POLICY BRIEF ON FINANCING AGRICULTURAL RESEARCH IN UGANDA

An Exploration of the National Agricultural Research Organization (NARO) Funding

Produced by CSBAG Budgeting for equity

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EMBASSY OF SWEDEN

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1 Introduction:

As part of increasing the availability and usage of evidence among policy makers in influencing agriculture budget decisions, Civil Society Budget Advocacy Group[1] (CSBAG) has produced a policy brief on financing agriculture research. This policy brief explores funding challenges associated with agricultural research in Uganda focusing on NARO as the mandated institution. The brief highlights the funding gaps faced by NARO, expenditure priorities of the institution, current funding sources and their reliability, beneficiary perceptions regarding research outcomes, and policy alternatives available for turning around the sector through research and technology development.

The findings of this research will be used to engage government on increased prioritization of agriculture research in Uganda. It has been proved that agricultural research has a direct benefit to the poor small scale famers and that agriculture research improves productivity and production of livestock and crop farming. World Bank believes that at least 2% of the national budget should be dedicated to agriculture research, in Uganda it currently stands at 0.01% of the national Budget FY 2013/14.

CSBAG acknowledges the support and information accorded to it by the Director General of NARO, and the Director Finance- NARO as well as from farmers in Kamuli District, Fort Portal, Apac, Kanungu, Bugiri, Wakiso District, and Dokolo District in Lango sub-region.

1 Civil Society Budget Advocacy Group (CSBAG) is a coalition formed in 2004 to bring together civil society actors at national and district Levels to influence Government decisions on resources mobilization and utilization for equitable, gender responsive and sustainable development.

2 Background:

32% of GDP

is provided by Agriculture Sector in Uganda

85% of total

expenditure earnings in Uganda are contributed by Agriculture Sector in Uganda

60% of Uganda's population

is employed in agriculture

Agriculture is one of the key sectors of any nation's economy and its central position in engendering economic growth and development is widely acknowledged[1]. In Uganda, it is a key sector, providing up to about 32 percent of Gross Domestic Product (GDP) and 85 percent of total export earnings[2].Agriculture further employs over 60 percent of Uganda's population with women and children participating more in the sector. In driving a nation's development, the sector is the most effective in alleviating hunger, poverty and malnutrition for the most part in developing economies[3]. One of the most important ingredients in agricultural led development is that of scientific research. Supported by prudent policies and investments, science-led agriculture is very instrumental in reducing poverty, hunger and malnutrition, hence spurring economic development[4]. It suffices to note that without meaningful research and development in the agricultural sector; there will be less or no information for policy formulation and funding agencies. Additionally, transfer of research-induced technologies to farmers will be undermined thereby making it difficult to ensure sustainable productivity in agriculture. Above all, there will be absence of feedback to scientists regarding the type and nature of technologies that have greater efficacy at farm levels.

It was probably in recognition of the above that agricultural policy formulation in Uganda witnessed a paradigm shift in the past nine years. This shift was featured by focus on research and development, and heralded the establishment of the National Agricultural Research Organization (NARO) in 2005 with clear objectives of; transforming agricultural

1 Adenike O (2010) The role of research in agricultural development. National Horticultural Research Institute P.M.B. 5432, Ibadan, Nigeria

2 UBOS (2012), Annual Statistical Abstract for the Uganda Bureau of Statistics

3 GCARD (2010) Transforming Agricultural Research for Development (AR4D) Systems for Global Impact, World Development Report (2008), Agriculture for Development

4 GCARD (2010) Transforming Agricultural Research for Development (AR4D) Systems for Global Impact, World Development Report (2008), Agriculture for Development

production into a modern science-based market oriented agriculturecapable of greater efficiency, profitability and of sustaining growth in the agricultural sector while contributing to poverty reduction and supporting the development and implementation of national policy with relevant information and knowledge[5].

The agricultural sector, however, has posted poor performance over the past years, putting the livelihoods of majority of Ugandans at risk which has negative implications on the country's economy export earnings. The table that follows presents a mixed picture of the sector's growth performance over the period in question.

