



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



Occasional Paper No. 36

# Budget Analysis and Assessment of Investments in Water Smart Agriculture for Smallholders in Uganda and East Africa



**Francis Mwaura, Miriam Katunze, Tony Muhumuza  
and Isaac Shinyekwa**

**September, 2014**





Occasional Paper No.36

# **Budget Analysis and Assessment of Investments in Water Smart Agriculture for Smallholders in Uganda and East Africa**

CARE International in Uganda and Economic Policy Research Centre (EPRC)

September, 2014

**Copyright © Economic Policy Research Centre (EPRC)**

The Economic Policy Research Centre (EPRC) is an autonomous not-for-profit organization established in 1993 with a mission to foster sustainable growth and development in Uganda through advancement of research – based knowledge and policy analysis. Since its inception, the EPRC has made significant contributions to national and regional policy formulation and implementation in the Republic of Uganda and throughout East Africa. The Centre has also contributed to national and international development processes through intellectual policy discourse and capacity strengthening for policy analysis, design and management. The EPRC envisions itself as a Centre of excellence that is capable of maintaining a competitive edge in providing national leadership in intellectual economic policy discourse, through timely research-based contribution to policy processes.

**Disclaimer:** The views expressed in this publication are those of the authors and do not necessarily represent the views of the Economic Policy Research Centre (EPRC) or its management.

Any enquiries can be addressed in writing to the Executive Director on the following address:

Economic Policy Research Centre  
Plot 51, Pool Road, Makerere University Campus  
P.O. Box 7841, Kampala, Uganda  
Tel: +256-414-541023/4  
Fax: +256-414-541022  
Email: [eprc@eprc.or.ug](mailto:eprc@eprc.or.ug)  
Web: [www.eprc.or.ug](http://www.eprc.or.ug)

## ACKNOWLEDGEMENTS

This report was prepared by a collaborative team from Economic Policy Research Centre (EPRC) and CARE International in Uganda through Global Water Initiative East Africa (GWIEA) with financial support from the Howard G. Buffet Foundation. The research team was led by Francis Mwaura, a Research Fellow at EPRC. Other members of the research team included Ms. Miriam Katunze and Dr. Isaac Shinyekwa of EPRC and Dr. Tony Muhumuza (currently with UNDP, Uganda). The team received valuable technical support from the Executive Director of EPRC, Dr. Sarah Ssewanyana, and the Principal Research Fellow Dr. Ibrahim Kasirye. Dr. Mildred Barungi provided a critical review of the report.

The team from the (GWIEA) at CARE International in Uganda who provided their insight during the preparation of this report included Ms. Violet Alinda, Dr. Alan Nicol and Mr. Andrew Lubega. The field data collection was facilitated by a team of CARE members, including Ms. Miriam Imalingat, Mr. Grace Kyokunda and Mr. Patrick Omedi.

The team is also grateful to a large number of respondents who provided information that contributed to this report. The respondents include those working in the ministries of Agriculture Animal Industries and Fisheries (MAAIF), Water and Environment (MoWE), Local Government (LoG) and Office of the Prime Minister (OPM). Others who contributed to the reports include various officers working with private companies, development partners and civil societies. The information that was collected from the farmers and their groups is also highly valued.

## ABBREVIATIONS/ACRONYMS

ACAD	Agricultural Cluster Development
ACBF	African Capacity Building Foundation
ALREP	Agriculture Livelihoods Recovery Program
AU	African Union
BFP	Budget Framework Paper
BIPPS	Bankable Investment Project Profile
CAADP	Comprehensive African Agriculture Development Program
CSOs	Civil Society Organizations
DSIP	Development and Sector Investment Plan
DWD	Directorate of Water for Development
EPRC	Economic Policy Research Center
FAO	Food and Agriculture Organization
FDS	Fiscal Decentralization Strategy
FGD	Focus Group Discussion
FIEFOC	Farm Income Enhancement and Forestry Conservation
Gou	Government of Uganda
Ha	Hectares
ICCO	Inter-Church Organization for Development Cooperation
KALIP	Karamoja Livelihood Programs
LoG	Local Government
LRA	Lord Resistance Army
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MDAs	Ministries, Departments and Agencies
MoFPED	Ministry of Finance, Planning and Economic Development
MoGLSD	Ministry of Gender, Labor and Social Development
MoWE	Ministry of Water and Environment
MTEF	Medium-Term Expenditure Framework
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NIMP	National Irrigation Master Plan
NMTIP	National Medium-Term Investment Program
OPM	Office of the Prime Minister
PAF	Poverty Action Fund
PEAP	Poverty Eradication Action Plan
PFAA	Public Finance and Accountability Act
PMA	Plan for the Modernization of Agriculture
PRDP	Peace Recovery Development Plan
SSIM	Strategic Sector Investment Model
SSIP	Strategic Sector Investment Plan
SWG	Sector Working Groups

UBoS	Uganda Bureau of Statistics
UDN	Uganda Debt Network
UGX	Uganda Shillings
UNDESA	United Nations Department of Economics and Social Affairs
UNCED	United Nations Conference on Environment Development
WAP	Water Action Plan
WfAP	Water for Agricultural Production
WFP	World Food Program
WHH	Welt Hunger Hible
WPC	Water Policy Committee
WESWG	Water and Environment Sector Working Group



## TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b>	<b>I</b>
<b>ABBREVIATIONS/ACRONYMS</b>	<b>II</b>
<b>EXECUTIVE SUMMARY</b>	<b>VI</b>
Methodology	vii
Major findings	vii
Key Recommendations	x
<b>1. INTRODUCTION</b>	<b>1</b>
1.1 Background	1
1.2 Objectives of this study	3
1.3 Study Approach	3
<b>2. WATER FOR SMALLHOLDER PRODUCTION IN UGANDA</b>	<b>5</b>
2.1 Rationale for intervention in WfAP	5
2.2 How does the Uganda WfAP infrastructure compare with that of other EAC states?	9
<b>3. POLICY AND INSTITUTIONAL FRAMEWORKS FOR WFAP</b>	<b>10</b>
3.1 Policy framework	10
3.2 Institutional frameworks	12
3.3 Understanding the drivers of policy shifts in WfAP	14
<b>4. BUDGETING FOR WFAP</b>	<b>16</b>
4.1 Institutional framework and policy guidelines governing the budgeting and implementation of WfAP	16
4.1.1 Legal framework	16
4.1.2 Policy guidelines	16
4.1.3 Sector budget process	17
<b>5. BUDGET PERFORMANCE FOR WFAP/WFAP UNDER PUBLIC SPENDING</b>	<b>20</b>
5.1 Budget allocations and out-turns	20
5.2 Budgeting for Irrigation in the East Africa countries	23
<b>6. WFAP BUDGETING AND IMPLEMENTATION AT THE LOG LEVEL</b>	<b>25</b>
6.1 Otuke district	25
6.1.1 Socio-economic characteristics	25
6.1.2 Rainfall patterns and climatic and soil conditions	25
6.1.3 Crop production	26
6.1.4 Experiences with WfAP interventions	27
6.2 Abim District	29
6.2.1 Socio-economic characteristics	29
6.2.2 Rainfall and climatic and soil conditions	29
6.2.3 Experience with WfAP interventions	30
6.3 District-level institutional framework for WfAP: lessons from Abim and Otuke	31
6.4 Opportunities for financing WfAP in the districts	32
6.5 The trends of public spending at the district level (resource flow from the central government to locally generated resources)	33
<b>7. OPPORTUNITIES AND CHALLENGES FOR INVESTMENT IN WFAP IN UGANDA</b>	<b>35</b>
7.1 Opportunities for Investment in WfAP in Uganda:-	35
7.2 Challenges for investment in WfAP in Uganda	36
<b>8. DEVELOPING A SUSTAINABLE WFAP INFRASTRUCTURE FOR SMALLHOLDER FARMERS</b>	<b>38</b>

8.1	Increasing budget allocation for WfAP to benefit smallholders	39
8.2	Enhancing access of sustainable WfAP for the smallholder	40

**REFERENCES** 42

<b>APPENDIX 1:</b>	<b>AGRO-ECOLOGICAL ZONING IN UGANDA AND CROP RECOMMENDATIONS</b>	45
--------------------	--	----

<b>APPENDIX 2:</b>	<b>LIST OF INDIVIDUAL CONSULTED DURING THE KIIS</b>	46
--------------------	---	----

<b>APPENDIX 3:</b>	<b>CHECKLIST QUESTIONS FOR KEY INFORMANT INTERVIEW</b>	46
--------------------	--	----

**LIST OF FIGURES**

<b>Figure 1:</b>	Incidences of rainfall conditions from 1943 – 1999, %	6
<b>Figure 2:</b>	Share of selected crop losses at the household level due to drought in 2005, %	7
<b>Figure 3:</b>	Status of the water resource availability and access in Uganda in 2008 (m <sup>3</sup> /person/year)	9
<b>Figure 4:</b>	DSIP five-year proposed budget for water for agricultural development, UGX Billion	17
<b>Figure 5:</b>	Budget allocation vs out-turns 2006/7-2012/13	20
<b>Figure 6:</b>	Percent recurrence vs development of the approved and outturned budgets	21
<b>Figure 7:</b>	WfAP Budget as a % of the GDP	22
<b>Figure 8:</b>	WfAP budget allocations to key ministries in Uganda between 2007/8 and 2012/13	23
<b>Figure 9:</b>	Comparisons of the Government and Development Partners' contribution to WfAP, UGX billions	24
<b>Figure 10:</b>	Total approved budget and outturns for Abim district in UGX billions	35

**LIST OF TABLES**

<b>Table 1:</b>	Yield differences that were observed when crops failed to receive sufficient moisture during the critical stage of growth	8
<b>Table 2:</b>	Effect of damages and losses (US\$ million) that were associated with unexpected rainfall patterns on the Ugandan economy, 2010	8
<b>Table 3:</b>	Level of WfAP interventions in EAC partner states	9
<b>Table 4:</b>	Comparisons of the DSIP WfAP budget requirements within the MTEF ceilings, 2010/11-2014-15	18
<b>Table 5:</b>	SSIP for WfAP budget requirements 2009/10 – 2014/15, UGX Million	19
<b>Table 6:</b>	EAC partner states' budget allocation for investment in WfAP	25
<b>Table 7:</b>	Major crops that were cultivated in Otuke district, 2010-2013	26
<b>Table 10:</b>	Selected socio-economic characteristics of the sample community in Abim district	29
<b>Table 11:</b>	Total approved budget, outturns and proportion of agricultural allocations for Otuke district between 2010/11 and 213/14	34

## EXECUTIVE SUMMARY

Uganda's government has prioritized enhancing agricultural production and productivity as a primary intervention in developing the economy. The advantages of enhancing agricultural production and productivity include improving food security at the household level, increasing income for farmers, reducing food prices for both farmers and non-farmers, and the potential of this reduction for spurring economic growth. Increased productivity is also viewed as a panacea to the challenge of increased pressure on the land, demand for more food and need for employment creation resulting from the high population growth rate. Investment in water for agriculture production (WfAP) infrastructure has been recommended as the best-bet intervention that will break the constraints facing Uganda's agriculture. The provision and adoption of WfAP will have multiple effects on the agriculture sector by reducing risk associated with agricultural production and thereby enhancing the adoption of higher-yielding technologies.

The provision of WfAP is associated with a number of benefits, including i) increased yields; ii) enhanced agronomic potential by permitting the growth of crops that would not have been grown under a rainfed environment; iii) increased opportunities for farmers to indulge in yearlong agricultural production; iv) enhanced income because farmers can select crops that are not produced by a large numbers of other farmers; v) increased opportunities to access reliable markets because farmers are assured of consistence in production; vi) enhanced returns to production inputs (labor, capital and land); vii) enhanced food

security; viii) reduced poverty; ix) increased opportunities for employment; x) increased opportunities for facilitative business, including input provision and produce marketing; xi) enhanced natural resource management through the adoption of agro-forestry; and xii) increased income resulting in economic development.

In this study, we attempt to understand how smallholder farmers will achieve greater food security through more-sustainable access to and the productive use of water. Avenues to achieve the desired access to and the productive use of water are hypothesized to include i) a greater political attention to water for smallholder production as evidenced through changes in policies and plans and the effective implementation of these policies and plans at the local, national and regional levels; ii) the increased investment in smarter, affordable and innovative solutions for providing water for smallholder production, especially for women farmers; iii) the increased voice and influence of smallholders, particularly women, within the institutions that are responsible for access to and control of WfAP; iv) ability of smallholder farms to feed the nation, ensure food security and create jobs for the majority of the youth; and v) highly productive and profitable smallholder farms.

The primary objective of this report is to review the trends in public investment in WfAP at the national and subnational levels. Specifically, this report aims to i) review the national and sub-national literature on investment in WfAP with specific reference to investments in water for smallholder agriculture; ii) review the extent to which budget preparation and development

processes enable the consideration of the wider social-economic and growth impacts of investing in WfAP; iii) identify, map and quantify resources that are allocated for WfAP in the national budget; and iv) track and assess the extent to which the appropriated budget translates into allocations and transfers to local governments for the implementation of WfAP for the benefit of smallholder farmers.

### **Methodology**

Key components of the study implementation included a review of relevant literature on investment in WfAP in Uganda; consultative meetings with experts who were selected based on their functions along the WfAP value chain; and the analysis of the national and local government budget towards WfAP and an understanding of investment and operational mechanisms for WfAP at the local government level. The research methods that were adopted for the study included a review of the policy and institutional framework governing WfAP, an analysis of the local government budgets and financing mechanisms for WfAP, semi-structured interviews with key informants in the technical and political arms of the government, and discussions with beneficiary communities. The Otuke and Abim districts were selected for the case studies on WfAP implementation and operations in the local government. Otuke district was sampled due to ongoing efforts by government and civil society organizations, especially CARE Uganda, in promoting the adoption of water-harvesting technologies as well as those that are associated with soil and water conservation. Abim district was selected given the high public investment in WfAP, including by the MoWE and Karamoja Livelihood Program (KALIP). These districts

were sampled due to the high vulnerability and risk that is experienced by the farming communities as a result of droughts, floods and persistent high temperature.

At the community level, investments were tracked up to the point where water for production activities/projects is implemented. Two communities were purposely selected in each district for a focus group discussion (FGD) to shed more light on WfAP facility operation. The main factor that influenced the selection of the communities is their involvement in WfAP activities at the local level. Based on the targeted communities, the participants included villages' opinion leaders, farmer group members and local government officers that were involved in agricultural and WfAP development. The focus groups were held with communities at Koya Parish (42 participants) and local leaders at Kulo-Awach (20 participants) in Abim district. In Otuke district, FGD sessions were held with the Par Pilngim Farmer Group members (15 members) and Bediwoyo Youth Group members (16 participants). In each of the selected FGD sessions, beneficiaries were consulted to gather information on their levels of engagement and their experience using WfAP facilities.

### **Major findings**

Uganda experiences frequent episodes of droughts that culminate in high losses of agricultural outputs. For example, in the last five decades, normal rainfall was only recorded in 58, 66, 47 and 42 percent of the years in the Western, Central, Eastern and Northern regions, respectively. Even in the years that were considered to receive normal rainfall, mild droughts were reported leading to farmers failing to achieve the expected

crop yields. Failure to achieve the expected yields denies farmers the opportunity to improve their welfare. Furthermore, the loss of yield comes with greater costs that are associated with low returns to input, including labor, capital and management. For example, on average, households estimated that approximately 18, 22, 23, 16, 17 and 24 percent of banana, maize, beans, cassava, sweet potato and coffee, respectively, of the expected respective yields were lost due to drought in 2005. Losses as high as 38 and 36 percent of the expected yields for beans and maize were reported in the Northern region. The reported losses only account for the proportion that the farmers are able to estimate. Farmers' comparison of output loss is based on their best achieved production, which is always less than optimal. In this case, the actual potential for agricultural production is unknown as farmers have adopted cropping patterns, technologies and management practices that suit climatic factors as represented by agro-ecological zones. The prevailing cropping pattern is more focused on ensuring that crops survive without due consideration of the growth stage when a crop requires sufficient water for optimal yields. Experimental results show a decrease in the yield of approximately 600 percent if a crop is provided with sufficient water to survive but is deprived extra water that it requires for flowering and seeding.

In some cases, gross domestic product (GDP) growth is severely affected by drought, with repercussions in both the productive and facilitative sectors of the economy. Losses and damages worth 2.8 trillion Ugandan Shillings, which translates to eight percent of the GDP, were reported in 2010 due to a shift in the rainfall seasons. Agriculture and its associated sub-sectors, including

crops, livestock and agro-industry, were the most affected by the poor rains of 2010 and accounted for 87 percent of the experienced loss. Despite the high losses that occur due to the frequent occurrence of incidences of drought, this country is endowed with many water resources that are estimated at 64,282 m<sup>3</sup> per annum per person. Out of the total available water resources, only a small proportion, estimated at 1.5 percent, is utilized annually. Except for some districts around Mt. Elgon and the Central and Southern parts of the country, most parts of Uganda have sufficient water resources that could be harnessed for production.

Uganda's flat terrain and well-distributed water resources permit the development of simple and low-cost WfAP facilities. Despite the advantages that the country holds in the ease of undertaking WfAP development, all of the indicators that are used to measure investment in WfAP rank Uganda the poorest among the East Africa Community members. The indicators for measuring investment in WfAP in which Uganda scores poorly include the ratio of cultivated area under irrigation, annual increase in irrigation, water withdrawal per inhabitant, ratio of renewable water use to potential water use and area under full or partial controlled irrigation.

The government has developed the policy and institutional framework that are necessary for WfAP. Policy documents for facilitating WfAP include the Water Statute (1995), National Water Policy (1999), Water Regulation (1998), and Draft Irrigation Policy (2005). Both the Vision 2040 and National Development Plan recognize investment in WfAP as one of the key focus areas that can facilitate the country's transformation.

Various ministries that are concerned with water utilization and agriculture have put in place strategies by which they have outlined the budget and activities that are necessary for the development of WfAP. In 2009, MoWE developed the WfAP Strategy and Investment Plan to provide a framework to guide, among others, WfAP investments for a period of 25 years. The Agriculture Sector Development Strategic and Investment Plan-DSIP was a planning framework for MAAIF during the period from 2010/11 – 2014/15 and identified WfAP as one of the eight investment areas that are aimed at increasing agriculture productivity. An analysis of the drivers of policy and investment shift for investment in WfAP indicates commitments to international agreements, episodes of droughts and deliberate efforts to prioritize plans and budgets as the major factors influencing WfAP investments.

Both the total allocation budget and the outturns for WfAP between the 2006/07 and 2012/13 financial years show increasing commitments by the government to WfAP. Funds that were allocated to WfAP increased by 2.5 times from UGX4.6 billion to UGX10.7 billion in 2012/13. The WfAP public expenditure has been increasing steadily at an annual rate of approximately 100 percent. Similar to allocation, outturns experienced a steady expansion from 2006/7 to 2012/13. Also observed over the same study duration is the increasing contribution to WfAP by both the development partners and the government. Despite the increasing budget allocations for WfAP, this allocation falls short of meeting the amount that is budgeted by both MAAIF and MoWE. Consistently, there is a large budget deficit ranging from 61 percent in 2010/11 to 80 percent in 2013/14.

