beneficiaries, land suitability and availability, crop production potential, operation, maintenance and management and technical feasibility.

Qn: What is MWE's Institutional Role in increasing national incomes?

Ans: Our main role is to increase productivity. When you increase water, then you increase productivity in the country, for instance Egypt's productivity is six times more than that of Uganda yet it is a dry country. This is possible because water is harvested and put into good use and therefore farmers are able to produce throughout the year. It is the Ministry's role to put water into good use to boost productivity.

Qn: How does a farmer in Moroto District in Karamoja region easily access Water for Production services?

Ans: Water for Production department decentralized its activities to all regions in the Country. WfP regional offices

are at the Ministry of Water and Environment regional offices located as follows; Western Uganda (Mbarara District), Central Uganda (Wakiso District), Northern Uganda (Lira District), Eastern Uganda (Mbale District) and Karamoja region (Moroto District).

Qn: What are some of the challenges you have faced in the implementation of the whole project?

Ans: Due to climate change, there is more need for water for production i.e. for livestock watering, crop production, aquaculture and industries and yet the funding is limited. For example, according to the National Irrigation Policy, the Ugandan irrigation potential is 3.03 million hectares and it requires a lot of investment in irrigation to hit this potential. The Government however is prioritizing funding of water for agricultural production to address the above mentioned challenge.



Impact of Water for Production on people's Livelihoods

The WFP department has registered great impact through implementation of various projects to improve people's livelihoods such as;

1. Implementation of Medium scale irrigation schemes
2. Implementation of Small scale irrigation schemes
3. Implementation of Public Private Partnership (PPP)
4. Implementation of Earth Dams and Valley Tanks
5. Implementation of Production Wells in Karamoja Region
6. Capacity building for farmers to manage the schemes and practice improved and modern agriculture
7. Involvement of vulnerable groups in water for production activities

1. Improving people's livelihood through implementation of medium scale irrigation schemes

The Government of Uganda through the Ministry of Water and Environment (MWE) has

exploited 2,646 hectares of irrigation potential across the country through the rehabilitation of four (4No.) Medium sized irrigation schemes which include Doho I in Butaleja district, Mubuku I in Kasese district, Olweny in Lira District and Agoro in Lamwo district. The government is implementing five (05) other medium sized schemes; Mubuku II in Kasese district (480 ha), Doho II in Butaleja district (1,178 ha), Wadelai in Nebbi district (1000 ha), Tochi in Oyam district (500 ha) and Ngenge in Kween district (500 ha).

Registered success

Table 1 illustrates the success story of the completed medium scale schemes before and after MWE intervention;

Management of Medium and Large Scale Irrigation Schemes

Medium scale irrigation schemes are managed through cooperative societies in coordination with Irrigation water user associations, water user committees, Farmer Field

Table 1: Success story of the completed medium scale schemes

Irrigation Schemes	Districts	Hectares	No. of beneficiary households	Yields before MWE Intervention	Yields after construction/ reconstruction of the irrigation scheme
Mubuku I, Doho I, Olweny and Agoro	Kasese, Butaleja, Lira and Lamwo	1,800	5,000	700 tons per ha per season	1800 tons per ha per season
Total		1,800	5,000	700 tons per ha per season	1800 tons per ha per season

Schools, Irrigation Service Operator, District Technical Committee and WfP Regional centers.