5 *MAAIF (2013) Annual performance report for the Ministry of Agriculture Animal Industry and Fisheries*

Table 1: Real GDP growth for Agriculture Sector, 2010/11 to 2013/14

	2010/11	2011/12	2012/13	2013/14
Agricultural Sector GDP	1.2	0.8	1.3	1.5
Cash crops	-1.5	8.2	3.5	3.3
Food crops	0.7	-1.7	0.2	1.9
Livestock	3.0	2.8	3.4	3.3
Forestry	2.8	3.3	2.0	2.2
Fishing	1.8	1.9	2.5	-5.1

***Source:** Background to the budget by MFPED, 2014/15*

less than
2%

"…the agricultural sector has been posting poor growth of less than 2 percent in the past four years, with some sub-sectors like fishing posting negative growth in 2013/14".

From the figure above, it is clear that the agricultural sector has been posting poor growth of less than 2 percent in the past four years, with some sub-sectors like fishing posting negative growth in 2013/14. This implies that despite the sector's indispensability in spurring growth and policies formulated to ensure the same, its growth performance is still not convincing. This makes Uganda's much celebrated growth strides unsustainable in the future.

NARO's specific mandate is to undertake, promote and coordinate research for crops, livestock, fish and forestry and to ensure the dissemination and application of research results. This mandate is executed with the major goal of "enhancing the contribution of agricultural research to sustainable agricultural productivity, economic growth, food security and poverty eradication through generation

and dissemination of appropriate technologies, knowledge and information".

NARO's goal is spot on since the contribution of agricultural research to growth and development is widely acclaimed. Agricultural research posts feasible returns to investment and its efficacy in turning around the growth in agricultural productivity is undoubted by development practitioners and policy makers globally. However, to ensure that agricultural research effectively contributes to economic growth, food security and poverty alleviation through generation of appropriate technologies, proper funding for national agricultural research must be ensured.

Even with widespread knowledge regarding the high rate of returns from public agricultural research, public funding of agricultural research has been and continues to be on a declining trend[6]. In Uganda, agricultural research funding level is a dismal 2 percent of the national budget, and less than ten percent of Gross Domestic Product (GDP), quite below the Comprehensive African Agricultural Development Program (CAADP) target[7]. Yet if new technologies and research paradigms are to be developed that specifically address the needs of the poor, then funding for international and national agricultural research must be increased[8].

The 2014/15 budget for NARO constitutes a dismal 8 percent of its budget coming from the government, leaving over 90 percent to be covered using donor funds[9]. This has several implications for the future of agricultural research in Uganda and its intended benefits.

Only **8 %**

of NARO's FY 2014/15 budget is financed by the Uganda Government.

6 IFPRI (2010)

7 Lukwago (2010), Increasing Agricultural Sector Financing, "Why it Matters for Uganda's Socio-economic Transformation´. ACODE Policy Research Series, 2010 pp 3

8 IFPRI (2010)

9 CSBAG, (2014) CSOs & NARO strategies for improved public investment for agriculture research, CSBAG Breaking News Series

Firstly, reliance on donor funding puts sustainability at risk which makes implementation of research activities and other related activities in national agricultural research system at stake.
Donor funding which in most cases is featured by lack of predictability undermines not only the effectiveness of research outputs in impacting on society but also performance of the national agricultural research system.

In Uganda for instance, although the 2013/14 annual budget monitoring report revealed a 60-69 percent agricultural sector performance which was rated as good, research in the sector and its intended outcomes are still not significant[10]. This performance was immensely contributed to by the Agricultural Credit Facility (ACF) which also was permeated by highly skewed distribution of beneficiaries with more concentration in the central region. The only element of sector performance highly associated with research and technology development (under NAADS) was further featured by not only inadequate funding but also allocative inefficiencies. Prioritization of expenditure was on wages for staff, leaving only 30 percent to dissemination of technologies to farmers. This indicates that besides inadequate funding alluded to earlier, apparently poor allocation of the already inadequate funds for agricultural research in Uganda does exist. This partially contrasts sharply with one of the strategies of Uganda's vision 2040 (one of the development documents that guides Uganda's development) which emphasizes continued investment in technology improvement through re-search for improved seeds, breeds and stocking materials.[11]