Overall, the budget allocations to agriculture among the EAC members remain below the CAADP target of 10 percent, with the exception of Rwanda. The share of the national budget that is allocated to irrigation is higher in Uganda than for other EAC members. In Uganda, the WfAP budget allocations and outturn are expended within the ministries of MAAIF, MoWE and OPM. The local government in the Otuke and Abim districts did not allocate any funds to WfAP. The failure by LoGs to allocate funds to WfAP was associated with a low financial base and the existence of other urgent priorities. Initiatives in WfAP were observed to be at the infant stage at the district level. Efforts by the civil societies, MoWE and OPM were toward the promotion of techniques for WfAP among smallholders. Because these techniques are new and have yet to be fully adopted and implemented, it was difficult to evaluate them. Farmers harnessed opportunities that were available for WfAP through the adoption of lowland rice farming in flood plains and the use of shallow wells.

Opportunities for WfAP in Uganda include i) a consensus among stakeholders on the need for investment in WfAP; ii) the existence of both policy and institutional frameworks that are necessary to facilitate WfAP; iii) opportunities that are presented by WfAP to enhance agricultural production and to spur economic growth; iv) the availability of water resources that could be harnessed for WfAP; v) the high demand for agricultural produce in Uganda and in the surrounding region; vi) investment in WfAP to provide opportunities for the industrial transformation of Uganda's economy; and vii) opportunities for the country to mitigate the impacts of climate change. On the



other hand, challenges that are associated with WfAP investment in Uganda include i) poor and deteriorating social cohesion (social capital) threatening the operation and maintenance of WfAP facilities; ii) the requirement of high investment in human resource-capacity building; iii) the requirement of high investment in WfAP facility design, construction and compensation of utilized land; iv) lack of research and technological knowledge of irrigation; v) influx of counterfeits and low-quality WfAP equipment (available intervention has failed to address the entire value chain in WfAP); vi) poor working relationship between the MoWE and the MAAIF; and vii) the country's ambitious plan for environmental management, especially of wetlands and the river's flooding zones.

### **Key Recommendations**

Strategies for enhancing public and private investment in WfAP include i) revealing the agricultural output losses that are experienced by farmers due to drought; ii) harnessing a good working relationship between the MAAIF, the MoWE and other stakeholders in the planning, designing and construction of WfAP facilities and the building capacity for farmers to sustainably operate and maintain the facilities; iii) clearly defining what constitutes WfAP investment to avoid the clashes that continue to occur between the MoWE and the MAAIF; iv) strengthening the existing institutional framework to advocate for, promote, develop, regulate, supervise, maintain and research WfAP; v) building the capacity of local governments for investment in small infrastructure for WfAP; vi) OPM responding to its Constitutional mandate of coordinating and implementing government policies across ministries, departments and public

institutions as far as investment on WfAP is concerned; vii) developing a comprehensive plan for WfAP that incorporates all of the important components that are necessary for the successful establishment of sustainable WfAP facilities; and viii) addressing the promotion of WfAP among households to increase the effective demand and adoption of cost-effective and efficient facilities.

A public-private partnership approach is proposed to enhance access to sustainable WfAP for smallholders. The government should be involved in the construction of medium-sized water-harvesting facilities (e.g., valley dams) and should invite private actors to lift and pump the water to smallholders at a fee. Investors should be encouraged to purchase simple water-lifting equipment that is available in the market and provide farmers with services of lifting and pumping water to the farms. Uganda's water bodies and their valleys are shallow and therefore permit the lifting and pumping of water using simple modern technologies. There is need for a mechanism to check the influx of counterfeits and low-quality WfAP equipment, especially under the UNBS and Consumer Protection Frameworks.

## 1. INTRODUCTION

### 1.1 Background

The development of the agricultural sector remains critical in addressing Uganda's economic transformation (GoU 2010, 2012). Agriculture remains a source of employment for 66 percent of the working population and provides livelihood to approximately 85 percent of the population (UBoS 2013). Notwithstanding its importance, the sector's growth averaged approximately 1.5 percent per annum (between 2002/3 and 2012/13 period), well below the population growth rate of 3.2 percent. Despite the large proportion of the population that is employed in agriculture, its contribution to the GDP decreased from 56 percent in 1986 to 22 percent in 2012 (UBoS 2013). The sector's contribution to export earning has dwindled from 83 percent in 1998 to 56 in 2012. Although the declining contribution of agriculture to the economy may be an indicator of positive transformation, the substantial resources (labor, land and capital) that are used in agricultural production provide a testimony of a stagnating sector. The proportion of the population that is food-insecure has increased from 59 percent in 1999/2000 to 66 percent in 2005/6 (UBoS 2007). The country's daily average calorie intake has remained lower than the recommended intake of 2,300 calories (MAAIF 2010). The severity of food insecurity and the low intake of calories have been associated with famine arising from drought (Ssewanyana and Kasirye 2010).

Among the government's priorities are enhancing agricultural production and productivity and promoting smallholder agriculture (GoU 2010). These activities

have an immediate effect on addressing poverty and hunger among household members and the country at large (MoFPED 2013). Increased production will lead to increased income for farmers and reduced food prices for both the farmers and non-farmers and is expected to positively impact other productive and facilitating economic sectors (OPM 2013). Increased productivity is viewed as a panacea to challenges of increased pressure on the land, the demand for more food and the need for employment creation (GoU 2010) resulting from the high population growth rate (UBoS 2012). Investment in water for agricultural production (WfAP) infrastructure (ACBF 2012; CAADP 2003) and increased use of biotechnology and financing (ACBF 2012) have been prioritized as the intervention that will break the constraints facing African agriculture. The prioritization of the provision of WfAP will have multiple effects on the sector, such as reducing the risk that is associated with agricultural production, thereby enhancing the adoption of higher-yielding technologies.

To guide future investment in agriculture, Uganda has been classified into 14 agro-ecological zones (see Appendix 1) based on the crop enterprise (farming systems) and expected performance subject to water moisture availability (Wortman and Eledu 1999). Even with this classification, the agro-ecological zones still limit the cropping patterns and intensity (NEMA 2009). The classification of agro-ecological zones was influenced by the mean total rainfall that has been received over a couple of years. Due to lack of sufficient meteorological data, information on rainfall reliability, which could indicate how dependable the rainfall is in various locations, was not



incorporated into the agro-ecological zones of Uganda (Jaetzold and Schmidt 2010). Shifts from normality are always observed across seasons and years, especially in the amount of rainfall that is received (Mwaura and Okoboi 2014). The adoption of WfAP across different agro-ecological zones would overcome the constraints that are related to unreliable rainfall patterns for the production of recommended crops and would permit the husbandry of other non-traditional high-value crops.

The provision of WfAP is associated with a number of benefits to agricultural households and the country at large (FAO 2000). Farmers practicing irrigation achieve higher yields than do those relying on rainfed agriculture (Hagos, *et al.* 2009). Irrigation enhances the agronomic potential by permitting the growth of crops that would not have been grown under a rainfed environment (Jaetzold and Schmidt 2010) and allows farmers to indulge in yearlong agricultural production (FAO 2005). Harnessing water for agricultural production is associated with enhanced income as a farmer could select crops that are not produced by large numbers of other farmers (Mugerwa, *et al.* 2014) and with opportunities for accessing reliable markets as farmers are able to assure consistency in production (ACBF 2012). Other benefits that are associated with irrigation include enhanced returns to production inputs (labor, capital and land); enhanced food security; reduced poverty; increased opportunities for employment; increased income resulting in economic development; increased opportunities for facilitative business, including input provision and produce marketing; and enhanced natural resource management through the adoption of agro-forestry (FAO

2010).

Quantitatively, irrigation increased smallholder income by 220 percent and increased its contribution to agriculture and GDP by 3 and 0.5 percent, respectively, within the duration of three years in Ethiopia (Hagos, *et al.* 2009). The high contribution to the agricultural sector and the country is achieved with irrigation accounting for five percent of the cultivated land. The yields of specific crops have increased for both men and women farmers with irrigation. Among women, maize yields increased by 350 percent, whereas those of Irish potato and tomatoes increased by 50 percent when irrigation was adopted among smallholders in Malawi (Concern Universal 2012). The gross margins for wheat, barley, maize and lentil increased by 91, 37, 93 and 231 percent, respectively, with irrigation compared to those of a rainfed production system among smallholders in Ethiopia (Hagos, *et al.* 2009). The intention of this study is to understand how smallholder farmers will achieve greater food security through more-sustainable access to and the productive use of water. Avenues to achieve the desired access to and the productive use of water are hypothesized to include i) greater political attention to water for smallholder production as evidenced through changes in policies and plans and the effective implementation of these policies and plans at the local, national and regional levels; ii) increased investment in smarter, affordable and innovative solutions to provide water for smallholder production, especially for women farmers; iii) increased voice and influence of smallholders, particularly women, within the institutions that are responsible for access to and control of water for agriculture; iv) ability of smallholder

farms to feed the nation (ensuring food security) and create jobs for the majority of the youth; and v) highly productive and profitable small-holder farms.

## **1.2 Objectives of this study**

The primary objective of this study is to review the trends in public investment in WfAP at the national and subnational levels. This assessment is designed to investigate the level of the government's commitment to enhancing agriculture productivity by enabling the access of smallholder farmers to water. This study also attempts to examine the risks and opportunities when investing in WfAP from the perspective of the government, private sector, and farmers. Specifically, this study sought to

- (i) Review the national and sub-national literature on investment in WfAP with specific reference to investments in water for smallholder agriculture;
- (ii) Review the extent to which budget preparation and development processes enable the consideration of the wider social-economic and growth impacts of investing in WfAP;
- (iii) Identify, map and quantify the resources that have been allocated for WfAP in the national budget; and
- (iv) Track and assess the extent to which the appropriated budget translates into allocations and transfers to local governments for the implementation of WfAP for the benefit of smallholder farmers.

## **1.3 Study Approach**

The implementation of this study involved four key components. The first component was a review of the relevant literature on investment in WfAP in Uganda. This

component involved a review of the policy and institutional frameworks governing the sub-sector and an understanding of the drivers of policy shifts in the past decade and of the influential actors in the planning, budgeting and implementation of WfAP activities along the governance chain. This process also included the identification of the Ministries, Departments and Agencies (MDAs) within the public sector that were directly involved in the budgeting and implementation of WfAP activities. A critical step during this process was to identify the structure, roles and responsibilities of various MDAs in the budgeting and budget-execution processes.

The second component involved mapping the relevant actors along the expenditure and investment chain. Through consultation with experts, an exhaustive list of relevant actors was developed, from which a structured sample was drawn for interviews during the study. Appendix 2 shows the list of experts that were consulted during this study. A clear understanding of the actors aided the development of the relevant research tools that were used in the process, which was followed by individual consultations with the selected actors, both at the national and local government (LoG) levels. The team engaged with technocrats in the Ministry of Water and Environment (MoWE), the Ministry of Agriculture Animal Industry and Fisheries (MAAIF), the Office of the Prime Minister (OPM), and officials at the LoG level. Discussions were also held with development partners and with actors in the private sector.

The third component involved an analysis of the national and local government budget toward WfAP for the period from 2006/7 to

2012/13 both by source (government and development partners) and type (recurrent and development). The analysis aimed to establish trends and patterns in public-resource allocation for WfAP in relation to the total national budget, the budget for agriculture and the WfAP budget to act as a baseline for comparison with future studies after interventions. Comparisons were made between the budgeted funds and the actual outturns and were intended to determine the government level of commitment to the implementation of relevant projects. A separate analysis was performed for institutions in which investments are evident, before the trends were described holistically.

The last component of this study was an understanding of investment and operational mechanisms for WfAP at the local government level. This subnational analysis was implemented through case studies. Case studies were undertaken in the two semi-arid districts of Otuke and Abim. These districts were sampled due to that high vulnerability and risk that are experienced by the farming communities as a result of droughts, floods and persistent high temperature. Otuke district was sampled due to the ongoing efforts of civil society organizations, especially CARE Uganda, in promoting the adoption of water-harvesting technologies as well as those that are associated with soil and water conservation. The MoWE has undertaken the rehabilitation of the Akwera valley dam in the district. Abim district was selected given its high public investment in WfAP, including by the MoWE, in the Kawomeri and Kulodwong dams. The information of the status and investment on WfAP by the MoWE was derived from the Ministry's annual policy statements (MoWE

2012; MoWE 2013) and stakeholders' consultations. Abim district also falls under the area of coverage of Karamoja Livelihood Program (KALIP) under the Office of Prime Minister, which has components of WfAP.

The methodology used a combination of qualitative and quantitative methods and included a review of the policy and institutional framework governing WfAP, an analysis of the local government budgets and financing mechanisms for WfAP, semi-structured interviews with key informants in the technical and political arms of government, and discussions with beneficiary communities. At the community level, investments were tracked up to the point where water for production activities/projects was implemented. Two communities were purposely selected in each district for a focus group discussion (FGD) to shed additional light on WfAP facility operation. The main factor that influenced the selection of the communities was their involvement in WfAP activities at the local level. Based on the targeted communities, the participants included villages' opinion leaders, farmer group members and local government officers that were involved in agricultural and WfAP development. The focus groups were held with communities at Koya Parish (42 participants) and local leaders at Kulo-Awach (20 participants) in Abim district. In Otuke district, FGD sessions were held with Par Pilngim Farmer Group members (15 members) and Bediwoyo Youth Group members (16 members). In each of the selected FGD sessions, beneficiaries were consulted to capture information regarding their levels of engagement and the benefits that was obtained from the WfAP activities, among other issues. Individual WfAP champion farmers were

also visited and queried on their experience and achievements.

To guide the collection of information from various sampled stakeholders, checklists of key questions were developed. Appendix 3 shows the checklists of the key questions that were used to guide consultations during the study.

The rest of the report is structured as follows: Section 2 provides insight into the importance of WfAP for smallholder production; Section 3 presents institutional and policy framework for WfAP budgeting; Section 4 presents an analysis of the budgets for WfAP; Section 5 reviews the budget performance for WfAP under public spending; Section 6 provides insight into the WfAP district-level initiatives, budgeting and implementation; Section 7 reviews the opportunities and challenges that are associated with WfAP; and Section 8 presents strategies for developing WfAP infrastructure for smallholder farmers.

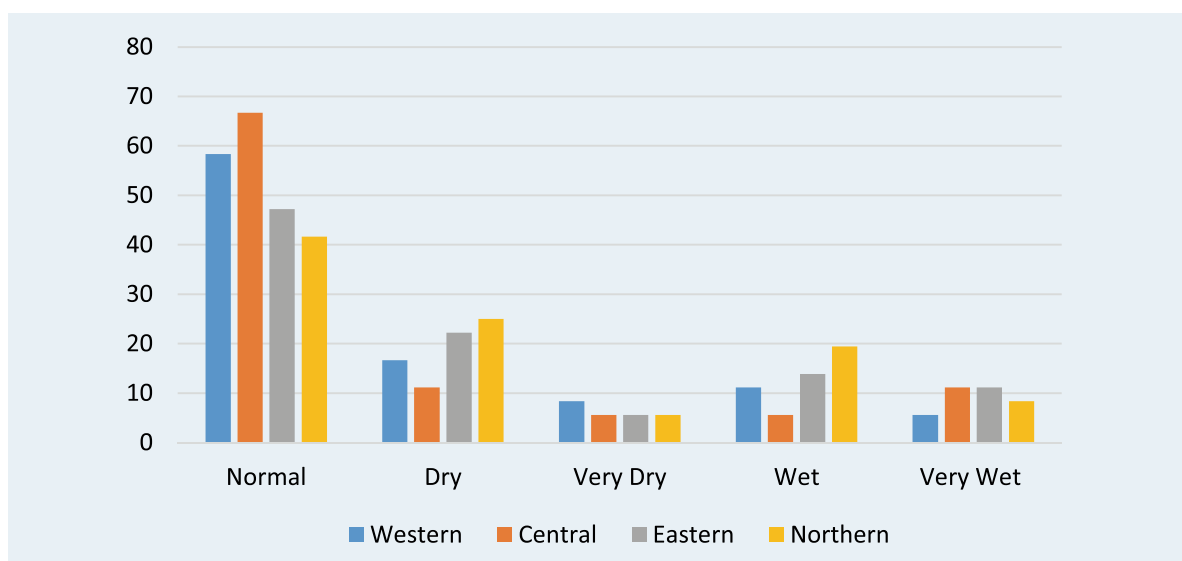
## **2. WATER FOR SMALLHOLDER PRODUCTION IN UGANDA**

This section presents a brief overview of WfAP in the promotion of smallholder production in Uganda. First, this section discusses the rationale for WfAP intervention through a critical review of the existing literature. Second, this section provides insight into the level of WfAP infrastructural investment in Uganda and how this investment compares to that of its partners states in the East African Community (EAC).

### **2.1 Rationale for intervention in WfAP**

Incidences of extreme drought and devastating famine impacting the entire country have been reported almost in every decade since 1910 (GoU 2007). Incidences of national-wide droughts were recorded from 1911-1920, 1931-1940, 1951-1960, 1971-1980, 1981-1990 and 1991-2000. During these drought incidences, the amount of rainfall that was received reduced drastically, leading to widespread crop failure and livestock losses. The incidences of normal rainfall have a regional dimension as illustrated in Figure 1. Incidences of normal reported rainfall were higher in the Central region at 66 percent and lower in the Northern region at 42 percent. Episodes of extreme drought were reported in approximately five percent of the years in all of the regions over a period of five decades. The occurrence of droughts predates the arrival of the Europeans to Uganda in the nineteenth century (Hartwig 1979). Instances of extreme droughts have always resulted in disastrous economic outcomes with tragic social impacts, such as people starving to death, especially in the Karamoja region (Biellik and Henderson 1981).