- An Irrigation Water User Association (IWUA) for all farmers is formed. The IWUA is responsible for all the irrigation infrastructure of the scheme including those IWUA manages through Irrigation Service Operator (ISO). To ensure efficient and effective performance, IWUA can hire or recruit technical support members to be part of the team and the members are paid by IWUA.
- The IWUA draws its authority from the membership—General Assembly of all Scheme Water Users, which elects office bearers—Executive Committee.
- The MWE – WfP Regional Centres play the supervisory role and oversee operations of IWUA.
- The District technical committee play the back-up and supervisory role.
- IWUA is responsible for collection of Irrigation Service fees that are deposited on a General Account of IWUA with representative of MWE-WfP Regional Centres among the Principal Signatories. The funds for the management, operation and maintenance for off-farm infrastructure and for payment of the Irrigation System Operator are drawn from this account.
- IWUA also operates an ESCROW Account with representative of MWE-WfP Regional Centres among Principal signatories to keep 10% of total collections for reinvestment.
- Water User committees (WUCs) at the block level are established as structures of IWUA to aid easy mobilization of farmers
- The Water User Committees at the block level are responsible for the mobilization of farmers for the collection of Irrigation Service fees through the following payment modalities:
 - ❖ Direct cash payment by farmers into the IWUA account. Farmers will bring receipts to the WUC. No cash payments will be made to individuals.
 - ❖ Farmers provide in kind seasonal produce equivalent to the Irrigation Service fees to the IWUA. The IWUA sells the collected equivalent produce to the Cooperative on agreed terms.
- The IWUA signs an MOU with the cooperative for the purchase of farmers produce, purposely for payments towards Irrigation service.
- The WUC is responsible for ensuring effective collection of both cash and in kind of water irrigation service fees.
- Cash is deposited by individual farmers on the Escrow Account of the IWUA and furnish bank slips to the IWUA.
- Produce in kind, is delivered to the Cooperative store as grain belonging to IWUA for selling to the Cooperative or any other buyer.
- The WUC furnishes the IWUA with Goods Received Note for produce received by the cooperative.
- A collection Account is operated by IWUA, with a representative of MWE-WfP Regional Centre among the Principal

signatory.

- 10% of the collections is reserved on ESCROW Account for reinvestment.
- 90% of the collections remain on the General Account to facilitate the activities of the FBMOs (IWUA, WUC & FFS), payment of ISO and emergencies.
- The Irrigation Service Operator (ISO) is recruited by the MWE/WfP-Regional office with the support of the District and is paid by the IWUA as operational support to run the system for the farmers. The ISO reports to the IWUA.
- Major repairs are done by MWE while minor ones are done by the ISO including replacing stolen items e.g. Control Gates.
- System reconstruction plan is prepared by ISO, reviewed and approved by MWE and consented to by IWUA.

Categories of project beneficiaries of a medium scale Irrigation Schemes

There are a number of beneficiaries at the scheme i.e.;

- The direct beneficiaries are the farmer groups who participate in farm activities to improve their livelihoods and also acquire new knowledge on modern farming practices.
- The Financing groups (SACCOs) where farmers borrow money for farming.
- The training farms who are hired to train farmers on improved agriculture practices and financial management skills.
- Hired labour at the scheme and farms for skilled and unskilled labor.
- Community members, who come to the farm, learn and transfer Knowledge to their gardens back home.
- Markets where farmers buy their inputs such as fertilizers, pesticides and seeds.



Construction of Medium Scale Irrigation Schemes



Ground breaking Ceremony for Tochi Irrigation Scheme in Oyam District

a) Completed medium scale Irrigation schemes





Dairy Section at Mubuku I Irrigation scheme

b) Ongoing construction of medium scale Irrigation schemes

i) Tochi Irrigation Scheme in Oyam District



ii) Wadelai Irrigation Scheme in Pakwach District





iii) Ngenge Irrigation scheme in Kween District



iv) **Doho II Irrigation scheme in Butaleja District**



Impact of Irrigation on the existing Water for Production facilities in Karamoja Sub-region (Longoromit and Arechek earth dams)



Improving people's Livelihoods through Implementation of Small scale irrigation schemes

Ministry of Water and Environment is implementing small scale irrigation schemes through water for production regional centers (Central, North, West, East and Karamoja) with an aim of improving peoples' livelihoods