Prioritization of expenditure was on wages for staff, leaving only 30 percent to dissemination of technologies to farmers

10 MoFPED, (2014) BMAU annual monitoring report under the Ministry of Finance Planning and Economic Development- Uganda-Kampala
11 VISION 2040, PP 47, A strategic guiding document for Uganda's growth and development prospects in the next 30 years

3 Agriculture research financing challenges

Whereas the vitality of agricultural research development is globally acclaimed, funding agricultural research for development is still low in the developing economies for the most part sub Saharan Africa. For instance, average agricultural research investment as a percentage of agricultural GDP in developing countries is 0.58%, compared with 2.4% in developed economies[1]. In Uganda, whereas government efforts towards funding agricultural research have been tremendous especially through the National Agricultural Research Organization, such research infrastructure and funding for agricultural research are still inadequate to address competing demands and there is heavy dependence on donor funding which is characterized by erratic disbursement and flow[2]. Additionally, such funding has for the most part been geared towards recurrent expenditure as opposed to development expenditure. This has great implications regarding research impact on agricultural sector development and growth sustainability. Agona, etal., 2014 indicates for instance that research expenditure that goes to capital investments constitutes only 8 percent.

Whereas research funding for agricultural development has been increasing since 2000, it has been permeated by fluctuations with 1.29 percent of GDP in 2008 and 1.22 percent of GDP in 2011[3]. This level of spending as a percentage of GDP is still below the average spending for the developed world (about 12%) given that Uganda is considered an agro-based economy. Besides, Uganda's GDP growth rate has been tremendous averaging at 5.2 percent between 2010/11 and 2013/14.

only **8%**

of research expenditure goes to capital investments

1 GCARD (2010) Transforming Agricultural Research for Development (AR4D) Systems for Global Impact, World Development Report (2008), Agriculture for Development

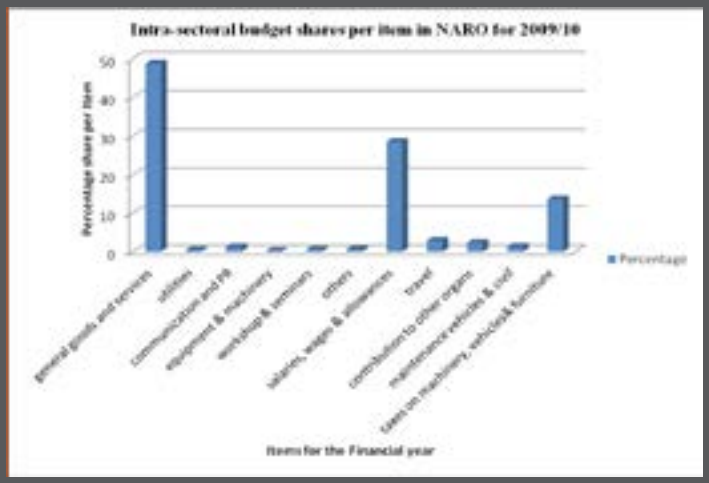
2 NARO (2008) National Agricultural Research Organization strategic plan, 2008/09 – 2016/17

NARO secretariat Box 295, Entebbe Plot 11 – 13 Lugard Avenue

3 Agona,et.al,(2014), Agriculture Research and Development Key Indicators Fact Sheet 2014. Key Indicators 2000- 2011

This justifies the need to improve funding to key areas in key sectors of the economy like agriculture. The intra-sectoral budget allocations of the little funding that goes to NARO is also skewed against research development. For instance, the 2009/2010 allocations of NARO budget reveal dismal or no allocations to direct research as the graph below indicates