Uganda's agriculture is strongly influenced by the amount of rainfall that is received. Using the national average rainfall data for aggregated meteorological stations, Mwaura and Okoboi (2014) were able to relate agricultural production and productivity and received rainfall for the last three decades. These authors illustrate seven-year durations of above-average rainfall, normal rainfall and below-average rainfall that corresponded to different levels of agricultural production and productivity in Uganda. Uganda experienced episodes

**Figure 1: Incidences of rainfall conditions from 1943 – 1999, %**

Source: GoU 2007

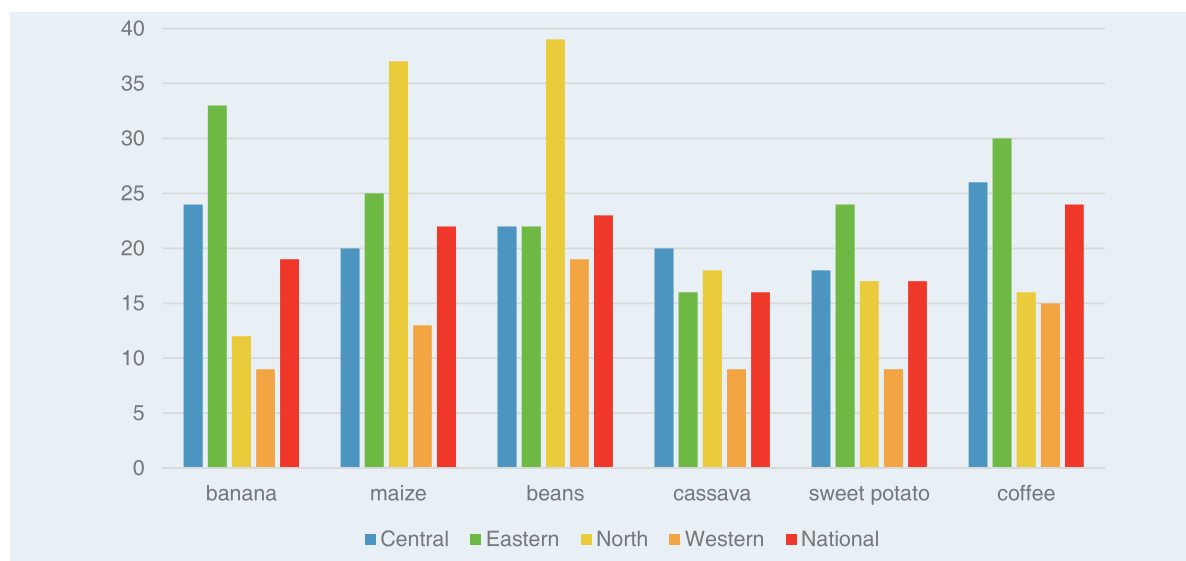
of extreme drought that coincided with the events of the Wolf-Gleisberg Cycle in 1901-1904 and 2010-2011. These cycles occur globally and are associated with high temperatures, drought and heat waves. There is evidence that these changes contributed to the observed high food prices both globally and locally. According to United Nation's Food and Agriculture Organization (FAO Food Index), August 2011 recorded the highest global prices index in the previous 20 years of food price data. On the local scene, the rising global food prices and low agricultural production were the major cause of inflation and the major economic crises that affected Uganda during the same period.

Food headline inflation increased by 11 percent between April and July 2011 (UBoS 2011) affecting welfare, trade and exchange rates. Furthermore, a preliminary analysis based on the Uganda National Household Survey (UNHS) of 2005/6 reveals high level of crop losses associated with drought during the first season of 2005 as illustrated in Figure 2.

The use of irrigation could have mitigated the high losses that were experienced by farmers. Crop losses are experienced after farmers have invested in the inputs that are required for crop production, such as seeds, labor, management, fertilizer and land allocations. These losses occurred irrespective of whether farmers followed the recommendations for suitable crops in various agro-ecological regions (Wortman and Eledu 1999). A decrease in crop production that is reported by farmers only accounts for loss that the farmers are able to estimate based on their best achieved production. Farmers are unable to estimate the total loss that is experienced by crops due to the complex biological nature of the yield response to soil moisture at different stages of plant growth. Moreover, practices of establishing optimum yield at the farm level in relation to various inputs, such as moisture, fertilizer, etc., have not been adopted in Uganda.

Sufficient soil moisture is required for crops to achieve optimal potential yields. Although soil moisture is required at every

**Figure 2: Share of selected crop losses at the household level due to drought in 2005, %**



Source: Author's calculations were based on UNHS 2005/6

stage of crop growth, one of the most critical durations for fulfilling a crop's water demand for optimal yields is senescence. In the senescence stage, crops are involved in rigorous biological process of developing flowers and filling in the seeds (grains) or tubers. The cropping pattern in Uganda is such that annual crops are planted with the on-set of long and/or short rains. Uganda's cropping pattern demonstrates crop production cycles that are more oriented to crop germination rather than including the crop senescence stage. Under such a crop production cycle in which some important stages of production cannot be assured, sufficient moisture opportunities of increased yields are wasted. Table 1 shows the grain and biomass yield of a crop that was sufficiently provided with water and those of another that was denied sufficient water only during senescence (76-87 days). Although the numbers of leaves are the same in both treatments, the biomass and yields were significantly different. Grain and biomass differences of 557 and 231 percent, respectively, were recorded between the maize crop that was stressed during

senescence and that which had sufficient water during this period.

A study by the Office of the Prime Minister (2013) provides an insight into how Uganda economy was devastated due to failure to adopt supplemental WfAP. Although the amount of rainfall that was received was slightly above the long-term average in Mbarara and Gulu, its unexpected timing led to drought, culminating in a distortion of the economy in 2010. Indeed, OPM estimates a loss and damage value of UGX 2.8 trillion (US\$1.2), equivalent to 7.5 percent of the country's GDP in 2010. Table 2 shows the damages and losses that were experienced by unexpected rainfall in 2010. Agriculture and its associated sub-sectors, including crops, livestock and agro-industry, were the most affected by the erratic rains of 2010 and accounted for 87 percent of the experienced loss. The reported damages to livestock of US\$44.6 million were a result of livestock death. Most of these losses would have been minimized with sufficient intervention of the WfAP.



**Table 1: Yield differences that were observed when crops failed to receive sufficient moisture during the critical stage of growth**

	Sufficient moisture	Water stressed during senescence <sup>1</sup>	Differences in %
Grain yield (kg/ha)	11,416	1,738	557
Biomass yield (kg/ha)	22,797	6,873	231
Biomass before senescence (kg/ha)	376	376	0
Number of leaves per stem	20	20	0
LAI before senescence	1	1	0
LAI at senescence	4	2	101
Crop maturity period (days)	127	127	0

Notes: 1 Senescence period is between 76-87 days of crop growth for maize  
Example borrowed from experimental results from the USA due to the unavailability of irrigation data in Uganda.

Source: DSSA Model for cultivar McCurdy 84a

Despite the risk that is presented by the frequent occurrence of incidences of drought, the country is endowed with many water resources, which are estimated at 64,282 m<sup>3</sup> per annum per capita (MoWE, 2008). Of the total available water resources, only a small fraction that is estimated at 1.5 percent is utilized annually. Figure 3 shows the water status among various districts based on the amount available to the population annually. Most of the country could be considered not water stressed.

Except for some districts around Mt. Elgon and the Central and Southern parts of the country, most parts of Uganda have sufficient water resources that could be harnessed for production. Water resources in districts that are considered water-stressed could be enhanced by connecting these resources to major water bodies in areas of excess, by adopting water-harvesting during rain seasons and by storing water for use during the dry season.

**Table 2: Effect of damages and losses (US\$ million) that were associated with unexpected rainfall patterns on the Ugandan economy, 2010**

Sector	Damages	Losses	Total	% share Loss
Crops		434.3	434.3	37
Livestock	44.6	428.2	472.8	40
Agro-industry		116.7	116.7	10
Commerce		71.3	71.3	6
Electricity		44.6	44.6	4
Water		0.8	0.8	0
Health		6.3	6.3	1
Education		20.4	20.4	2
Food Aid		7.1	7.1	1
Total		1,129.50	1,174.10	

Source: OPM (2013)





The relative poor performance of Uganda relative to that of its EAC partner states is not surprising – historically, people still believe in rainfed agriculture, which calls for the sensitization for people to shift from this mindset to one that encourages alternative water sources.

### **3. POLICY AND INSTITUTIONAL FRAMEWORKS FOR WFAP**

This section presents a critical review of the current policy and institutional frameworks for promoting WfAP in Uganda. These frameworks are pertinent to understanding the policy thrust, key actors and their level of influence, and implementation mechanisms and challenges. The policy frameworks are discussed prior to the institutional frameworks. The last sub-section discusses the drivers of policy shift on WfAP.

#### **3.1 Policy framework**

Government efforts regarding investment in WfAP have been broadly anchored in a number of policy instruments. Critical to WfAP development are the National Water Statute and the National Water Policy. These instruments derive their mandate from the Ugandan Constitution (1995), which stresses the importance of resource management for sustainable development. The Water Statute (1995) provides the institutional framework and legislation that are for the management of water resources, water supply and sanitation. Among the objectives of the statute are the orderly development and use of water resources for animals, irrigation, industrial, commercial and mining uses, energy, navigation, fisheries, preservation of flora and fauna and recreation in ways

that minimize the harmful effects to the environment.

The National Water Policy 1999 (MoWE 1999) promotes proper water resource assessment and planning for agricultural production. This policy calls for increasing the capacity of the farmers to access and use water for crop, fishery and livestock production. This policy also promotes appropriate water-harvesting technologies for irrigation and livestock development and calls for an enabling the environment for farmers and the private sector to participate in the financing, planning, development and management of WfAP. This policy follows both the Water Statute of 1995 and the Water Regulation of 1998, which set and define the responsibility of different entities in water resource development. These instruments vest the responsibility of controlling, protecting and managing water resources to the Ministries that are concerned with water and natural resources. These two documents permit the extraction of water for domestic use, including for watering at least 30 livestock (approximately 43 mature cows) units, subsistence fish production and subsistence irrigation (not exceeding 0.5 ha) or the extraction of a volume of water not exceeding 400 m<sup>3</sup> in a period of 24 hours without a requirement of an application for a license.

One of the key components of WfAP, especially for smallholder farmers is the development of an efficient and cost-effective irrigation infrastructure. Although irrigation is mentioned in a number of policy documents, there is no commitment regarding how irrigation could be scaled-up through funding and investment, possibly because there is no specific policy to guide

such investments. Although attempts have been made to this end, the irrigation policy has been in draft form since 2005 (MoWE 2005). This draft policy recognizes the role of farmers managing small-scale schemes and proposes an institutional framework for implementing irrigation activities in the country. The absence of a policy constrains efforts to design mechanisms for speedy farmer access to irrigation technologies and hinders the efforts of stakeholders to increase funding for WfAP investment.

The NDP recognizes investment in WfAP as one of the key focus areas that can facilitate the country's transformation (GoU, 2011). The NDP identifies low levels of adoption of water-harvesting techniques, the lack of a guiding framework for irrigation, and the high cost of investment in irrigation infrastructure as some of the key constraints affecting the WfAP.

In 2009, the MoWE developed the WfAP Strategy and Investment Plan to provide a framework to guide WfAP investments for a period of 25 years (MoWE 2009). This plan sets target for investment in WfAP to be achieved by 2035. In line with these targets, the national irrigation Master plan (MoWE 2011) proposes an investment framework that is set over the immediate, short, medium and long terms. The Master plan provides relevant actions and investment costs for implementing each and every proposed action as well as the actors that are involved in the implementation. This plan targets a 6.3 percent increase in irrigation from the baseline of 2.7 percent over a 25-year period. Although the WfAP Strategy and Investment Plan acknowledges the challenge of coordinating the planning of an infrastructure (MoWE) and its link to

production activities (MAAIF), this plan fails to provide a solution. This plan however assumes the formulation of clearer policy and strategic guidance on WfAP that considers the role and interest of the MAAIF. The Agriculture Sector Development Strategic and Investment Plan-DSIP (MAAIF 2010), a planning framework for the MAAIF for the period from 2010/11 – 2014/15, identifies WfAP as one of the eight investment areas that are aimed at increasing agriculture productivity. This plan sets out a government plan to promote small-scale irrigation practices as well as sustainable land management approaches, such as soil and water conservation, conservation agriculture and agro-forestry, etc. This plan scales irrigation at two levels: at the household level with strategies aiming to promote water-harvesting and small-scale irrigation and government-promoted, large-scale irrigation projects that are aimed at targeting specific crops.

The policy framework is supportive of WfAP investments/interventions for smallholders, who account for most of the farmers in Uganda. The WfAP investment that is prioritized in the development plans targets enhancing smallholder farmers' capacity to adopt and use micro-dams. Furthermore, the construction of medium- and large-scale dams benefits the smallholders who have been allocated land in the existing irrigation schemes. The major challenge with increasing the access of WfAP for smallholders is the low level of adoption of technology, the high costs that are associated with infrastructural development and problems in designing sustainable farmer-governed WfAP systems. Moreover, even where water storage facilities have been provided, the cost of establishing canals or laying pipes to

the farms is never computed in the design of dams. This challenge is aggravated by the working relationship between the MAAIF and the MoWE. Although the MoWE has had the capacity and mandate of planning and constructing WfAP facilities, the MAAIF function of ensuring the productive use of water by smallholders is not well linked to the former.

### **3.2 Institutional frameworks**

This section maps out the key stakeholders/actors in the WfAP sub-sector. At the heart of the public investment and implementation of issues that are related to WfAP is a set of institutions that are responsible for the implementation of the actions of the policies and programs. This section reviews these institutional arrangements and the extent to which they are configured to ensure effective investment.

The design and implementation of the activities that are related to WfAP take place at the national level, local government level and community level. At the national level, the overall responsibility for WfAP is vested in the MoWE, although there is a shared responsibility with the MAAIF. Overall policy guidance to the water subsector is provided by the Water Policy Committee (WPC), a principal advisory comprising members across relevant sectors. Technical guidance to the sector is provided by the Water and Environment Sector Working Group (WESWG) (MoWE 2008; WWAP 2005). Among other responsibilities, the WESWG recommends budgets and work plans for approval by the government and assesses the performance of the sector. The MAAIF is among the members of WESWG to provide policy input on issues that are related to WfAP (MoWE 2009).

The MoWE is charged with the development, regulation and overall management of Uganda's WfAP (MoWE 2011). However, the ministry largely plays off-farm functions, such as assessing the availability of water resources, designing and constructing off-farm infrastructure and supporting the operation and maintenance of off-farm infrastructure. WfAP activities are implemented by the Department of Water for Production under the Directorate of Water Development (DWD). The department is, in part, charged with contributing to policy on WfAP, planning and budgeting for WfAP, monitoring the implementation of WfAP facilities at the district level, and setting standards for the construction of WfAP facilities. However, the department does not have the capacity to address all of the issues that are related to WfAP and the needs for agriculture production.

The responsibility for on-farm investments is vested in the MAAIF (MoWE 2009). These activities include, in part, planning and budgeting for on-farm irrigation systems (such as tertiary canals and drainage channels), technical assistance in the design and construction of on-farm irrigation systems, promotion of appropriate irrigation technologies, support of the operation and maintenance of the on-farm systems, and extension services and advice to farmers regarding efficient irrigation approaches. These activities are being hampered by the vestment of the responsibility of WfAP in the MoWE. There is need to harmonize the roles of the MoWE and MAAIF with respect to WfAP.

The LoG and lower administrative levels are expected to participate in the planning and monitoring of projects, the identification and

provision of land for facilities, and, last but not least, the building capacity of farmers and water-user committees. At the sub-county level, some of the activities include planning and budgeting for WfAP projects; identifying sites, forming and the capacity for building WfAP water user groups, and monitoring WfAP activities.

At the community level are the Water User Communities/farmers. Their participation is in the form of providing land, materials and labor for WfAP facilities; forming water-user associations; managing and maintaining facilities; and operating and maintaining the on-farm works. The committees are established to manage the community-owned WfAP facilities, are elected by the beneficiary communities, and are charged with planning, operating and maintaining of the facilities. These committees are tasked to establish a fund for maintaining the water sources. One of the key challenges that these committees face is limited commitment by the communities to operationalize the fund. The lack of facilitation for the committee members also reduces the incentive to participate effectively.

Civil society organizations (CSOs) are also instrumental in the provision of WfAP. These organizations work closely with ministries, LoG and communities to assess local needs, implement projects in partnership with the government, and fund the establishment of facilities. The involvement of CSOs is largely in the promotion of small-scale WfAP activities. Some of the CSOs that are involved in WfAP include CARE International-Uganda, Appropriate Technology, Caritas World Vision, Water Governance Institute, ICCO-Uganda Rite Aid, and Welthungerhilfe, among others.

Although the private sector is recognized as pivotal in promoting investment in WfAP, it is largely inactive in the promotion of smallholder farming. One exception is Balton, Ltd., which has been involved in marketing and designing drip irrigation systems and irrigation pit tanks' polythene lining. Balton has also collaborated with Centenary Bank in designing a loan facility for farmers who are interested in WfAP investment. The private sector participation is, to some extent evident, in large-scale agriculture enterprises. The few cases of WfAP among large investors include flower farming for exports around Kampala and in Ntungamo; sugarcane by Kakira Sugar Mills; and Tilda at Kibimba Rice Scheme.

Approximately 4 percent of households invested in irrigation (UNPS 2009), most of them in the Eastern Region (Budaka, Namutumba and Palissa districts). Irrigation schemes (e.g., Mubuku, Doho, Olweny and Agoro) have been allocated to smallholder farmers, totaling to 5330 registered farming families. There are also other livestock-watering infrastructures, mostly in the cattle corridor districts and the Karamoja region. In some cases, farmers mitigating drought impacts have fetched water and poured it onto the crops using buckets. The use of inverted plastic bottles with water at the roots of the crops is gaining popularity, especially after the promotion by a church-based development group, Caritas in Mityana Diocese. The National Adaptation Plan of Action (NAPA) project of the Climate Change Unit has WfAP intervention for smallholders in Nakasongola and Mubende districts.

### **3.3 Understanding the drivers of policy shifts in WfAP**

The National Water Policy (1999) was the first government document to clearly stipulate the strategies for WfAP. This policy document on water was prepared in response to Uganda WAP, which adopted and highlighted guiding principles for water resources as stipulated by the Dublin-Rio de Janeiro process. The Dublin-Rio de Janeiro processes, which are global conferences on sustainable development, were convened by the United Nations Conference on Environment and Development (UNCED). The processes gave birth to a number of international instruments, including Agenda 21. Agenda 21 offers a practical approach to applying suitable development policies at the local and national levels (UNDESA 2012).

Uganda is party to Agenda 21, whose chapter 18 is concerned with freshwater resource management for sustainable development. Uganda is a signatory to a number of other global conventions that are relevant for WfAP apart from the United Nations Community. Uganda's commitment to the Comprehensive Africa Agriculture Development Program (CAADP) stimulated the development of strategies to actualize WfAP proposals. CAADP was launched by the African Union (AU) and New Partnership for Africa's Development (NEPAD) in 2003 in an effort to accelerate agricultural growth in the region. CAADP seeks to improve Africa's food security, poverty reduction and sustainable use of natural resources. In the Maputo Declaration of 2003, the Heads of State committed themselves to this goal by agreeing to allocate at least 10 percent of the national budget to agriculture with the aim of achieving at least a 6 percent annual rate of

growth in the sector. CAADP has five pillars, all of which could be implemented through the adoption of WfAP. Three months after the Maputo declaration, a meeting was held in Rome to discuss the implementation of the CAADP. The Rome meeting brought together African Agriculture Ministers, donors, civil society and the FAO. This meeting aimed to review the national long-term food security and agricultural development strategies, the development of the National Medium-Term Investment Programs (NMTIPs) and the Bankable Investment Project Profiles (BIPPs). By the end of 2004, the FAO had produced NMTIPs and BIPPs in response to a request by Uganda for assistance. NMTIPs were developed through a review of key strategy/policy documents, including the Poverty Eradication Action Plan (PEAP<sup>1</sup>), the Plan for the Modernization of Agriculture (PMA) and the Food Security and National Agricultural Development, among others. Through NMTIPs, the government aimed at improving food security and poverty reduction. The BIPPs that were recommended by the FAO included the development of smallholder irrigation and water harvesting.