Ministry of Water and Environment (MWE) under Water for Production department completed construction of forty four (44) Small Scale Solar Powered Irrigation Systems in the Districts of Nwoya, Zombo, Lira, Pakwach, Gulu, Omoro, Alebtong, Oyam, Arua, Adjumani, Soroti, Abim, Napak, Kaabong, Iganga, Pallisa, Mayuge, Kamuli, Bukedea, Tororo, Katakwi, Amuria, Ngora, Rukiga, Isingiro, Lwengo, Mukono, Kiboga, Masaka, Kabarole, Butambala, Gomba, Masaka, Mbarara, Isingiro, Bushenyi, Kyankwanzi, Mityana and Kasanda. This intervention has created an additional 352 acres of the country's irrigation potential. For each of the communal WFP facilities constructed, a sustainable Farmer Based Management Organization (FBMO) is established and trained to effectively operate and maintain the infrastructure and facilities.

Works are ongoing for construction of thirty eight (32) Small scale Irrigation schemes in the Districts of Agago, Zombo, Oyam, Nakaseke, Dokolo, Kitgum, Bukwo, Kaberamaido, Serere, Soroti, Napak, Manafwa, Busia, Kibuku, Mbale, Kaabong, Manafwa, Kapchorwa, Amuria, Ntoroko, Ibanda, Ntungamo, Kalungu, Kagadi, Bushenyi, Kisoro, Wakiso,

Rukungiri, Kamwenge, Kyenjojo, Kabarole and Kyegegwa.

Furthermore, the Ministry has completed designs of thirty two (32) Small scale Irrigation systems in the Districts of Buhweju, Isingiro, Bunyangabu, Rukungiri, Kanungu, Kyankwanzi, Buvuma, Hoima, Kibaale, Kalangala, Mpigi, Rakai, Ibanda, Rubirizi, Kanungu, Rukungiri, Ntungamo, Rubirizi, Sembabule, Mpigi, Gomba, Gombe, Butambala, Buhweju, Rukiga and Bunyangabu.

Feasibility studies are being undertaken for construction of nineteen (19) small scale irrigation schemes in the Districts of Namayingo, Buyende, Bukwo, Soroti, Abim, Serere, Kumi, Kapchorwa, Manafwa, Bukedea, Mbale, Soroti, Bududa, Bududa, Arua, Maracha, Lira and Agago and Buyende.

Management of Small Scale Irrigation Schemes

Farmers' Associations manage the utilization, management, operation and maintenance of the irrigation scheme.

Farmers' association:

- Registration with the Sub-counties for a certificate of registration.
- Members contribute to annual subscription.

- Farmers contribute a percentage of their sales from the produce for maintenance and operation as well as re-investment for the sustainability of the system.
 - The farmers attend trainings and other capacity building programs by the Ministry/District/Sub-county and other Government or development authorities.
 - The land is not allocated to farmers for a lifetime and continuity depends on their performance.
 - A joint Farmer Group account is recommended. The farmers deposit contributions for Operation and Maintenance and for reinvestment after every harvest.
 - The Farmer Association Executive is responsible for the allocation and management of the farmland in consultation with MWE.
 - The Association formulates bye-laws, approved by the Sub-county to enable effective and efficient utilization, management, as well as operation and maintenance of the system on a sustainable basis.
 - A user agreement (MoU) between MWE, the District Local Government, and the beneficiary farmers is made so that the roles of each parties are fulfilled.
2. Vice Chairperson
 3. Treasurer
 4. Secretary for production and marketing
 5. Secretary for water
 6. General Secretary
- b) Operational/support staff (Employed and paid by Farmers' Association).
1. Scheme attendant
 2. 2No. caretakers /Guards
- The farmers currently meet the allowances of the scheme attendant and two (02) caretakers on a monthly basis from members' annual subscriptions. However, after harvest, the contributions from sales towards O&M will be used to meet the allowances of the operational staff.

Categories of project beneficiaries of a Small Scale Irrigation Scheme

- The direct beneficiaries are the beneficiary farmer groups who participate in farm activities to improve their livelihoods.
- Indirect beneficiaries are other community members who come to the farm, learn and transfer Knowledge to their gardens back home. They can also be community members whose livelihoods are changed because of the project.