Figure 1: Inter Sectoral Budget Shares per Item in NARO for 2009/10



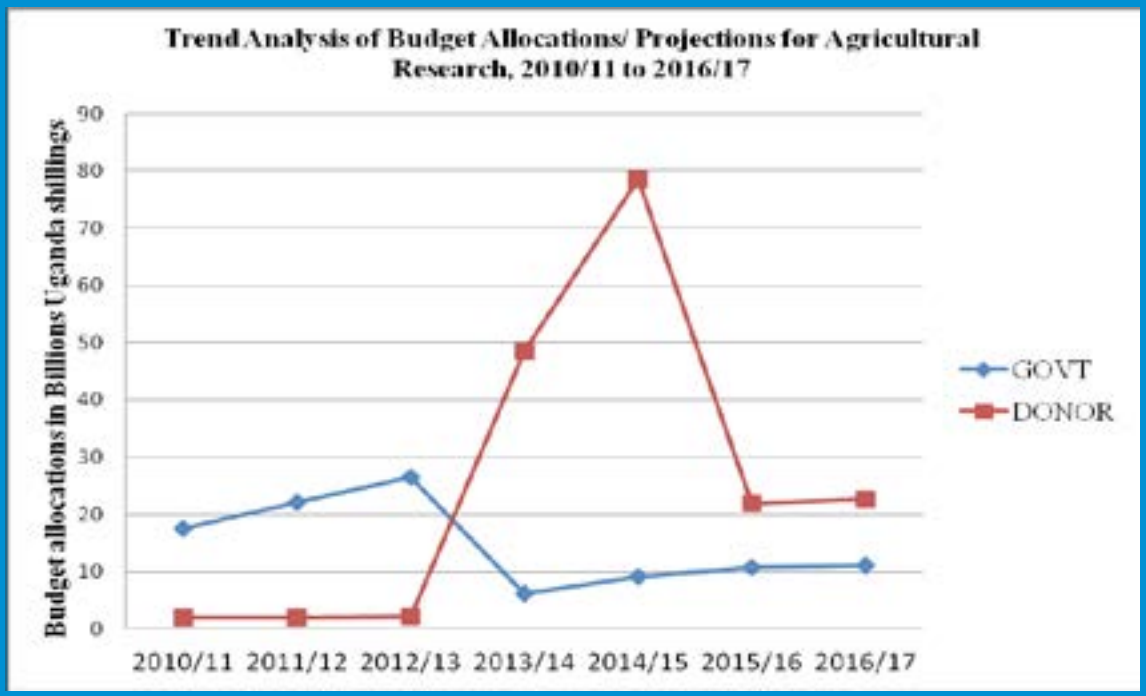
Source: Illustration based on ACODE research series No 40 (2010) budget analysis on NARO 2009/10.

The situation in Figure 1 implies not only trivial expenditure on direct research activities and its development but also probable inadequacy in the funding that goes to NARO as the leading research institution. The allocations that went mostly towards general goods and services, salaries, wages and allowances clearly shows the expenditure priorities in Uganda's agricultural research system. This budgetary allocation prioritization is not any different from what has been happening over the years including the current financial year. This is attested to by remarks of NARO's Director General yet, even the seemingly bigger (over 20%) portion that goes to staff remuneration is still inadequate compared to other government institutions. An interview with the Director General revealed a significant level of labor turn over in the institution over the past five years despite the institution spending money to

develop their capacity. This has put the scientific fabric of the research institution in jeopardy, generally affecting technology generation with time. It is difficult to reap higher development benefits from agricultural research if more funding is not geared towards direct research activities.