A flurry of activities focusing on WfAP followed. These activities included the financing of a Farm Income Enhancement and Forestry Conservation (FIEFOC) Project; the development of a National Irrigation Master Plan 2010-2035 (NIMP); a revision of the WfAP Strategy and Investment Plan; the drafting of the Irrigation Policy; and commitments and allocations of money for WfAP projects by both development partners and the government. The FIEFOC Project took an integrated approach to improve livelihood and income growth with activities that included water catchment management, the rehabilitation of formal



agriculture schemes and increasing the area under irrigation in Uganda by 3,000 ha. In its design, the FIEFOC implemented the BIPPS that were recommended to Uganda by the FAO (NEPAD-FAO 2004). The formal agricultural schemes that were being rehabilitated under FIEFOC were initiated or constructed in the 1940s in a drive to respond to the food crisis that followed World War II.

Similar to the 2000s, the 1940s experienced a flurry of irrigation activities across the country, starting with the establishment of the Doho irrigation in 1942 and the feasibility study of Mubuku in 1949 (Carruthers 1970). The results of the activities of the 1940s led to the development of 21 irrigation projects and to the determination of the potential area for irrigation. More smaller and medium-size WfAP projects were constructed throughout the country – e.g., 19 facilities in the case of Otuke district. Except for the Akwera dam that has been recently rehabilitated, another 18 dams have been neglected for many years, resulting in them breaking down and silting.

The prioritization of interventions in WfAP by institutions is a major driver on the levels of achieved investments. Although the Northern Uganda Agriculture Livelihoods Recovery Program (ALREP) and the Karamoja Livelihoods Program (KALIP) are sister programs under the Peace Recovery and Development Plan (PRDP) and are funded by the same agency, their differences in conceptualization regarding the need for WfAP has resulted in varying achievements. KALIP themes include WfAP, whereas its productive infrastructure component focuses mostly on water resources development. Although both KALIP and

ALREP address the same challenges and focus on regions with almost similar climatic challenges, the former has had substantial achievements in WfAP investment. KALIP provides an example of a comprehensive approach on WfAP with wide-ranging issues on agro-climatic factors, hydrology, water resource management technologies, economic potential of WfAP and proposed activities of the program (KALIP 2009). The DSIP together with its operationalization strategy (MAAIF 2012) led to the financing opportunity by the World Bank on Agricultural Cluster Development (ACD) of the water for agricultural production (WfAP) as a component of the ACD.

Although a number of drivers, including commitments to international agreements, support by development partners, and episodes of shocks threatening food security, influence policy and infrastructural development as related to WfAP, interventions are always stipulated within the existing development frameworks. In this case, interventions are considered strategies to respond to current development paradigms.

## 4. BUDGETING FOR WFAP

### 4.1 Institutional framework and policy guidelines governing the budgeting and implementation of WfAP

#### 4.1.1 Legal framework

Institutional framework and policy guidelines governing the budgeting and implementation of WfAP are best appreciated in a holistic manner. The budget process is guided by a legal framework. The Public Finance and Accountability Act (PFAA) of 2003<sup>2</sup> provides the international best practices in the public sectors of budgeting and financial management. This law clearly states that budget planning and implementation are the responsibility of the Ministry of Finance, Planning and Economic Development (MoFPED) and the Accountant General, respectively. Furthermore, the fiscal relationship between the central government and the LoG is guided by the Local Government Act of 1997 and the Fiscal Decentralization Strategy (FDS) of 2002. The budget Act of 2001 clearly stipulates the budget procedure.

The budgeting process is a bottom-up process, meaning that each level of authority fits its budget within the mother authority. According to the MoFPED, the budget process is a year-round affair that begins with the review and update of the Medium Term Expenditure Framework (MTEF) and a portfolio performance review by July and August each year<sup>3</sup>. This review is followed by the first budget consultative workshop, which takes place between October and November. Then, all of the Sector Working Groups (SWG) and LoGs begin the preparation of Budget Framework

Papers (BFP), which is followed up by Sector BFP ministerial consultations that lead to the preparation of the draft national BFP. The BFP requires approval by the cabinet before it is presented to the stakeholders in a national budget workshop that is also known as the Public Expenditure Review meeting.

The final BFP is presented to Parliament by the 1<sup>st</sup> April of each year and is then followed by the development of the Background to the Budget and the detailed development of budget estimates by each ministry and institution. Consultations with the Parliamentary Budget Committee by the MoFPED allows the estimates of revenue and expenditure to be correctly compiled, which triggers preparations of the budget speech that is scheduled for presentation to parliament on the 15<sup>th</sup> day of June each year. This is the ideal process as depicted in Appendix 3; however, this process is not always followed due to delays in submissions by various ministries, LoGs and institutions.

#### 4.1.2 Policy guidelines

Budget formulation and implementation for WfAP are guided by a number of policy instruments. The budget process is guided by the MTEF and NDP.

The NDP specifies the priority areas of government investment in which WfAP is considered a complementary intervention for economic transformation (GoU 2010). The objective of intervening in WfAP in the NDP is to utilize Uganda's water resources for development and guarantee her water security and sustainable utilization. This intervention aims at maximizing benefits for the present and future generations while supporting the sustainable exploitation of

water resources for economic activities, such as crop cultivation, livestock farming, the generation of electricity, industrial processing and wildlife conservation (GoU 2010). Some of the development strategies of the NDP for WfAP include developing public irrigation schemes; promoting micro-level irrigation; promoting appropriate technology for household-level irrigation; constructing of valley dams and valley tanks; and managing water resources at the catchment level.

The MTEF provides a far-reaching and realistic medium-term resource framework by the government. This instrument is used to allocate public financial resources in priority areas to achieve government development goals and provides five-year budget ceilings for the sector and for some of the agencies and sub-sectors within it. The current MTEF runs from 2010/11-2014/15. The MTEF covers the duration of the first NDP and DSIP and most of the SSIP. MTEF also permits active and robust rounds of prioritization each year as part of the

preparation of the annual BFP. WfAP is one of the priority areas in the MTEF.

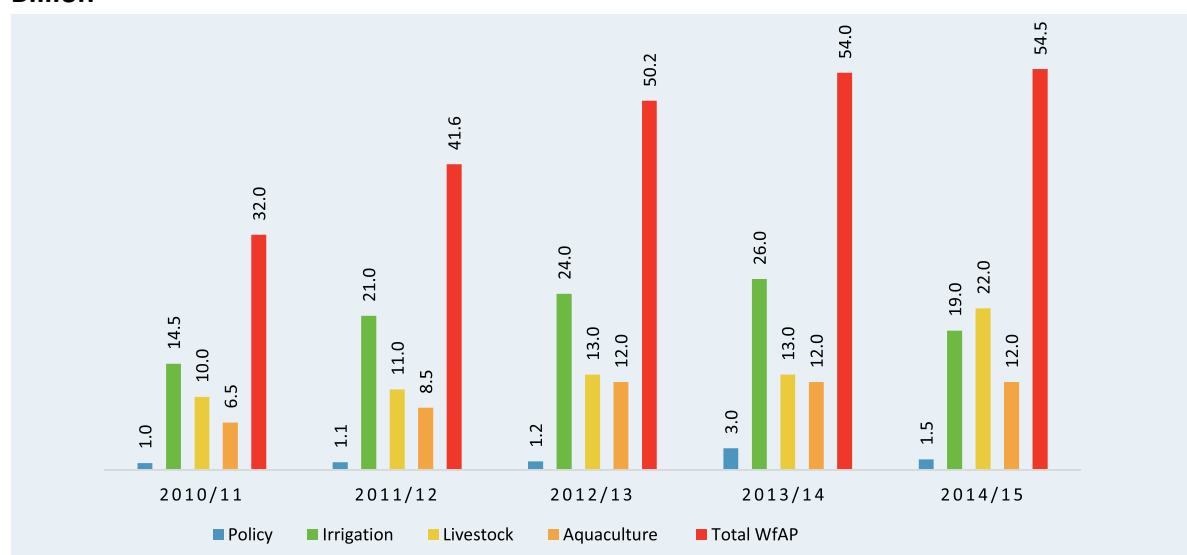
#### 4.1.3 Sector budget process

The guiding instrument in budget formulation at the sector or ministry level is the Sector Investment Plan (SIP). Each ministry, which mostly represents a particular sector, has its own investment plan. The ministries that are concerned with investment in WfAP include the MAAIF and MoWE. SIPs are planning frameworks that set the activity and investment priorities to streamline the sectors' operation to efficiently and effectively deliver their mandates for the country. SIPs provide prioritization framework within each sector to remain within the budget limits and focus on strategic goals (UNCCD 2008).

#### Agricultural Sector Investment Plan

The Agriculture Sector Development Strategy and Investment Plan (DSIP) 2010/11-2014/15 is the current SIP for the agriculture sector. This plan was produced in 2010 by the MAAIF through

**Figure 4: DSIP five-year proposed budget for water for agricultural development, UGX Billion**



Source: MAAIF 2010



consultations of the sector’s stakeholders, including academia, development partners, concerned government ministries and agencies, farmers and other value-chain investors. The DSIP was developed through a review of the preceding sector plans; an analysis of the sectors’ existing opportunities and challenges; and the country’s aspiration for agricultural development. This plan targets four key areas of interventions, including increasing agricultural production and productivity; increasing access to markets and value additions; creating an enabling environment for the private sector in agriculture; and strengthening agricultural institutions in the central and local governments.

Each of the proposed interventions area is considered as a program with specific objectives, also referred to as sub-programs. The eight sub-programs under program 1 on “Enhancing Production and Productivity” include the increased use of WfAP and the enhanced productivity of land through the sustainable management of soil and water resources. This plan aims at developing water resources for agriculture based on sustainable irrigation water for livestock and aquaculture. The DSIP proposes to address policy and planning frameworks that may

hinder the achievement of the desired results. The plan also highlights specific activities to be undertaken under every sub-program and the budgetary requirements. Specifically, the estimated five-year budget for WfAP is UGX232.2 billion (USD116.1 million), which is nearly 8.5 percent of the total DSIP budget (UGX2,731). It is evident from Figure 4 that the WfAP budget was expected to increase from UGX32 billion in 2010/11 to UGX54.5 billion in 2014/15, equivalent to a 70.3-percent increase. Nearly 45 percent of the proposed budget is for irrigation, and approximately 3.4 percent is earmarked for policy-related activities. Notwithstanding the small share toward policy and institutional frameworks, this result is a positive indicator of MAAIF’s desire to create an enabling environment for the successful implementation of the WfAP components.

Next, it is important to relate the DSIP budget proposal to the overall MTEF framework as illustrated in Table 4. Under the current MTEF ceilings, the WfAP will be underfunded to the tune of 75 percent of the DSIP budget requirements. In other words, the DSIP WfAP was allocated to a quarter of the planned budget, which is a significant funding requirement gap. Table 4 further

**Table 4: Comparisons of the DSIP WfAP budget requirements within the MTEF ceilings, 2010/11-2014-15**

	2010/11	2011/12	2012/13	2013/14	2014/15	Total
DSIP budget for WfAP	32.0	41.6	50.2	54.0	54.5	232.3
MTEF (UGX billion)						
- MAAIF	342.0	376.0	414.0	455.5	501.0	2088.5
- WfAP	9.5	10.5	11.5	12.6	13.9	58.0
MTEF (%)						
-WfAP to the DSIP budget	29.7	25.2	22.9	23.3	25.5	25.0
- WfAP to MAAIF	2.8	2.8	2.8	2.8	2.8	2.8
Funding deficit for WfAP, %	70.3	74.8	77.1	76.7	74.5	75.0

Source: Authors calculations based on MAAIF (2010) and MoFPED (2013).

reveals that the WfAP has allocated 2.8 percent of the MAAIF MTEF ceiling, which is well below the 8.5 percent as articulated in the DSIP.

#### Strategic Sector Investment Plan for the Water and Sanitation Sector

The Strategic Sector Investment Plan for the Water and Sanitation Sector (SSIP) in Uganda of 2009 is the MoWE's SIP. The SSIP was developed through a process of situational analysis and scenario building. SSIP acknowledges the challenges of WfAP are associated with the lack of coordinated planning and a link between water facilities and production; the user-based operation and maintenance system; inadequate funding and increasing unit costs; and the low sustainability of installed infrastructure. The SSIP calculation of investment requirements is based on the Strategic Sector Investment Model (SSIM), which provides estimates of the investment needs according to sector targets. The SSIM

is linked to a GIS for visualizing and aiding decision-making on investment priorities. Unlike the DSIP, the SSIP has set budget proposals for various interventions from 2009 to 2035. SSIM is structured to provide detailed estimates per sub-sector between 2009 and 2015 (see Table 5), and for the years thereafter, the estimates are based on a 2-percent annual increase for the recurrent activities that are related to increases in water use and activities in the water sector. Table 5 also shows the MTEF approvals and funding deficit for WfAP based on the SSIP budgetary requirement. The irrigation potential is classified into two categories based on the investment requirement for agricultural water utilization. Irrigation potential A is where agricultural water could be utilized on land without the need for storage, whereas with irrigation potential B, investment in storage facilities and a feeder system is required prior to agricultural water utilization.

**Table 5: SSIP for WfAP budget requirements 2009/10 – 2014/15, UGX Million**

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Total
Irrigation potential A	1,121	6,986	13,675	21,407	23,422	25,354	91,965
Irrigation potential B	1,140	3,167	6,335	9,502	12,670	11,403	44,217
<b>Livestock:</b>							
- Rehabilitation	2,711	5,636	8,974	12,766	16,758	17,558	64,403
- New facilities	8,336	13,337	21,673	25,008	20,006	20,006	108,366
Irrigation & livestock total <sup>a</sup>	13,308	29,126	50,657	68,683	72,856	74,321	308,951
Total WfAP requirement <sup>b</sup>	28,822	51,054	80,927	107,922	116,691	119,886	814,253
MTEF Approved budget	22,736	22,780	21,990	21,714	20,050	34,999	144,269
% Irrigation	17.0	34.9	39.5	45.0	49.5	49.5	44.1
Funding deficit	21.2	55.4	72.9	79.9	82.9	70.9	63.9

NB: <sup>a</sup> total irrigation and livestock as summed from district budgets, <sup>b</sup> total country WfAP budget needs

Source: MoWE 2009

The SSIP goal in WfAP sub-sector intervention is cited as “WfAP services provided for increased production to reduce poverty on a sustainable basis”. Specifically, the WfAP targets crops, livestock, aquaculture and rural industries (MoWE 2010). The SSIP also address the issues of institutional coordination and capacity development. The SSIP acknowledges the interventions and implementation constraints that are presented by the MTEF budget ceiling; the cash flow situation within the MoFPED; the procurement procedures; and the accountability of the released resources.

**Agricultural Sector Working Group:** WfAP issues are also deliberated under the Agricultural Sector Working Group (ASWG). The ASWG is a key coordinating institution for issues related to agriculture and is composed of the MAAIF, other relevant ministries and agencies, the private sector, farmer organizations, civil society organizations and development partners. The ASWG is responsible for the budget process after receiving guidelines from the MoFPED. These guidelines include MTEF budget ceilings, among others. This forum

is also involved in budget monitoring and assessment, sector policy deliberations and providing information for Joint Government-Donor reviews.

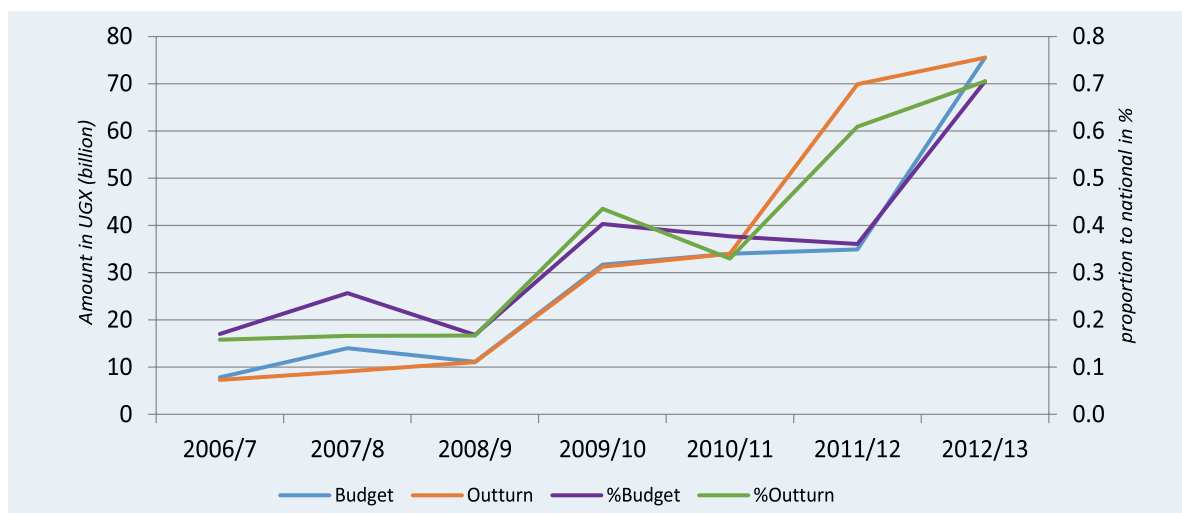
## 5. BUDGET PERFORMANCE FOR WFAP/WFAP UNDER PUBLIC SPENDING

In this section, we present a budget analysis of the public spending related to WfAP between 2006/07 and 2012/13. The data on government-approved budgets and out-turns for ministries that are concerned with WfAP were used in the analysis.

### 5.1 Budget allocations and out-turns

Figure 5 shows the total budget and out-turns for WfAP in UGX billion between the 2006/07 and 2012/13 financial years and the proportions of budget allocations and out-turns to the national budgets. Funds that were allocated to WfAP increased from UGX 8 billion in 2006/07 to UGX 75 billion in 2012/13. The WfAP public expenditure has increased steadily at an annual rate of

**Figure 5: Budget allocation vs out-turns 2006/7-2012/13**



Source: MoFPED 2006-2011.

approximately one hundred percent. Similar to allocation, the out-turns experienced a steady expansion from 2006/7 to 2012/13. The differences/gap between allocations and out-turns decreased from 2006/7 to 2009/10 when the allocation surpassed the out-turns. Though the trend shows that allocated funds are being used, it would be important to assess the value for WfAP money through a critical auditing of the spending later than 2009/10, when the actual expenditure was higher than the approved budget.