The Management structure of Small Scale Irrigation Scheme:

- a) Executive (voluntary)
1. Chairperson

Benefits of the project

- Improved yields; with irrigation, farmers

IMPROVING LIVELIHOODS
THROUGH WATER FOR PRODUCTION

are expected to cultivate 3-4 subsequent seasons of harvest in one year. Therefore, production would be increased for increased food security and household incomes.

- The system would also facilitate Capacity building of farmers.
- Farmers attain training in Marketing skills and Market Models
- It encourages crop diversification both to improve the nutritional status of families and so that the farmers might earn some income from selling produce.



Pictorial of some of the completed Water for Production facilities

a) Iwemba Small Scale Irrigation scheme

The scheme is in Iwemba Sub-county, Nabirere Parish in Bugiri District. It covers 6 acres. The Water User Committee (WUC) has 9 members, Women's group has 20 members and the Youth group has 15 members.



Nursery bed, behind is a prepared garden ready for planting



Interview with one of the members of the farmer groups



Tomatoes after harvest



Onions after harvest

b) Ojikai Small Scale Irrigation Scheme

The scheme is located in Kamuda Sub-county, Agora Parish in Soroti District. It covers 10.8 acres. The Women's group has 13 members, Youth group (Agama) has 12 members, Youth group (Ojikai) has 12 members, men's group has 10 members and there are 3 Model farmers.



Water source and Abstraction system



Water Storage tanks for irrigating the gardens



Farmers after harvesting onions



A prepared onion garden

c) Lutuk small scale irrigation system

The scheme is located at Lutuk village, Kal B Parish, Koch goma in Nwoya District. It covers 10 acres. The source of water is a motorized borehole. The Farm management association has 46 members. The crop enterprises include tomatoes, cabbages, onions, green pepper, carrots, and eggplant.



Irrigation of tomatoes



Storage in overhead tanks for irrigation



The scheme sanitary facility



Fenced irrigation system to provide security

d) **Opwach small scale irrigation system**

The system is located in Opwach village, Gem Parish, Lalogi Sub-county in Omoro District. The source of water is a motorized borehole. 75 members categorized in 14 sub-groups. The crop enterprises include; tomatoes, onions, water melon, cabbages, green pepper, garlic, eggplant, okra, collards, and pumpkins.



Fencing of the irrigation systems at Opwach completed



Cabbage garden under irrigation at Opwach SSIS



Watermelon fruits ready for harvest at Opwach SSIS



Completed lined VIP latrine at Opwach SSIS

e) **Kyassonko Small scale Irrigation Scheme**

The scheme is located in Kiseka Sub County, Busubi Parish in Lwengo District. The water source is Kyoga swamp. It covers 20 acres. The Water User Committee (WUC) has 5 members, Women's group has 35 members.



Cabbage garden at Kyassonko SSIS



Fenced off Solar panels and a power house



Tank Reservoirs for the Irrigation system



Prepared garden ready for planting with drip lines

f) **Nyamihanga Small Scale Irrigation Scheme**

The scheme is located in Bukinda S/C in Rukiga District. It covers 20 acres. The water source is a swamp. The scheme has two groups of farmers and the model farmer identified by the president from him the Kabale model was adopted.



Nyamihanga Sprinkler irrigation system



Preparation of the garden at Nyamihanga SSIS



Preparation of the Nursery bed



Ongoing irrigation of Irish potatoes

Improving farmers' livelihoods through Public Private Partnership

As one of the interventions to increase storage, MWE procured equipment for construction of valley tanks to be accessed by farmers and other organizations to construct WfP facilities at subsidized price. The first set of equipment was deployed to Kiruhura in 2009 and to-date, the sets have increased to seventeen (17). A total of 1,116 valley tanks with cumulative storage of 4.4 billion litres in 39 districts namely Bukomansimbi, Gomba, Kiboga, Kyankwanzi, Kibaale, Lyantonde, Luweero, Dokolo, Kitgum Nakaseke, Nakasongola, Kasese, Mityana, Mbarara, Sembabule, Kiruhura, Kyegegwa, Mubende, Isingiro, Ntungamo, Katakwi, Pallisa, Amuria, Rakai, Abim, Kibuku, Amudat, Kaabong, Bukedea, Kotido, Moroto, Nakapiripirit, Busia, Tororo, Napak, Bugiri, Soroti, Kaberamaido and Kamuli have been constructed using the WfP equipment.