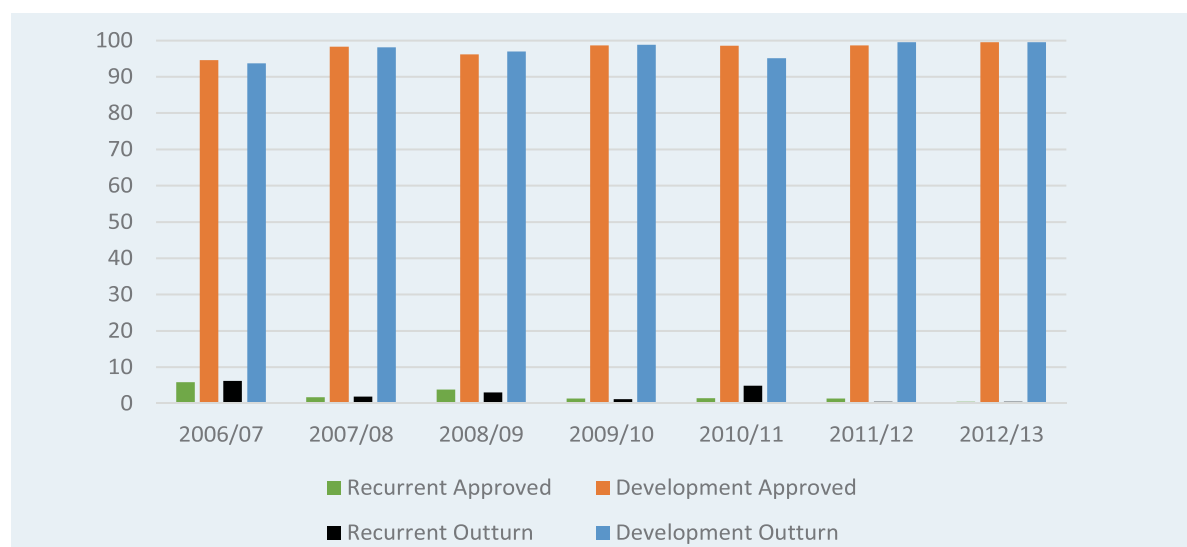
Perhaps the reason for such trends is that some projects, particularly those geared towards rice growing, were short lived, which called for new projects. The possibility of a development partner supporting new WfAP facilities that were not initially budget also exists. Discrepancies in expenditures can be best explained by a delay in budget allocation releases by the central government and development partners.

Whereas the real budget allocations and out-turns are low considering the

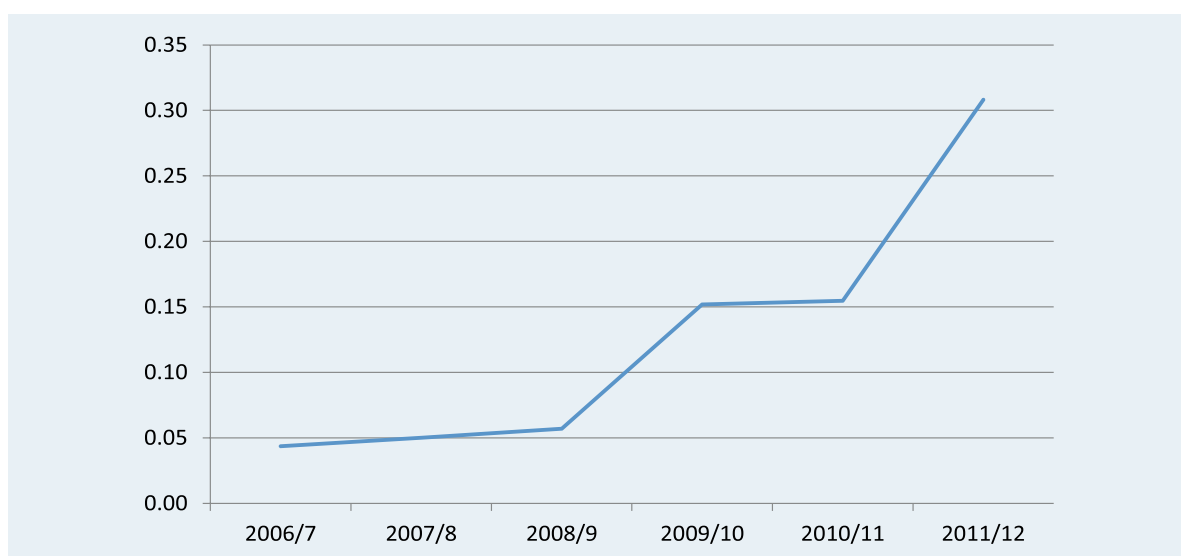
high investment cost that is required to construct WfAP facilities, a comparison of the estimates of allocation and expenditure to the national budget depicts a different picture. Though less than one percent of the budget may appear small, WfAP is a sub-component of agricultural production, and, considering other sub-components and components of budget, its proportion is modest. However, the real investment is quite low, considering the size of the national budget. Furthermore, the allocations need to consider the low adoption of WfAP technologies among farmers, making public expenditure a major investment.

Analyses of the allocations to the WfAP under MoWE show that high proportions of the budget were approved and that out-turns were developmental. Figure 6 presents a comparison of the proportion of recurrence and development for both approved and out-turned budgets between 2006/7 and 2012/3. Both the approved and out-turned budgets for recurrent expenditure were less than four percent during the entire period of comparison.

**Figure 6: Percent recurrence vs development of the approved and outturned budgets**



Source: MoFPED 2006-2011.

**Figure 7: WfAP Budget as a % of the GDP**

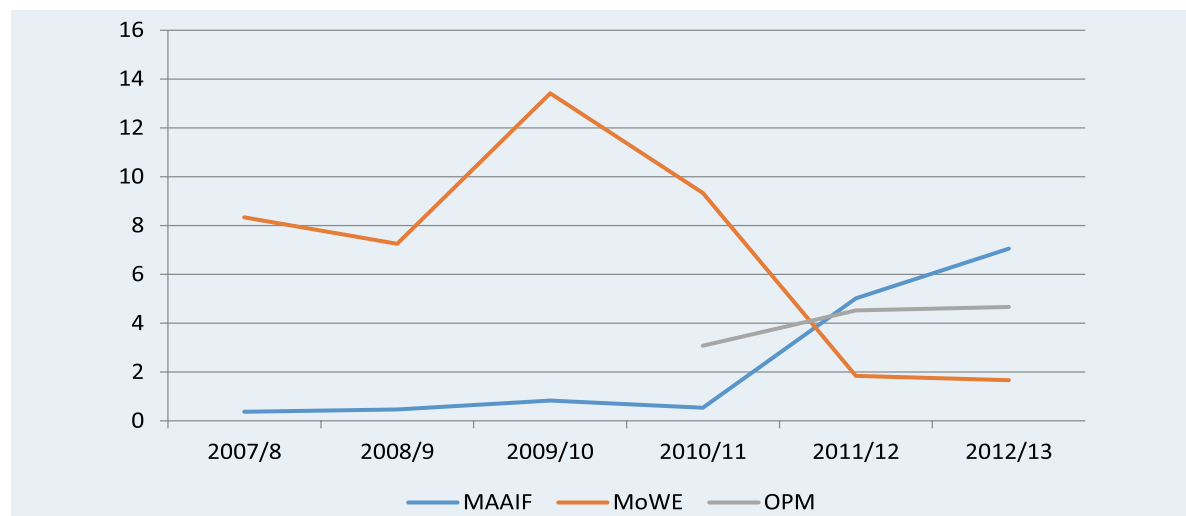
Source: MoFPED 2006-2011.

A comparison of the WfAP expenditure to GDP depicts a worse picture than that of the proportion of the national budget. Figure presents the WfAP expenditure as a proportion of the GDP. In general, the percentage of expenditure of WfAP as a proportion was still low during periods of stagnancy, especially between 2006/7 and 2009/10. Later, from 2008/9 to 2011/12, this proportion increased from 0.05 to 0.3 percent. This trend is positive, and if it were to be maintained or even enhanced, the country would be able to ameliorate the challenges of low sector growth, thereby spurring economic growth.

Figure 8 shows the proportion of the ministries' WfAP budget allocations to the total budgets. The MoWE had the highest percentage of allocation to the WfAP of its total budget before 2011/12. Unexpectedly, the proportion of WfAP allocation to the total MAAIF budget was low (less than one percent) until 2010/11 and only increased to seven percent in 2012/13. Since 2010/11, the proportion of WfAP to the total budget of OPM and MAAIF has increased. The ratio

of WfAP allocation to the total budget of the MoWE began to increase in 2008/09 due to the rehabilitation of large-scale irrigation schemes, such as Doho and Mubuku under the FIEFOC. The MoWE has received the highest budget allocation due to its lobbying power on farm projects and has developed the capacity to handle WfAP facilities through the establishment of a department and the acquisition of prerequisite human resources and machinery/equipment. The proportion of budget allocations of WfAP in the OPM began to increase in 2010/11 because at this time, post-war agricultural livelihood reconstruction programs began to be implemented. MAAIF has enhanced its capacity in handling WfAP issues by improving, among other components, human resources by hiring agricultural mechanical engineers.

**Figure 8: WfAP budget allocations to key ministries in Uganda between 2007/8 and 2012/13**



Source: MoFPED 2006-2012

Broadly speaking, the WfAP sub-sector has received increasing support from both the government and its development partners, as illustrated in Figure 9. However, from 2011/12 to 2012/13, the support from the development partners surpassed that from the government. The most plausible explanations include the following: i) the development partners' realization that opportunities for increasing agricultural production and productivity lie more in WfAP investments relative to other interventions. With the declining per-capita land owned and the failure to adopt high-yielding technologies that are partly associated with the vagaries of weather, the intervention in WfAP appears most promising for ameliorating low agricultural production. ii) The period from 2011/12 to 2012/13 coincides with the spreading awareness on climate change and the need for mitigating the predicted threat to agricultural production. Indeed, the presence of compelling SIPs of the relevant sectors in the area of WfAP investments led to the attraction of the development partners' support. Other explanations include iii) the

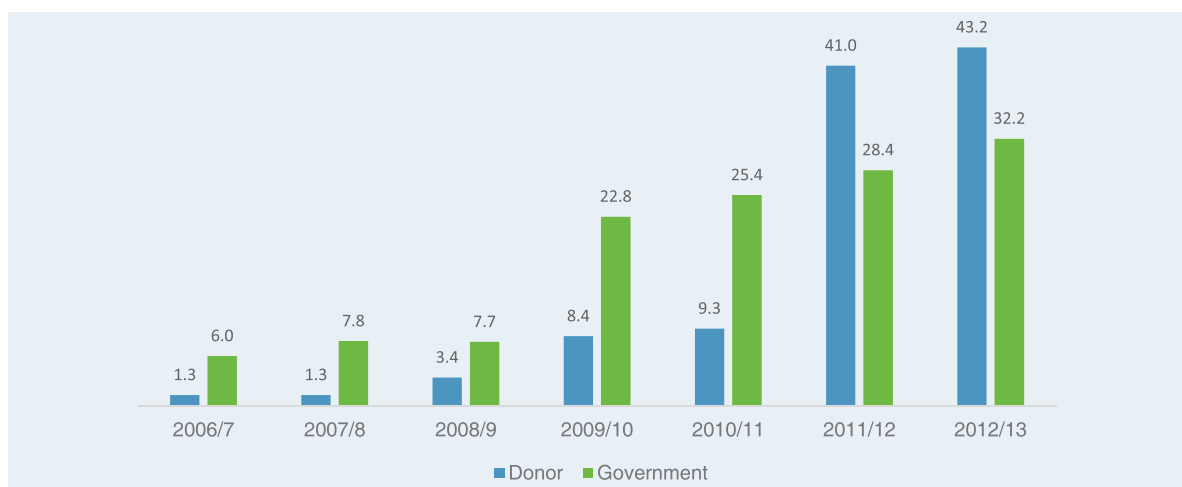
high food prices that have been experienced globally and iv) the recommendation by the FAO regarding the BIPPs having positively influenced WfAP.

Some of the development partners that have dedicated resources to WfAP include the FAO, African Development Bank (AfDB), World Bank, Islamic Bank, French Development Fund (AFD) and Japan International Cooperation (JICA), among others.

## 5.2 Budgeting for Irrigation in the East Africa countries

A comparison of the budget allocations for WfAP among the members of the East Africa Community presents a major challenge due to a number of factors. First, WfAP is an activity or a sub-component within the Sectors' Budget, which ranges from ministries that are associated with water resource development, agriculture, livestock and fisheries, irrigation to general ministries that are associated with regional development, disaster management or the coordination of government operations. Second, the WfAP

**Figure 9: Comparisons of the Government and Development Partners' contribution to WfAP, UGX billions**



Source: MoFPED 2012

investment does not carry the same name across different countries or financing sub-components. Third, to sufficiently address the specific allocations to WfAP, one needs to review specific countries' "Approved Estimate of Revenue and Expenditure" at the central and devolved government levels. Moreover, the Approved Estimate of Revenue and Expenditure is a huge statistical document that is not available on the countries' websites. Finally, reviewing the literature on budgets allocation failed to produce a similar case study that could provide sufficient grounds for comparison. Furthermore, due to the dynamism of budget processes, the best comparison case scenario could have been a 5-year total or mean.

Table 6 presents a comparison of Uganda's budget commitments with those of her partner states in the EAC. The national budget reflects the size of the economy. Overall, the allocation by partner states to agriculture remains below the CAADP target of 10 percent, with the exception of Rwanda. However, the share of the national budget that is allocated to irrigation is higher

in Uganda relative to her partner countries. Considering the frequent episodes of drought that are experienced in the EAC region and the potential of WfAP intervention in mitigating the agricultural losses that are related to drought, the allocations for WfAP seem to be low. The drivers of investment in WfAP are deliberate efforts by governments through their respective ministries. The deliberate planning for WfAP seems to be influenced by incidences of drought and the resultant famine and human suffering. Given that the region has a common general climatic pattern that is influenced by the Indian Ocean Monsoon Wind and the Inter-tropical Convergence Zone, spells of commitment to WfAP occur concurrently across the EAC members (GoU 2008a; GoK 2008b). However, the intensity of the droughts influences the level of commitments and thus the budget allocation and execution of WfAP projects. In the long- and medium-term, there are regional proposals to develop WfAP infrastructure to harness increased agricultural production and productivity in Kenya, Tanzania, Rwanda and Uganda.



**Table 6: EAC partner states' budget allocation for investment in WfAP**

Country	Budget year	Budget (US\$Bn)	Share to:	
			Agriculture	Irrigation
Rwanda	2014/15	2.6	10.0	0.0040
Tanzania	2011/12	8.1	6.8	0.0001
Kenya	2013/14	19.1	4.0	0.0053
Uganda	2011/12	3.9	4.0	0.0500

Source: MoF 2013; MoF 2011; MINECOFIN 2014; MoFPED 2011

## 6. WFAP BUDGETING AND IMPLEMENTATION AT THE LOG LEVEL

This section discusses the investment and operational mechanisms for WfAP at the LoG level through a case study approach. The purposively selected districts included Otuke (curved from greater Lira district in 2010) and Abim (curved from Kotido district in 2006). Specifically, this section tracks and assesses the budget allocations from the central government to each of these districts. The discussion starts with Otuke district prior to that of Abim district.

### 6.1 Otuke district

#### 6.1.1 Socio-economic characteristics

As a new district, it is quite difficult to sufficiently enumerate the socio-economic information and welfare indicators of Otuke because the available data are mixed with those of Lira district (Otuke District Council 2011). The available data indicate that by the time the district was formed, high levels of poverty prevailed, with 80 percent of the population considered to be below the official poverty line. The district is among those that were adversely affected by two decades of the Lord Resistance Army (LRA) insurgency that led to the displacement of the population to the camps. Indeed, the

economic activities were disrupted during the LRA insurgency. At the time of this insurgency, the people of Otuke district were struggling to change their economic activity from livestock to crop production partly because of sporadic raiding by the Karamojong from 1979-1987. Upon the restoration of peace in the region, the formerly internally displaced persons started to return to their communities. The raiding by the Karamojong has since stopped, and the population is settling to both crop husbandry and livestock rearing – with cultivation serving as the major source of livelihood.

#### 6.1.2 Rainfall patterns and climatic and soil conditions

Otuke district, similar to most of the other districts in the Northern Region, exhibit a unimodal rainfall pattern with a single rainfall maximum. The rainy season stretches from March to October with a short dry spell in June. The long dry season stretches from November to February.

The district lies in a transitional climatic zone that shifts from the wetter in Western Langi to the dry Karamoja Region. The prevailing climatic and soil conditions in the district call for WfAP interventions for agriculture to be sufficiently practiced. Furthermore, in some instances, rainfall is insufficient and unreliable during the conventional



rainfall seasons, necessitating supplemental irrigation to protect farmers from risk of crop loss due to drought. Moreover, the poor soil-water retention capacity threatens crop loss due to drought only a few days after rainfall stops. Locals have adopted the cultivation of fast-growing drought-tolerant annual crops (Mwebaze 2014). The production of both traditional and drought-tolerant annual crops could be greatly improved with irrigation.

### 6.1.3 Crop production

The production, acreage and yield of the major crops that are cultivated in the district are presented in Table 7. The yields varied across the years, with a drastic decline in 2012. The rainfall patterns greatly influenced the area that was allocated for crop production and the resultant yields. There was also a noticeable decline in the area under rice cultivation during the same year. The area under rice decreased from

20 percent in 2011 to 6.2 percent in 2012. Notwithstanding this decline, lowland rice is gaining popularity among farmers (ODPD 2013), particularly on hydromorphic soils in swampy areas.

Due to the prevailing weather patterns, agricultural production activities are majorly restricted between April and November, resulting in seasons of unemployment and severe poverty and food shortages that last up to six months (see Table 8). The provision and adoption of irrigation have the potential to improve agricultural production cycles (see Table 8 last column) and therefore yields. Access to water will increase the yields of traditional crops and will lead to the adoption of high-value crops and to a shift to higher-yielding technologies, including improved seeds, fertilizer and other land management practices. Even with the existing fast-growing crops and varieties, opportunities for increasing returns from

**Table 7: Major crops that were cultivated in Otuke district, 2010-2013**

Crop	2010			2011		
	Area (ha)	Production (MT)	Yield	Area (ha)	Production (MT)	Yield
Finger Millet	2,431	756	0.31	2,023	613	0.30
Sorghum	2,585	1,303	0.50	1,524	1,333	0.87
Rice	4,291	9,474	2.21	3,425	8,220	2.40
beans	2,590	932	0.36	2,177	1,306	0.60
Pigeon Pea	4,203	2,289	0.54	3,321	2,391	0.72
G/Nut	2,639	1,964	0.74	2,038	1,957	0.96
Simsim	2,971	1,069	0.36	2,562	1,537	0.60
Crop	2012			2013		
	Area (ha)	Production (MT)	Yield	Area (ha)	Production (MT)	Yield
Finger Millet	1,930	565	0.29	2,315	926	0.40
Sorghum	4,827	1,770	0.37	4,532	2,262	0.50
Rice	1,366	2,765	2.02	1,887	4,341	2.30
beans	3,933	986	0.25	3,107	1,305	0.42
Pigeon Pea	3,232	1,748	0.54	1,952	1,230	0.63
G/Nut	3,063	1,821	0.59	1,742	1,603	0.92
Simsim	3,540	1,355	0.38	-	-	-

Source: Otuke District Production Department (ODPD) 2013.

**Table 8: Current and feasible agricultural production cycle for selected crops in Otuke**

Crop enterprises	Planting	Flowering and Senescence	Harvesting	Production cycle length	Idle period (months)	Feasible production cycles with WfAP
Millet	April	June	July	3 months	9	3
Pigeon pea	April	July	September	5 months	7	2
Rice	July	September	November	4 months	8	3
Bean (black) <sup>1</sup>	June	August	September	3 months	9	3
Sunflower	April	June	July	3 months	9	3
Simsim	July	September	November	4 months	8	2
Cassava <sup>2</sup>	April		November	6 months	6	2

NB: <sup>1</sup> black bean and <sup>2</sup>NAPE 42 cassava were adopted as they are fast-growing and drought-resistant

Source: Author's based on FGD with farmers

agriculture exist through increasing the number of cycles per crop enterprise. For example, rice production will increase from 1 to 3 production cycles in a farming calendar. Irrigation will also ensure increased yields per cycle because the water stress at any crop growth stage will be minimized.

#### 6.1.4 Experiences with WfAP interventions

Although investment in WfAP is a necessity for agricultural transformation in the district, inadequate financial resources only allow the district to address other urgent priorities (*Samuel Ebonge, District Agricultural Officer-DAO*)<sup>4</sup>. According to the DAO, the only window for WfAP within the budgeting framework is the Production and Marketing Allocation for agricultural development. During FY2013/14, the district was allocated UGX 35 million for non-conditional agricultural development, of which UGX 4 million was earmarked for WfAP. The amount for WfAP was allocated to a demonstration farm in a progressive farmer's field in Olilim sub-county.

Initially, the plan was to establish a water-harvesting polythene-lined pit demonstration with water that was transferred with a treadle pump. Due to

the rocky catena at the proposed location for a pit tank, the district's agricultural officials resolved to source water from a shallow well, treadle-pumped to a tank in the farmer's land upon which gravity will be used to transfer the water from the tank to the crops (*Patrick Aluk, the Progressive Farmers Selected for demonstration*)<sup>4</sup>. The water drip facilities for this demonstration were procured and delivered to Otuke at the time of the field visit (*Ebonge, DAO*). However, the tank and treadle pump had not yet been delivered to the farmer at this time.

**Akwera Valley Dam:** The MoWE completed the rehabilitation of the Akwera valley dam at Adwari Parish in 2012, targeting agricultural development. However, the LoG technical departments<sup>5</sup> that were in charge of WfAP were not involved in its planning or implementation. Consequently, the LoG technocrats had limited knowledge of the MoWE's plans for the dam. Instead, Balton<sup>6</sup> (U) Ltd had been contracted to establish a WfAP demonstration field. Fish has also been introduced to the dam. Balton laid complex drip irrigation facilities with water being transferred by gravity from the dam to the holding tanks, from which it was fed to

the crop through drip systems.

Balton selected the Bediwo Youth Group to run the field demonstration. The youth group has a current membership of 56 youths mostly from the parish where the dam is located. The group members are expected to work jointly on the communally owned project for three days every week. The area that is covered by the demonstration project is approximately one hectare, with one portion of land owned by the government and the other portion being community owned. The first demonstration crops, including tomatoes, onion and cabbages, were to be planted in the second quarter of 2014. While the group members are expected to work jointly for three days every week, the initiative has already registered significant member absenteeism, which is likely to impact the project performance and team cohesion if not checked.

**Potential for WfAP facility development:**

Otuke has 19 valley dams that were constructed during the colonial era from the 1940s to the early 1960s (Table 9). These dams have the potential to hold large volumes of water that could be used for agricultural production and only require desiltation and rehabilitation to become functional.

**CSOs interventions:** A number of CSOs have presence in the district. CARE Uganda promotes WfAP development and pilots water-harvesting and soil and water conservation practices with 24 farmers from 26 farmer groups in three sub-counties. Nearly 67 percent of the members are women. CARE WfAP activities are implemented in collaboration with another non-government organization (NGO): WHH.

This project began in January 2014 and involves the identification of progressive farmers who could successfully champion the interventions on WfAP. Each of the selected progressive farmers hosts a demonstration site for other members of respective farmer groups. Overall, approximately 550 members of the farmer groups are scheduled to learn simple techniques of water harvesting and soil and water conservation practices and conservation agriculture practices that ensure the optimal use of available water and moisture in the soil for increased crop productivity.

Farmer groups' members work jointly in selecting the progressive farmer and setting up the demonstration. These individuals provide labor and gather posts for fencing the pit tank. The role of a progressive farmer acting as champion is to mobilize group members to set up the demonstration. In one such tank where FDG was held, it took approximately 88 man-days to excavate a 126-m<sup>3</sup> pit tank. CARE provides farmers with the pit tank lining material and the treadle pump. The site for digging the pit is selected by CARE/WHH staff members who have received training on the same. A pit lining of polythene for 6 demonstration fields had been procured, distributed to farmers and lined in the pit at the time of the study. Another component of the CARE/WHH demonstration is the growing of high-value crops, especially vegetables, including tomatoes, onions, eggplants and capsicum, among others.

In addition to CARE/WHH WfAP initiatives, a church has expressed interest in constructing an irrigation system for its 15 members with water that is sourced from the Akwera valley dam. This construction is occurring

three months after the drip irrigation for the Akwera valley dam is laid.

**Farmers' own initiatives:** The growing of lowland rice in the district demonstrates the willingness of farmers to harness the available opportunity to use WfAP. Despite the lack of alteration or water management operations being undertaken on the farms where rice is grown, the fact that farmers utilize flooded areas for production is a positive step in the right direction. Rice production has expanded the available opportunities of income, employment and food security among the households (Table 7). Farmers are also using the flooding pans to grow other crops.

*One such farmer is Patrick Aluk in Olilim Sub-county, who is being targeted as a champion farmer to host demonstrations by LoG Agricultural Production and CARE. This farmer cultivates approximately one acre on a flooding pan that is next to a shallow well that he uses to fetch water for agriculture. Due to the presence of both the flooding pan and the shallow well, this farmer is able to produce high-value crops throughout the year. The crops that are grown include onions, eggplants, tomatoes and capsicum. During the first quarter of 2014 –which is also part of the dry spell- on*

*land estimated at 850 m<sup>2</sup>, Aluk earned more than UGX600,000 (US\$240) from tomato sales.*

## 6.2 Abim District

### 6.2.1 Socio-economic characteristics

Although Abim district is considered to be in Karamoja, a major population is of the Ethur community (Luo ancestry) largely practicing crop husbandry. Selected socio-economic characteristics of a sampled community in Abim district is presented in Table 10. The Abim and Otuke districts have many similarities, including agro-ecological factors, socio-cultural and socio-economic characteristics, and history. Similar to Otuke, Abim also suffered from the Karamoja raid as well as the LRA insurgency.

### 6.2.2 Rainfall and climatic and soil conditions

The rainfall patterns mirror those of Otuke district, with agricultural production activities being restricted between April and October. Irrigation is considered a major investment that could transform agriculture. The terrain in Abim is suitable for the construction of a large number of WfAP facilities. The hilly terrain provides water catchment areas, and the flat plains below the hills could be harnessed for water collection and storage.

**Table 10: Selected socio-economic characteristics of the sample community in Abim district**

Age group (years)	Proportion of FSG participants	Average Households sizes	Average Cultivated area	Proportion (%) with livestock	Proportion (%) female
>64 years	27	6	5	0	0
55-64	41	8	4	30	30
45-54	9	12	5	0	50
35-44	5	7	2	0	100
< 35 years	18	6	3	0	25
<b>Average</b>		<b>7</b>	<b>4</b>	<b>14</b>	<b>28</b>

Source: Author calculation based on FGD participation, May 2014

### 6.2.3 Experience with WfAP interventions

Abim is on the wetter part of Karamoja towards the Langi and Acholi sub-regions. This region benefits from the KALIP initiative on WfAP by virtue of being in the Karamoja WfAP.

#### ***KALIP's WfAP initiatives in the district include the following:***

- Valley tank in Kolei Parish, Nyakwai Sub-county. Plans are underway by the district to begin fish farming and vegetable growing. A capacity building for irrigation technologies is in the plan.
- The Kulo Awach tank was constructed by GOAL<sup>7</sup> with funding from KALIP and handed over to the communities in March 2014. This tank is not yet in use, and communities have yet to devise modalities of utilizing the tank.
- Valley tank in Kulo-Abim has been rehabilitated by GOAL. The de-siltation of the dam achieved an average depth of 1.3 m. Approximately 50 farmers who formed a group should directly benefit from WfAP. Each farmer has been allocated a piece of land that is estimated at 25 m<sup>2</sup> around the dam. The group's members have begun cultivating high-value crops (cabbages, tomatoes, onions, etc.).
- KALIP is also considering establishing additional valley tanks. Some of the locations being evaluated to benefit from the KALIP initiative include Puno (Lotuke sub-county), Akeler (Nyakwae sub-county), and Akado-Kulo (Abim sub-county)

#### ***MoWE's WfAP initiatives***

a) ***Kawomeri Valley Dam:*** Kawomeri dam is in Koya Parish, Alerek Sub-county. According to the local community, the local elders initiated the process in 1997. The local elders held meeting and resolved on the importance of a dam, having considered the potential benefit of such an investment. These elders forwarded their resolutions to the Sub-county, who later advanced the idea to the District. Later in 2010, the construction of the dam commenced. Although the dam was completed in 2013, it has been unable to accumulate water – raising local concerns over the quality of the construction work. During field consultations with stakeholders, it was evident that the Kawomeri dam was yet to be officially handed over to either the district or the community. Further interrogation of the dam's status among local stakeholders indicates a controversial handover process to the District Water Officer. The MoWE acknowledged that the political commissioning had yet to be performed. However, the technical handover was performed to allow the constructor to leave the site after completing the assignment.

b) ***Kulodwong Valley Dam:*** Kulodwong dam is among the WfAP facilities that were constructed during the colonial era that locals felt should be rehabilitated. The dam was among those that were initially targeted by the government for rehabilitation in late 1990s. Together with the Kailong dam in Kotido district, Kulodwong was contracted out for rehabilitation

in 1999. Before the Kulodwong dam could be completed, the Kailong dams collapsed even before commissioning. The contractors from South Africa failed to complete the rehabilitation of the Kulodwong dam after the Kailong incident. Accordingly, the government resolved to build the local capacity of public and private sectors in designing, constructing and supervising the dams. Kulodwong dam is still on the priority list for rehabilitation by the MoWE (MoWE 2013) and only awaits the availability of funds.

**c) Other MoWE's planned valley dams**

- MoWE is constructing Katabok Dam in Aywelu Parish, but district officials are not fully involved in its construction;
- Some dams that were constructed during the colonial era require rehabilitation, such as Kulodwong in Alerek sub-county, Anaro in Lotukei sub-county, Omagal in Morulem sub-county and Alal in Nyakwae sub-county; and
- New sites for WfAP include Acilokwele in Lotukei Sub-county.

**6.3 District-level institutional framework for WfAP: lessons from Abim and Otuke**

Uganda's decentralization policy recognizes LoGs as pertinent institutions for service delivery. In this regard, LoGs are empowered to integrate their priorities within the national development framework. Ideally, districts have the leeway to plan, mobilize resources and implement activities, including WfAP, up to the community level. The mechanism for planning and service delivery at the district level provides for a bottom-up approach. Villages are expected

to set priorities based on local demands. These priorities are forwarded to the parish, which integrates them into the Parish Development Plan (PDP). At the sub county level, the council deliberates PDPs and prepares the Sub County Development Plan (SDP). In Abim, discussions with the community reveal that the structures were, to some extent, functional, as communities are involved in identifying priorities, some of which were eventually funded. For instance, in 1997, the community in Koya Parish, Alerek Sub County, asked the government to construct a dam to facilitate access to water for animals and domestic use. This request was submitted to the sub county through to the district. While WfAP was not the ultimate purpose of the request, the construction of Kawomeri Dam in 2010 was in part attributed to the bottom-up priority setting.

Upon assessment of the resource envelope, the sub-county identifies priorities that can be funded by local resources, while the remaining priorities are submitted to the district as unfunded priorities for incorporation in the district budget. A record of these priorities at the sub county level is also pertinent for assessment by external partners, such as NGOs, who are interested in investing in development activities at that level.

It is important to note that two relevant strands of institutions exist at the LoG. In the technical arm, the Chief Administrative Officer is responsible for the overall accountability for district activities. The assessment of district priorities and the integration of all sectoral and lower LoG plans are bestowed upon the District Planner. On-farm WfAP activities are directly



a mandate of the Production and Marketing sector. The sector is headed by the District Production Officer (DPO) and includes the Crops, Livestock, Fisheries, Entomology, Trade and Commerce, and NAADS departments. The operations of the sector are directly linked to MAAIF. Planning for the implementation of off-farm activities is executed in the Water and Sanitation sector in consultation with the MoWE. Ideally, the activities that are related to agriculture should be implemented in consultation with the Production and Marketing sector. However, these relationships vary across districts. While working relationships are clear and harmonized in Abim district, inter-ministerial differences between the MAAIF and MoWE have spread to LoG operations in Otuke, with the Production and Marketing sector claiming a limited role in the implementation of WfAP activities that were spearheaded by the Water and Sanitation sector.

In the political arm, the key actors are the chairpersons and councils at the district and sub county levels and the councils. Within the councils, the secretary for production should play a key role in promoting issues of WfAP in liaison with the technical team. These secretaries are tasked to defend budget proposals for production issues for integration into the development plans at each level and the district budget.

At the community level, water user committees are expected to play a front-line role, linking users and political and technical staff. In both districts, while WfAP facilities are in existence, these committees are less active (slowly losing the spirit of voluntarism). It is important to note that all of the institutions interface directly with

non-state actors, especially NGOs, who are involved in the provision of WfAP activities.

#### 6.4 Opportunities for financing WfAP in the districts

Local governments have four avenues of sourcing for funds. These avenues are as follows:

**Locally generated revenue:** - Local governments are mandated to generate revenue from taxes on economic activities being undertaken in communities. Some of the taxes that are levied include operational tax and vehicle tax, among others. Out of the total revenue that is generated locally, 60-65 percent should be disbursed to meet expenditures at the sub-county level. The other proportion of locally generated revenue is retained at the district level to cater to the budgetary needs at this level.

**Unconditional transfers:** The districts receive unconditional transfers from the central government. These types of allocations are not strictly restricted to any particular budget activity; therefore, LoG could prioritize allocation to WfAP. However, evidence shows that the funds usually meet district recurrent expenditure, including staff salaries, administrative activities and equipment. Moreover, 25-30 percent of the transfers are disbursed to sub-counties as a compensation for the loss of graduated tax<sup>8</sup>. All of the sub-counties receive transfers with allocations based on population size, area and poverty level. Land area is given a weight of 0.15, while the rest of the weight is shared equally between the poverty level and population size.

**Development conditional grants:** These grants are transfers with specific activities



and areas of need. The transfer of particular grants must be approved by the district council before budgeting.

**Development partners:** Regularly, development partners identify issues requiring intervention in districts and feel obliged to provide financing. Mostly, the development partners step in to fulfill proposed activities and district strategies. Some development partners/other government agencies provide financing for the district to implement assignments on their behalf, e.g., GIZ and the Uganda AIDS Commission, among others.

Under the current NUSAF program, sub-counties submit their priorities to the district technical planning committee for appraisal. These priorities are sent to the OPM, which uses the above parameters to disburse funds. The districts in this case have an opportunity to integrate WfAP proposals in these budgets.

The PRDP block figure is sent from OPM bases on parameters such as the number of displaced persons, the poverty count, and the number of people who were in camps by 2008. The funds are allocated across departments, but of relevance to this study are the production and marketing departments – where the opportunity finance WfAP falls. However, most resources have in the past been allocated to the LoG department to cater to administration costs. In the past financial years, allocation to the LoG department amounted to approximately 400 million annually, compared with the UGX99 million that is received by the production and marketing departments. The programs that districts are unable to fund using the above options but that are planned

for in the district budget are financed by conditional grants.

Another opportunity for financing WfAP is under the Youth Livelihood Grant (YLG). This grant is managed by the Ministry of Gender, Labor and Social Development (MoGLSD) and follows the same appraisal process as does the NUSAF. The YLG can also identify a project requiring WfAP, but the budget ceiling is often too low to cater to meaningful WfAP activities.

Having flexibility within the above financing mechanism is one thing, while allocating funds for WfAP is another. The prioritization of WfAP activities at these levels will depend on a number of aspects, including the degree to which WfAP is identified as a need by communities; the importance of WfAP in the perspective of the planning and political arm at different levels; and the competing priorities across sectors, such as education, health, water and sanitation.

### **6.5 The trends of public spending at the district level (resource flow from the central government to locally generated resources)**

This sub-section discusses the budget allocation at the district level using the case of the Otuke and Abim districts. Table 12 shows the total approved and total out-turn allocations for Otuke district from the financial years 2010/11 to 2013/14. The district's total allocation was low and varied between years. Although no reason was presented for the observed high fluctuations in the amount that was allocated in different years, the authors associated the fluctuation with funding mechanisms for new districts where, together with recurrent expenses, the central government caters

for infrastructural (offices) development. Except 2010/11, all of the other years had approved budgets that were generally higher than the total out-turns. In 2010/11, the out-turns were twice the allocations, an unexpected observation given that some activities, such as construction, must have begun before the curving out of the district and were recorded as allocation for Lira. Another reason for low outturns in relation to allocations after 2010/11 is the fact that some funds are meant for salaries and are not reported as outturns. The total outturn has consistently been low at approximately UGX6 billion, raising concern regarding the ability for fund absorption in the new district. The proportion of outturn to allocation was seven and 54 percent in 2011/12 and 2012/13, respectively.