De-concentration of WfP Equipment Activities

To bring services nearer to the communities, since May 2018, MWE has deconcentrated its activities with Equipment operations inclusive to regional levels, with their offices within the established Ministry of Water and Environment offices of; Mbale for the Eastern region, Moroto for Karamoja Sub-region, Lira for the Northern and West Nile region, Wakiso for Central region and Mbarara for Western Region.

WfP Equipment registered success

MWE has been developing facilities under a PPP arrangement with private farmers. Management of these facilities is purely by the private owners. To-date, 1,006 valley tanks have been constructed under this arrangement since 2008. Firstly, there is no question of ownership as each facility is privately owned by an individual farmer. All the facilities constructed are fenced and there is no direct watering of animals at the facilities. The use of both traditional and modern troughs is high, access to the facilities is no longer a problem, functionality rates are high and care of facilities is commendable, silting of facilities is limited, cleanliness at the facilities is high and this arrangement has also minimized the challenge of livestock diseases.

Construction of WfP facilities using Ministry Equipment



Valley tank in Masha sub-county in Isingiro District



Canon George Mugisha valley tank constructed in Mbarara District



Excavation of an inlet for a valley tank in Kyegegwa District



Changing engine oil of a Komatsu Bull dozer

Valley tanks excavated on Individual farms in Kiruhura District



Improving Farmers' Livelihoods through Construction of Earth Dams and Valley Tanks

The department has created cumulative storage of 41.124 million m³ countrywide through construction of valley tanks and earth dams. Construction of valley tanks and earth dams has addressed problems related to water scarcity and drought such as cattle keepers moving long distances in search of water and pasture especially in the cattle corridor areas during the dry spell.

Availability of water for livestock has a great impact such as;

- i) Reduced death of animals due to drought
- ii) Increased diary production
- iii) Improved quality of beef, since animals no longer move very long distances in search for water
- iv) Improved quality of animals
- v) Reduced transfer of livestock diseases

This has increased production, thus leading to improved livelihood of farmers.

Management of Earth dams and valley tanks

To ensure sustainability of the earth dams and valley tanks, WfP department stepped up facilities' management, operation and maintenance and effective utilization of the created storage. Management of these facilities is through Farmer Field Schools (FFS) Approach that includes;

- (i) Strengthening knowledge and capacities for climate change adaptation.
- (ii) Strengthening skills in operation, maintenance and management of water for production facilities at communal and individual level.
- (iii) Better access of livestock and crops to water through training in water management.
- (iv) Resilience of Livestock and crop production systems in the cattle corridor.
- (v) Establishment, training and integration of FFS with community based water management system on sustainability, operation and maintenance of water for production facilities.
- (vi) Saving and marketing. Integrated and modern agricultural practices.
- (viii) Strengthen collaboration, monitoring, supervision and networks among the farmers within FFS.

The FFS have both men and women, and these FFS groups are trained in the areas of; Livestock nutrition and pasture conservation, Livestock disease management, Improved management of poultry and small ruminants, Integrated pest management of common crops, Soil and water conservation, Climate smart technologies i.e. simple and cost effective irrigation methods, Post-harvest handling and management, Livelihood and entrepreneurial skills in farming as a business, savings mobilization and Group marketing of

their bulk products.