The Allocation for Production and Marketing (P&M) ranged between seven and 10 percent of the total district budget in 2011/12 to 2013/14. The production and marketing budget covers the activities of NAADs, veterinary, entomology and fisheries,

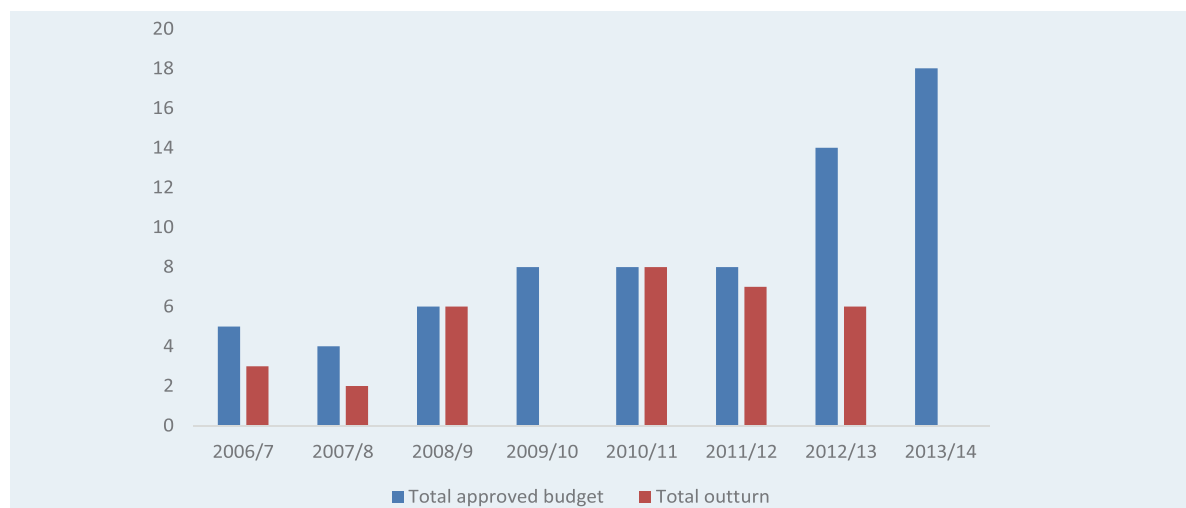
among other sub-sectors. In addition, water for production is included in production and marketing.

Figure 10 shows the total approved budget and outturns for Abim District between 2006/7 and 2013/14. The total approved budget increased from UGX 5 billion in 2006/7 to UGX 18 billion in 2013/4. Outturns were quite low compared to the total that was approved in 2006/7 and 2012/13. In 2009/10 and 2013/14, the outturn data were missing. Other years show that the outturns matched the approved budgets. Although there were no components of WfAP investment in the district's budget, in most cases, the approved budget was wholly utilized, indicating that the allocation was well appropriated. This utilization indicates that there are other competing needs in the districts that are prioritized. Opportunities for allocation for WfAP lie with the Central government budgeting processes as is the current case for the MoWE. The government could also allocate a direct vote to the district for WfAP investment.

**Table 11: Total approved budget, outturns and proportion of agricultural allocations for Otuke district between 2010/11 and 213/14**

	2010/11	2011/12	2012/13	2013/14
Total approved budget (UGX billion)	3	94	11	12
Total Outturn (UGX billion)	6	7	6	-
Proportion of outturn/allocation (%)	200	7	54	
Ratio of agricultural budget to total (%)	-	10	7	8
Ratio of agricultural outturn to total (%)	-	13	10	-

NB: \* Agricultural budget is that allocated to the Department of Production and Marketing (MoFPED 2013)

**Figure 10: Total approved budget and outturns for Abim district in UGX billions**

Source: MoFPED 2013

In conclusion, the total approved budget allocations are generally higher than the total outturn allocations, with a higher percentage of changes from the starting year to the ending year of the specified period in both districts. In particular, the percentage change for the total approved budget allocations was significantly higher in Otuke than in Abim district.

Information from district production officers in both districts reveals that with the exclusion of NAADS, the money in the P&M docket is meager and mostly covers salaries. This budget is too small to cater to WfAP activities, especially in Abim, where we see no evidence of money allocated to such activities. In Otuke, approximately UGX 4 million was allocated to purchase irrigation drips and other irrigation supplies in FY 2013/14. Allocation to WfAP is therefore small and not consistent over the indicated period.

## 7. OPPORTUNITIES AND CHALLENGES FOR INVESTMENT IN WFAP IN UGANDA

In this section, we present opportunities and challenges for investment in WfAP as reviewed through stakeholder consultation, field observation, literature and analysis of data.

### 7.1 Opportunities for Investment in WfAP in Uganda:-

- a) There is a consensus on the need for investment in WfAP among concerned stakeholders, including Ministries (MoFPED, MAAIF and MoWE) and the Office of the Prime Minister; Local governments visited; donors; and private sectors (business investors and farmers).
- b) Both policy and institutional frameworks that are necessary to facilitate WfAP have been put in place. The Irrigation Master Plan of the National Water Policy and Water Statute set the strategies and

- regulations for WfAP. Other national development plans, including the National Development Plan, DSIP, and the Vision 2040, elucidate the importance of WfAP intervention.
- c) Opportunities for increased returns, employment creation and enhanced food security exist with supplemental irrigation in Uganda.
  - d) Uganda has sufficient water resources that could be harnessed for WfAP. Water sources that are available for WfAP include water harvesting and storage during rain seasons; water transfer from existing water bodies, including lakes, rivers and dams; and the exploitation of underground water resources.
  - e) A high demand for agricultural produce exists in Uganda and in the surrounding region. Investment in WfAP will increase efficiency in agricultural production, the competitiveness of the produce in the market, and the capabilities and profitability of farmers, especially those that are involved in high-value crops.
  - f) Investment in WfAP provides opportunities for the industrial transformation of Uganda's economy. Year-round agricultural production protected from the vagaries of weather has a high potential for attracting value-adding agro-industries.
  - g) WfAP provides opportunities for Uganda to mitigate the impacts of climate change
  - h) Since the late 1990s, when the government initiated WfAP activities, a capacity has been built among the public and private sector regarding WfAP facility design, construction and supervision. The government has invested in equipment that is available for hire by the private and public sectors for WfAP facility construction.
- i) Previous interventions for enhancing agricultural production and productivity also addressed WfAP. The construction of WfAP facilities by the colonial government in the 1940s and 1950s indicates the relevance of WfAP for enhancing productivity. Furthermore, all of the existing irrigation schemes in Uganda were constructed or designed in the 1940s.
  - j) Already draft National Irrigation Policy and Master Plan are ready and their conclusion will provide policy guide on one component of WfAP in Uganda.
- 7.2 Challenges for investment in WfAP in Uganda**
- a) Investment in WfAP is very expensive due to the design, construction and compensation of land that is used for the WfAP facility. It is currently very difficult to invest in large and medium WfAP facilities because these facilities are location-specific and due to issues that are associated with land ownership and the lack of willingness of land owners to volunteer land- even at a cost.
  - b) WfAP investments calls for cooperation between beneficiaries of the initiatives, who are referred to as water users. Poor and deteriorating social cohesion (social capital) threatens operations and the maintenance of WfAP investments.
  - c) A successful WfAP initiative for Uganda will require high investment in capacity building for all stakeholders, including government officials, technical officers,

- farmers and business operators.
- d) Challenge of community access to water in large dams and other water bodies. First, the cost of technology installation is high for a low-income household that is located far from the dam, thereby restricting access to households to producing high-value crops on small plots within the radius of the dams. The production of vegetables on a few square meters per household has little potential to provide income sustainability and eradicate poverty.
  - e) For farmers that are located in distant places, irrigation pipes connecting to large dams must pass through land belonging to other households, which can cause disagreements.
  - f) In most cases, water user committees volunteer their services. Volunteers are not motivated to continuously offer their services in expense of paid activities. The lack of remuneration has led to water user committees being inactive, culminating in failure in operating and maintaining of WfAP facilities.
  - g) Irrigation activities have been largely promoted by partners as best practiced for high-valued crops, yet drought affects a host of crops, which poses further challenges to ensuring food security and poverty reduction.
  - h) Irrigation initiatives, especially in the Northern region, are being promoted or demonstrated as groups activities. Concerns regarding the sustainability of the WfAP are rife, especially where group members must volunteer labor to dig pits until the point at which all of the members are served. Furthermore, the endeavor is labor intensive and is associated with long waiting before benefits are observed. For example, a pit dam by the Par Pii Anyim Farmer Group (Otuke District) of approximately 126 m<sup>3</sup> took 88 man-days to excavate. Although only 1 member out of the 31 has been covered, this group's members have raised concerns over absenteeism during communal work. Moreover, this group has received financial and technical support from development partners for the current achievements.
  - i) The average cost of investing in a small-scale irrigation project at the household level is high, especially where farmers must design, construct and maintain water harvesting and storage infrastructure.
  - j) Technologies for water harvesting, storage and transfer being disseminated appear very rudimentary, cheap and labor intensive, raising concerns regarding their sustainability and effectiveness. The assumption is that farmers are very poor and have extra labor that has no financial value or other competitive use.
  - k) The influx of counterfeits and low-quality WfAP equipment in Uganda is a major risk for investment. Available pumps, pipes and drips in the market are of very low quality and will hinder the adoption of WfAP.
  - l) Failure to address the entire value chain in WfAP from agricultural extension, seeds, fertilizers, crops' cultural management, post-harvest losses and marketing.
  - m) The working relationship between the MoWE and the MAAIF. Although the MoWE addresses WfAP at the off-farm level and the MAAIF mandate

is on-farm, the failure of the two to collaborate in their WfAP investments has affected the achievement of the desired goals. The MAAIF is unable to construct WfAP facilities, while those that are constructed by the MoWE are not in use. Despite Article 108 A of the Uganda Constitution mandating the OPM with the responsibility of the coordination and implementation of government policies across ministries, departments and other public Institutions, disharmony between the MAAIF and MoWE continues to constrain efficiency for investment on WfAP. The OPM should respond and have responsibility bestowed upon it by the Constitution. Moreover it would be important to evaluate the representation and participation in WPC by the MAAIF and MoWE with a view of enhancing cooperation, inclusiveness and efficiency on WfAP matters.

- n) Investment in WfAP is beyond LoG due to cost implications. The local government resource base is low and was exacerbated by the removal of graduated tax
- o) Environmental Management concerns. The Uganda economic growth potential is based on the exploitation of natural resources. However, the prevailing paradigm of environmentalists is of natural resource preservation. The prevailing natural resource management paradigm presents a major threat to WfAP. Areas with the greatest potential for WfAP are the wetlands, which the Wetland Department and NEMA are keen to preserve. The diversion of water courses or cultivation close

to the river has been considered as invasion of wetlands. What the country needs is a categorization of wetlands and other water bodies based on their conservation needs. A good example could be borrowed from the Ramsar sites, which are water bodies of international importance due their habitat of migratory or other birds.

## 8. DEVELOPING A SUSTAINABLE WFAP INFRASTRUCTURE FOR SMALLHOLDER FARMERS

Uganda agricultural production is dominated by smallholders' producer whose operating environment has made this producer a subsistence farmer. Although various development plans, including DSIP, PEAP, Vision 2040 and NDP, among others, have recommended the commercialization of agricultural production, budget allocation and investment in WfAP remain low. The provision of WfAP remains the critical intervention that will enhance production and productivity, considering the increasing population density; high risks that are associated with the vagaries of weather; high crop and livestock output losses that are associated with drought; and the threat that is presented by climate change. The availability and access to WfAP will enhance the adoption of high-yielding technologies, including fertilizer, seeds and even shifts to high-value crops due to a reduction in the risk that is associated with drought and the opportunity for year-long production. A review of the WfAP in Uganda shows efforts that are in an infant stage in which policy documents are being drafted; budgets allocations are very low;



and the concerned institutions have yet to agree on the best strategy to address the challenge of increasing the access to WfAP of farmers. Moreover, technologies that are being disseminated by various stakeholders to farmers are rather rudimentary. The use of bottled water and pit tanks, fetching and pouring water on crops and the organization of users are inefficient considering their labor intensity and the prevailing social capital.

### **8.1 Increasing budget allocation for WfAP to benefit smallholders**

Although budget allocations and outturn have increased in the last seven years, investment in WfAP requires a substantial amount of money due to the need to undertake detailed feasibility studies, complex designs and engineering works and high costs of construction and supervision of the WfAP facilities. Most of the financing that has so far been undertaken only addresses minor rehabilitations of irrigation schemes facilities and the development of WfAP micro-systems that may not sufficiently address the country's desired levels for increased agricultural production and productivity. For example, financial support through FIEFOC only addresses the partial rehabilitation of existing irrigation systems; Akwera dam rehabilitation by the MoWE; valley tank construction and rehabilitation in Abim; and the training of a few farmers around WfAP to entice them to form a water-user association. There is a need for continued investment for WfAP through financing by both the private and public sectors. The factors that could improve the allocation of budgets for WfAP by both the public and private sectors include the following:

a) Revealing the actual production losses

that are experienced by farmers due to sporadic and severe drought. In addition, the annual evaluation of the impacts of droughts and the resultant productive losses to food security, employment, household wellbeing and the entire economy need to be undertaken. Understanding the impact of losses due to drought permits an undertaking of the cost benefit analysis on investment in WfAP.

- b) Harnessing a good working relationship between the government agencies (MAAIF, MoWE and OPM) and other stakeholders in planning, designing and constructing WfAP facilities and the building capacity for farmers to sustainably operate and maintain the facilities.
- c) Enhancing the capacities of the existing institutions and institutional frameworks to advocate, promote, develop, regulate, supervise, maintain and research WfAP. The proposed institution should also harmonize operations of ministries working on WfAP.
- d) Development of a comprehensive plan for WfAP that incorporates the socio-economic characteristics of communities; water resource availability; potential cropping patterns with optimal profitability; requirements for sustainable operations and the maintenance of facilities; and enhancement of other related value-chain activities that will impact the efficiency of WfAP.
- e) Efforts should also be addressed to promote WfAP among households to increase the demand for and adoption of the facilities. However, promoters should evaluate the costs



and effectiveness of the technology being disseminated. The promotion of mechanized WfAP technologies would increase the adoption and demand for investments and could evolve into a unique business opportunity for pump owners.

## **8.2 Enhancing access of sustainable WfAP for the smallholder**

It is important to specify that the strategy could assure smallholders' access to water for production whenever they need it. An assumption is made that the availability of water for irrigation will ensure access for livestock and aquaculture. A critical review of existing and proposed strategies of irrigation in Uganda indicates two categories (GoU 2010; MoWE 2010). These strategies include the development of micro-dams, which advocate for individual farmers or groups of farmers owning a water storage facility. In this case, the water is harvested from either rainfall or flash flood in a small catchment within individual farmers' land or in an area that is shared by a group of farmers. Micro-dams entail farmers digging a dam that could be lined with non-permeable material. Other forms of micro-dams include valley tanks. The advantages of this form of facility include the requirement of little financial resources to construct; simple to operate; individually owned, thereby avoiding conflict regarding who operates and maintains; void of conflict of water allocation; and easily adoptable by many farmers.

The disadvantages of micro-dams include the requirement of labor to excavate pits; the result of high losses in case the non-permeable material leaks; the dams holding only a small amount of water, which may not be sufficient to cover farmers throughout a

drought period; vulnerability to failure to collect sufficient water; associated with dirty water due to their water-harvesting techniques, making these dams unusable for domestic, livestock and aquaculture; dangerous at homesteads, as people, especially children, can be drowned; and provide grounds for the multiplication of vermin and pests, including mosquitoes and frogs. The techniques that are being proposed for water lifting are also labor intensive. Some of these techniques include using containers (buckets) to fetch and pour onto the crop and the adoption of simple treadle pumps.

A second approach involves the construction of large dams and the design of irrigation schemes. This approach requires high capital outlay, and a project's payback period is longer, at least 20 years. Investment in large dams is mostly undertaken by governments through financial support from multinational agencies. Examples of large dams and irrigation schemes include Doho (4380 farmers), Olgweny (544 farmers), Mobuku (262 farmers), Agoro (142 farmers) and Kibimba (Tilda, Estate managed). The components of large dams include embankments to stop the flow of water and to create a large water reservoir, an intake structure or (main) pumping station, a conveyance system, a distribution system, a field application system, and a drainage system. The management of irrigation schemes is complex and expensive. Although built and frequently rehabilitated through public financing, schemes in Uganda have been allocated to smallholder farmers. In most cases, each farmer is allocated 2 acres of land within the irrigation fields. Except for Kibimba, other schemes in the country have always failed performance tests, with

government regularly being called in to rehabilitate the dams due to the inability of farmers to operate and maintain the facilities.

The main challenges facing irrigation schemes include their high cost of operation and maintenance; serve only a small number of farmers; prone to risk of breakdown and dysfunctional; require high skill in facility management and water users' governance; and are very selective on who gets allocated land within the irrigation schemes. Some of the advantages of the irrigation schemes include water being readily available, opportunities of subsidizing from the government and the low per-capita cost of water.

Designing a sustainable irrigation system for Uganda necessitates the incorporation of lessons from both the micro-dams and the large dams systems and an analysis of farmers' socio-economic characteristics, water resource availability, terrain and technology availability. While micro-dams have the benefits of adoption by a large number of farmers, their efficiency is still questionable. Moreover, micro-dams are in an infant stage of development, and no information on their potential for adoption and return of costs is available. Conversely, the country's experience with large irrigation schemes may hinder their development. Furthermore, over the last more than 40 years, the country has never established any new irrigation scheme. Together with the development of micro-dams and large schemes in which the benefits surpass the costs, we propose the development of public-private initiatives for irrigation. The government should focus on the construction of medium-sized water

facilities, mostly the valley dams that we consider more efficient and affordable than large dams.

The government should be involved in the construction of a water reservoir upon which it should concession the pumping, conveyance and distribution of water to private entities. The modalities of farmers connecting to the water distribution systems should be put in place. In this case, as domestic water users or electricity users connect to the nearest network, farmers should also do the same. Medium-size water reservoirs, e.g., valley dams, should be constructed by the government in various locations in the country. Modern water-lifting and pumping technologies should be used to convey and distribute the water to farmers through pipes. Lifting and pumping technologies that could be adopted by private actors and that are available in Uganda include power, thermal and solar pumps. The adoption of modern technologies will enhance efficiency in water management and distribution capabilities. The provision of water for domestic use in Uganda is a good example of how the system could work. The National Water and Sewerage Corporation (NWSC), together with the Association of Private Water Operators (APWO), have overseen an increase in the domestic water connections and revenue collection. The proposed irrigation authority or board should play a role in the regulatory agency and collaborate with private agencies to ensure that farmers have access to water for irrigation. Farmers should pay for the water that they use. Opportunities for the subsidy of WfAP should be considered, as is the case with poor domestic users who are served by the NWSC. The government should guarantee private agencies that are involved in dam

construction and operations to be able to secure international financial assistance in either loans or grants. An international private sector should also be facilitated to build, operate and transfer dams.

Already, the Akwera Valley Dam in Otuke has been rehabilitated by the MoWE. Just before the onset of the rains in May 2014, the water volume was estimated at 1.2 million m<sup>3</sup>; irrigation is restricted to a hectare of land operated by Bediwore Youth Group. A combined gravity flow and drip irrigation system has been adopted at approximately 400 m from the dam site. To benefit, the 56 group members must work collectively in the one hectare, earn profits and share them among members. Beyond the demonstration by the youth group, it is necessary to ensure that water is conveyed and distributed to farmers. A concession to a well-equipped and experienced private actor would ensure that water is distributed wide and far. In this case, the private actor installs the water-lifting and pumping facilities, lays the main pipes, operates and maintains the network and charges farmers for the water that they. The farmers will lay subsidiary pipes to their farms from the main pipe, use water for irrigation and pay some fees to cover the distribution cost and recovery of the dam investment amount by the government.