This has led to increased production, easy marketing of products and improved livelihoods of the people around the facilities. Through this, the created storage in the valley tanks and earth dams is put to effective use and out of the collected money from the sale of the agricultural products 5% is saved for operation and maintenance of the facilities.

a) Completed Earth dams



Construction of Communal valley tanks



Kinoni valley tank in Mubende District



Solar Abstraction system and water reservoir at Lwenyana Valley tank in Nakasongola District



Cattle troughs, Storage tanks and a fenced water reservoir at Bamusuta Valley tank

Improving Farmers' Livelihoods through Construction of Production Wells in Karamoja Region

a) Lolachat windmill powered watering supply system

The water system is located in Lotaruk Parish in Nabilatuk District and is functional with 3.4 m³/hr borehole. Caretaker and water user committee were yet to be selected on this site.



Windmill turbine was functional mounted on 12 m tower



3.4 m³/hr yield borehole with submersible Grundfos pump



Reservoir was functional with no leakages observed



Tap stand with three (3) taps was functional

b) Awach windmill powered watering supply system

It is located in Abim District. It is functional and has a bore hole yield of 2.5 m³/hr.



Illustration of the constructed troughs and livestock watering



An installed Windmill turbine



Functional water storage reservoir

Impact of Irrigation on the existing Water for Production facilities in Karamoja Sub-region (Longoromit and Arechek earth dams)

Impact of Farmer Field Schools (FFS) on communities with Water for Production facilities



Farmers preparing a kitchen gardens at Ongole dam in Katakwi District



Kitchen garden still under preparation



Kitchen garden of FFS in Kole District



Members of FFS at Mabira dam in Mbarara District weeding cabbages



Members of FFS at Kagamba valley tank in Isingiro District after receiving farming inputs



Nursery bed of a FFS near Kagera valley tank in Kiboga District

Improving farmers' livelihoods through building farmers' capacity to practice improved and modern agriculture

To ensure sustainability of the WFP facilities beneficiaries are trained on operation and management measures, management structures are established and farmers are trained on improved and modern farming practices at all the WFP facilities.

The farmer field school approach brings farmers together in groups of different agricultural enterprises such as vegetable/crop production, livestock, bee keeping, fish farming and trained on improved practices, financial management and marketing as a group.

Cooperative societies have enabled farmers to produce and market products in bulk thus attracting bigger and better markets. Farmers learn agricultural skills and financial management skills that have seen the farmers improve their livelihoods.



Communities at Lukaya valley tank in Mubende welcoming Hon. Minister Sam Cheptoris



Chairman LC 1 giving remarks during Farmer Field School Graduation ceremony at Kinoni valley tank in Mubende District



European Union (EU) Delegate addressing farmers at Kinoni Valley tank in Mubende District



FFS demonstration in Nakasongola



Hon. Ruth Nankabirwa and Commissioner W/P in Kiboga at FFS graduation ceremony



Hon. Ruth Nankabirwa inspecting farmers produce in Kiboga at FFS graduation ceremony



Hon. Minister MAAIF, FAO Delegate and MWE representative at FFS graduation ceremony in Luweero District

Improving farmers' livelihoods through active encouragement, involvement and participation of vulnerable groups in farming activities

The department has designed strategies to encourage the elderly, the youth, women and people with disabilities to actively participate in water for production activities. Through farmer field schools, farmers are grouped in categories of youth, elderly and women and priority enterprises such as crop production, aquaculture, livestock, poultry farming e.t.c. This aims at encouraging all categories to actively participate in farming and thus improve on their livelihoods as they save money for operation and maintenance of the WfP facilities.



Farmers training

WfP-Regional Centre–North talking to teachers and pupils on the Benefits of small scale Irrigation Schemes through charity works



Water for Production Regional Centre-North (WfP-N) donated 100 Reading books to Little Rock Nursery School in Lira District near Water and Sanitation Development. Facility-North (WSDF-N). The Staff of WfP-N promised to always visit the school in their free time to have reading lessons with them.

Impact of Water for Production facilities



Farmers after harvesting in Eastern Uganda



Gardens prepared with some crops under Irrigation



Gardens prepared with some crops under Irrigation

Different Abstraction systems and impact of valley tanks



Irrigation systems (Sprinkler and drip)



Water storage systems





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