Investment in simple modern water-lifting technologies could have pushed the Akwera Valley Dam water to a large number of farmers. Our estimation shows that the water could have been lifted and pumped beyond a distance of 3 km to the North, approximately 5 km to the South, 10 km to the North East and approximately 12 km to South East. The simple technologies are being retailed

in Kampala at less than Uganda shillings (UGX) 1 million (Davis & Shirtliff 2014). More-sophisticated modern technologies are also available in shops in Kampala that could lift and push water to a radius of above 20 km and to heights of greater than 50 m. The adoption of simple technologies will provide youth with employment in the irrigation value-chain and boost agricultural productivity for smallholders. Except during their early stage, which accounts for less than two percentage of the length, most of Uganda's rivers and valleys are shallow and permit simple water-lifting and pumping techniques. The promotion of the opportunities that are provided by the lifting, pumping and conveyance of water for irrigation will provide rural-based employment and enhanced productivity.

## REFERENCES

- African Capacity Building Foundation-ACBF (2012). Africa Capacity Indicators 2012: Capacity Development for Agricultural Transformation and Food Security, ACBF, Harare, Zimbabwe.
- Biellik, R. J. and P.L. Henderson (1981), Mortality, nutritional status, and diet during the famine in Karamoja, Uganda, 1980. *The Lancet* 318: 1330-1333
- CAADP, (2003), Africa's Framework for agriculture, NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP), NEPAD, November 2010.
- Carruthers, I.D. (1970). Irrigation development in Uganda: past experience and future prospects. *East Africa Geographical Review*, 8: 11-22.
- Concern Universal and Irish Aid (2012). A

- Study of the Economic and Social Impact of Three Irrigation Schemes in Debza and Ntcheu Districts. Concern Universal, Blantyre, Malawi. June 2012. Available at <http://www.concernuniversal.org>
- Davis & Shirleaf (2014). Davis & Shirleaf 2014 Product Manual. Davis & Shirleaf, Kampala, Uganda.
- Food and Agriculture Organization (FAO) of United Nations (2005). Irrigation in Africa Figures, AQUASTAT Survey 2005, FAO.
- Food and Agriculture Organization (FAO) of United Nations & Sub-Regional Office of East and Southern Africa (SAFR), (2000). Socio-Economic Impact of Smallholder Irrigation Development in Zimbabwe., FAO, Harare, Zimbabwe.
- Government of Kenya, (2008a). First Medium Term Plan 2008-2012: Kenya Vision 2030, A Globally Competitive and Prosperous Kenya. Ministry of Planning, National Development and Vision 2030, Nairobi, Kenya.
- \_\_\_\_\_ (2008b). The Kenya Vision 2030. Ministry of Planning, National Development and Vision 2030, Nairobi, Kenya.
- Government of Uganda (2011). National Development Plan 2010/11-2014/15
- \_\_\_\_\_ (2007). Climate Change: Uganda National Programme of Action (NAPA), GoU, Kampala, Uganda.
- Hagos, F., Makombe, G., Namara, R. E. and Awulachew, F.B. (2009). Importance of irrigated agriculture to Ethiopian economy: capturing the direct net benefit of irrigation. Colombo, Sri Lanka, International Water Management Institute. 37p (IWMI Research Report No. 128)
- Hartwig, G.W. (1979). Demographic considerations in East Africa during the Ninetieth Century. *International Journal of African History*, 12(4): 653-672
- International Monetary Fund (IMF) (2010). IMF Staff Country Report. IMF Country Report No. 10/141. Washington DC. USA.
- Jaetzold, R. and Schmidt, H. (2010). Farm Management Handbook of Kenya. Vol II. – Natural Conditions and Farm Management Information. Ministry of Agriculture, Nairobi, Kenya.
- Karamoja Livelihoods Programme (2009). KALIP Technical Reference Guide. KALIP, OPM, Kampala. November 2009, 88pp.
- MAAIF (2012). Proposed Plan to Operationalize the non-ATAAS Components of the Agriculture Sector Development Strategic and Investment Plan. MAAIF, Kampala, Uganda.
- \_\_\_\_\_ (2010a). Agriculture Sector Development Strategy and Investment Plan: 2010/11-2014/15
- \_\_\_\_\_ (2010b). National Agriculture policy, Final draft
- \_\_\_\_\_ (2009a). Policy Statement for the Ministry of Agriculture, Animal Industry and Fisheries for the Financial Year 2009/10
- \_\_\_\_\_ (2009b). Comprehensive African Agricultural Development Program-CAADP. Working Documents, PMA secretariat.
- \_\_\_\_\_ (2005). The National Irrigation Policy, Revised Final Draft.
- \_\_\_\_\_ (1995). *Basic facts on agricultural activities in Uganda*
- Ministry of Finance and Economic Planning (MINECOFIN) Republic of Rwanda

- (2014). Budget Framework Paper 2014/15-2016/17. MINECOFIN, Kigali, Rwanda
- Ministry of Finance, Kenya (The National Treasury) (2013). Medium Term, Budget Policy Statement. The National Treasury, Nairobi, Kenya.
- Ministry of Finance, United Republic of Tanzania, (2011). Government Budget for Financial Year 2011/2012. Ministry of Finance, Dar es salaam, Tanzania.
- MoFPED (2011). Background to the Budget 2010/11 Fiscal Year: Strategic priorities to Accelerate Growth, Employment and Socio-economic Transport for Prosperity, Republic of Uganda
- \_\_\_\_\_ (2005). Budget Framework Paper 2005/06 2006/07.
- Ministry of Water and Environment (2013). Ministry of Water and Environment Ministerial Statement 2012-2013. MoWE, Kampala, Uganda.
- \_\_\_\_\_ (2012). Ministry of Water and Environment Ministerial Statement 2012-2013. MoWE, Kampala, Uganda.
- \_\_\_\_\_ (2011). A National Irrigation Master Plan for Uganda (2010-2035), Final Report, November 2011.
- \_\_\_\_\_ (2009a). Strategic Sector Investment Plan for the Water and Sanitation Sector in Uganda. MoWE, Kampala, Uganda.
- \_\_\_\_\_ (2009b). Revision of the water for production strategy and investment plan, Final report, August 2009.
- \_\_\_\_\_ (2008). Sector strategic plan for statistics, 2007/2008-2011/12
- \_\_\_\_\_ (1999). The National Water Policy
- Mugerwa, S., S. Kayiwa and A. Egeru (2014). Status of livestock water sources in Karamoja Sub-Region, Uganda. *Resources and Environment 4(1): 58-66.*
- Mwaura, F.M. and Okoboi, G. (2014). Climate variability and crop production in Uganda. *Journal of Sustainable Development, 7 (2): 159-172.*
- Mwebaze, S.M. (2014). Uganda Country Pasture/Forage Resource Profiles. <http://www.fao.org/ag/AGP/AGPC/doc/counprof/uganda.htm#2>. SOILS AND TOPOGRAPHY.
- New Partnership for Africa's Development (NEPAD) and FAO (2004). Support to NEPAD-CADDP Implementation: National Medium Term Investment Programme (NMTIP). FAO, Kampala, Uganda.
- Office of Prime Minister (2012). The 2010–2011 Integrated Rainfall Variability Impacts, Needs Assessment and Drought Risk Management Strategy. Department of Disaster Management, OPM, Kampala, Uganda.
- Otuke District Production Department (2013). Production and Marketing Department Report 2013, Otuke District.
- Ssewanyana, S. and Kasirye, I. (2010). Food security in Uganda: A dilemma to achieving the Millennium Development Goal. EPRC Research series No. 70. July 2010.
- UBoS, (2011). Consumer Price Index June 2011. Kampala, UBoS.
- \_\_\_\_\_ (2007). Statistical Abstract 2007, Kampala, UBoS.
- UDN (2002). Monitoring of the Poverty Action Fund Annual Report, Uganda Debt Network Policy Department.
- United Nations Convention to Combat Desertification (UNCCD), (2008). Budget processes and Financing Instruments in Uganda,-Towards Increased Financing for the

Implementation of the UNCCD, The Global Mechanism of the UNCCD.

United Nations Department of Economic and Social Affairs (UNE-DESA) (2012). Synthesis: Review of Implementation of Agenda 21 and Rio Principle. UN, NY.

Wanyera, M and Davies, F. (2012). Uganda Macroeconomic Policy Co-ordination and Management, Ministry of Finance Planning and Economic Development

(MoFPED) and Overseas Development Institute (ODI).

World Water Assessment Report (2005).

National Water Development Report for Uganda: Prepared for the 2nd UN World Water Development Report, UN-WATER/WWAP/2006/9.

Wortman, C.S. and Eledu, C.A. (1999).

Uganda's Agro-Ecological Zones: A Guide for Planners and Policy Makers. Kampala, CIATS

## APPENDIX 1 AGRO-ECOLOGICAL ZONING IN UGANDA AND CROP RECOMMENDATIONS

Agro-ecological zone	Rainfall range (mm)	Altitude	Farming system	DSIP classification
West Nile Farmland	900-1500	800-1800	Annual crops & cattle	North-west savannah grasslands
Northwest farmland-wooded savanna	700-1700	500-1500	Annual crops & cattle	-
Northern Moist farmlands	700-1700	1000-1200	Annual crops & cattle	Para Savanna
Northern-Central grass-bush-farmland	700-1500	900-2500	Annual crops & cattle	North Eastern Savanna grassland
Northern semi-arid short grass plain	300-1300	900-3000	Pastoral with few annual crops	North-Eastern Drylands
Western Mid-altitude farmlands	500-1700	700-1600	Banana, millet, cotton & cattle	-
Central wooded savannah	700-1300	900-1300	Banana, millet, cotton & cattle	Pastoral rangelands
Southern & Eastern Kyoga basin	700-1700	900-1300	Banana, millet, cotton & cattle	Kioga plans
Mount Elgon	900->2100	1000-4000	Intensive banana & coffee, forests	Highland ranges
Western Medium high farmland	500->2100	600-4500	Banana, coffee, cattle and forests	South-western farmlands
Southern grassland	300-1100	1100-2000	Banana, coffee, cattle and some annual crops	Pastoral rangelands
Lake Victoria crescent & Mbale farmlands	700->2100	1100-2400	Banana, coffee, millet, cotton & annual crops	Lake Victoria crescent
Ssese islands & Sango plains	700->2100	1100-1300	Intensive banana, coffee, & annual crops	Lake Victoria crescent
Southwestern highlands	700-2100	1100-4000	Annual crops and forests	Highland ranges

DSIP Zoning that was considered by the Agricultural Sector Development Strategy and Investment Plan: 2010/11-2014/15



## APPENDIX 2: LIST OF INDIVIDUAL CONSULTED DURING THE KIIS

Miriam Imalingat	CARE Gulu	Gulu
Tom Ajok	Chairman, Bediwoyo Y. Group	Otuke
David Onap	Bediwoyo Y. Group	Otuke
Edward Orech	Water Officer	Otuke
Patrick Aluk	Champion Farmer, Olilim, Otuke	
Martin Akanya	TSU	Lira
Francis Edimu	TSU, Unit	Soroti
Celestine Atupa	Farmer, Par Pilngim FG	
Joseph Atia	Deputy CAO,	Otuke
Julias Aluke	Statistician,	Otuke
John Angoo	Champion Farmer, Orum S.C	Otuke
Samuel Ebonga	District Agricultural officer	Otuke
Dr. Anyuru Thomas	Production and Marketing	Otuke
Jabber Abdul	Balton Ltd	Kampala
Justine Odong	Production and Marketing Officer	Abim
Tom Etil		Abim
David Ochan	Planning Officer	Abim
Kennedy Igbokwe	Project Manager, GCCA	FAO, Uganda
Paul Lubega	JICA	Kampala
Martin Fowler	USAID	Kampala
Joseph Oryokot	World Bank	Kampala
Patrick Omedi	WHH	Otuke
Matovu Mbagaruzinde	Davis & Shirleaf	Kampala
Anonymous APWO member	Association of Private Water Operators (APWO)	Kampala
Denis Kamugisha	National Water and Sewerage Corporation (NWSC)	Kampala
Dr. Moses Isarbiya	Busitema University	
Eng. Ronald Kato	MAAIF	Kampala
Eng. Henry Kizito	MoWE	Kampala
Eng. Patrick Okotel	MoWE	Kampala
Eng. Kasozi Tondo	MoWE	Kampala

## APPENDIX 3 CHECKLIST QUESTIONS FOR KEY INFORMANT INTERVIEW

### A. Interview Guide for District Officials

- How far is the District involved in the planning, budgeting and implementation of WfAP?
- Which activities are the district involved in during the public investment in WfAP?
- How does the Central Government allocate money to your Districts?
- Which public projects and services are the district involved in planning, budgeting and implementation?
- For those public projects and services that the district undertakes, could you share with us the procedures that are taken to execute them?



- Do you have any sites with potential for WfAP in the District that have yet to be developed?
- How many of these sites are known by the Central Government?
- Do you think that the government has given WfAP the priority that it deserves?
- Do you have any avenue to influence WfAP projects?
- What is the best approach to influence allocations for WfAP
- Do you think that the community participation in budgeting for WfAP is sufficient?
- Do you think that the current policy and institutional framework for WfAP are sufficient?
- How does the MOWE engage you as it undertakes WfAP investment?
- How does the MAAIF engage you as it undertakes WfAP investment?
- Do you engage private actors in any investment or services in the District? If so, in which sub-sectors?
- What are the observable benefits of investing in WfAP for smallholder farmers?
- Could you highlight the risks and opportunities in investing in WfAP (Public and private sectors)?
- Are you aware of any Waters User Association Members in the district? How do you rate their potential for managing WfAP investments?
- To what extent are smallholder farmers targeted by investments in WfAP?
- What impacts do you think the smallholder farmers have on investment in WfAP?"

**B. Civil Society Organization that is involved in WfAP**

- Factor influencing investment in WfAP for the CSOs
- Particular activities you are undertaking on WfAP
- Levels of engagement with the government ministries, department and agencies involved in WfAP.
- Levels of engagement with local government structures
- Sufficient policies for CSOs engaging in WfAP activities
- Existing and past WfAP projects that have been implemented by the CSOs
- Drivers of policy change in WfAP
- Risks and opportunities in investing in WfAP for CSOs
- Implementation challenges that are experienced by the CSOs on WfAP
- What extent are your activities targeting smallholder farmers and women?
- Observable benefits of investing in WfAP for small holder farmers
- Proposal of interventions that are necessary for the successful implementation of WfAP

**C. Leading Questions for Ministries, Departments and Agencies**

- Planning and budgeting for WfAP
- Drivers of budget allocation for WfAP
- Adequacy of budget allocations
- Best approaches to influence allocations for WfAP
- Community participation in budgeting for WfAP

- Effectiveness of policy and institutional framework for WfAP
- Policy consistencies
- Coordination with MAAIF on WfAP issues
- Levels of engagement with local government structures
- Actors that are involved in WfAP (funding & implementation)
- Existing and past WfAP projects that are implemented by the ministry
- Levels of engagement with private actors
- Drivers of policy change in WfAP
- How far have we gone towards adhering to the CAADP?
- Risks and opportunities in investing in WfAP (Public and private sectors)
- Challenges that are encountered (policy, Institutional, etc.)
- To what extent are smallholder farmers targeted by investments in WfAP?
- Observable benefits of investing in WfAP for small holder farmers

#### D. Interview Guide for Donors

- What are the existing interventions by your organization to promote smallholder farmer access to WfAP in Uganda?
- Who are the key actors with which you engage in the public and private sectors to promote investment and implementation of WfAP activities in Uganda, and what is the nature of the engagement?
- What are the challenges that are faced by Donors/CSOs in promoting access to WfAP, and how can they be solved?
- In your opinion, what are the challenges facing the funding and implementation of WfAP activities?
- How effective is Uganda’s policy and institutional framework for smallholder WfAP?
- What is your assessment of the capacity of actors at the local government and lower levels to effectively plan, budget for and implement WfAP activities?
- What interventions would you suggest to increase funding for WfAP?
- How can the potential of the private sector be harnessed to promote WfAP among smallholder farmers?
- What policy gaps would you suggest for the effective implementation of WfAP projects

## APPENDIX 3 TIMELINE OF THE SECTOR BUDGET PREPARATION PROCESS IN UGANDA

Timeline	Budget activity	Description of activity	Concerned institution
October	Cabinet retreat	Resource projections Issues and priorities Initial MTEF ceilings	Cabinet
October	National BFP workshop	Guidelines for sector BFPs Outlook and priorities Initial MTEF ceilings	MoFPED

November	Preparation of sector BFP	Preparation of draft sector BFP including RTBs and DTBs for agencies Revision of MTEF allocations consistent with sector resource ceiling	MAAIF
December	SWG retreat	Ministerial consultations Preparation of preliminary estimates of the Finalization of SBFP	MAAIF
January	Compile BFP	Preliminary sector estimates sent to MoFPED Compile BFP Update MTEF allocations	MoFPED
February		Preliminary estimates sent to President Finalize BFP	MoFPED
March	BFP to Cabinet	Cabinet reviews and recommends	Cabinet
April	Preliminary estimates to parliament	Parliament reviews and recommends	MoFPED Parliament
May		Parliament recommends estimates PER meeting Finalize national budget	Parliament MoFPED
June		National budget read	MoFPED
July	Budget approval	Parliament approves budget	Parliament

Source: Adapted from The Global Mechanism of the UNCCD (2007). Budget processes and financing instruments in Uganda: Towards increased financing for the implementation of the United Nations Convention to Combat Desertification

## (ENDNOTES)

- 1 National Development Plan is a successor of PEAP with the country moving from a focus on poverty to a focus on development
- 2 This law will soon be replaced with a new act, namely the Public Finance and Management Act, which at the time of writing this report, was still a bill before parliament.
- 3 This schedule will soon be changed in the new Public Finance and Management Act
- 4 *Personal Communication*
- 5 The technical team for WfAP includes the District's Production Officer; the Water Officer from the Works and Technical department; and an Engineer.
- 6 A private company collaborating with the MoWE in WfAP project implementation.
- 7 A non-government organization that is involved in development in Abim District
- 8 Graduate tax existed until 2001 when it was scrapped. This was also known as poll tax where all males of 18 and above were liable.













**Economic Policy Research Centre**

Plot 51, Pool Road, Makerere University Campus  
P.O. Box 7841, Kampala, Uganda  
Tel: +256-414-541023/4, Fax: +256-414-541022  
Email: [eprc@eprc.or.ug](mailto:eprc@eprc.or.ug), Web: [www.eprc.or.ug](http://www.eprc.or.ug)