The most worrying situation regarding funding agricultural research in Uganda is that over the years, funding that goes to development has either been fluctuating or declining for the most part government contribution. Donor funding is perilous to rely on since both actual and projected budgetary contributions to research development indicates declining trends. Figure 2 below illustrates the trend of funding that goes to development expenditure in Uganda's agricultural research system;

Figure 2: *Trend Analysis of Budget allocation/projections for agricultural research, FY 2010/11-FY 2016/17*



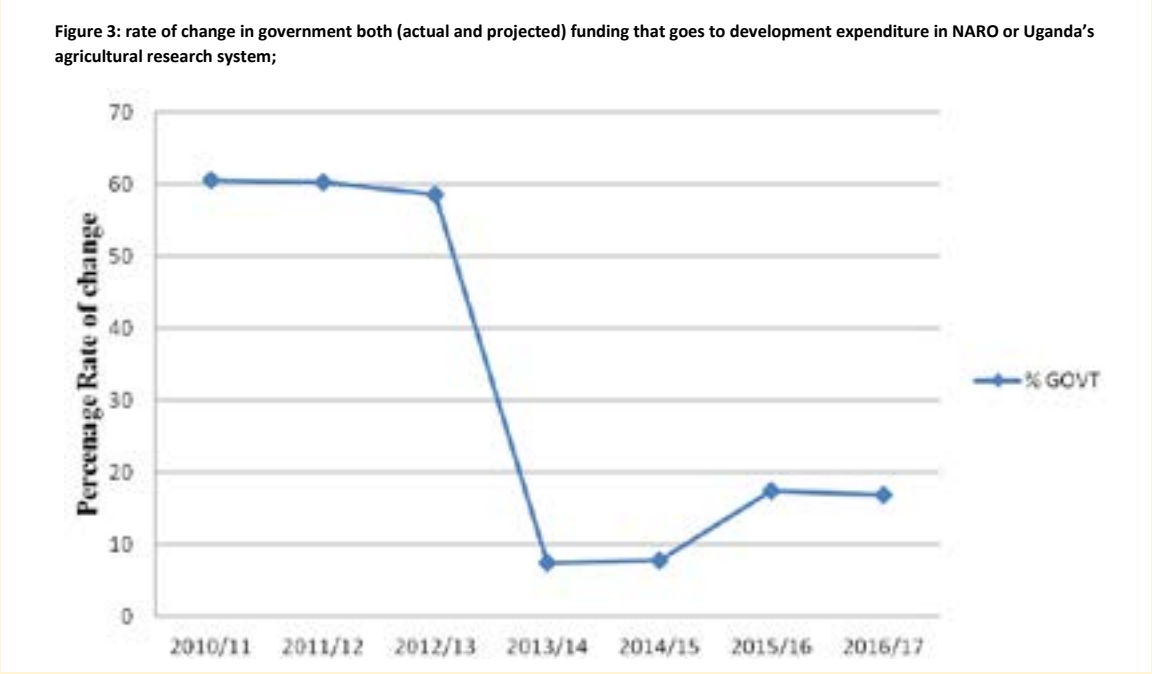
Source: *Own Illustration based on Budget Framework papers for the financial years in question*

Figure 2 indicates a declining trend in funding development expenditure in Uganda's agricultural research system as indicated by both actual and projected funding that goes to development under NARO's function vote for the financial years above. Except for financial year 2012/13, the subsequent years post drastic declines in government funding and the slight increments for 2014/15 and subsequent projections are just slightly above 10 percent. This is worsened by the sharp decline in projected support from the donor community as indicated by 2014/15 through to 2016/17. This means that without further commitment from government towards funding agricultural research especially development expenditure (where direct research activities do belong) the expected contribution of agriculture towards growth and economic development in Uganda will begin to be elusive. Without government increased funding towards the sector especially research and continued reliance on donor funding is perilous for the future. The anticipated vision (2040) of transforming Uganda from a peasant to a modern and prosperous country within 30 years will be elusive since majority of the population still and will continue to derive their livelihood from the agricultural sector.

The 2013/14 budget allocations (figure 2 foregone) from government that indicate increments, are thwarted by a close examination of the rate of increment of government funding both actual and projected that has been going (expected to go) to development expenditure in agricultural research.

Figure 3 illustrates the trend of the rate of change in government funding that goes to development expenditure in NARO or Uganda's agricultural research system;

Figure 3: Rate of change in government both (actual and projected) funding that goes to development expenditure in NARO or Uganda's agricultural research system;



Source: Own Illustration based on Budget framework papers for respective financial years

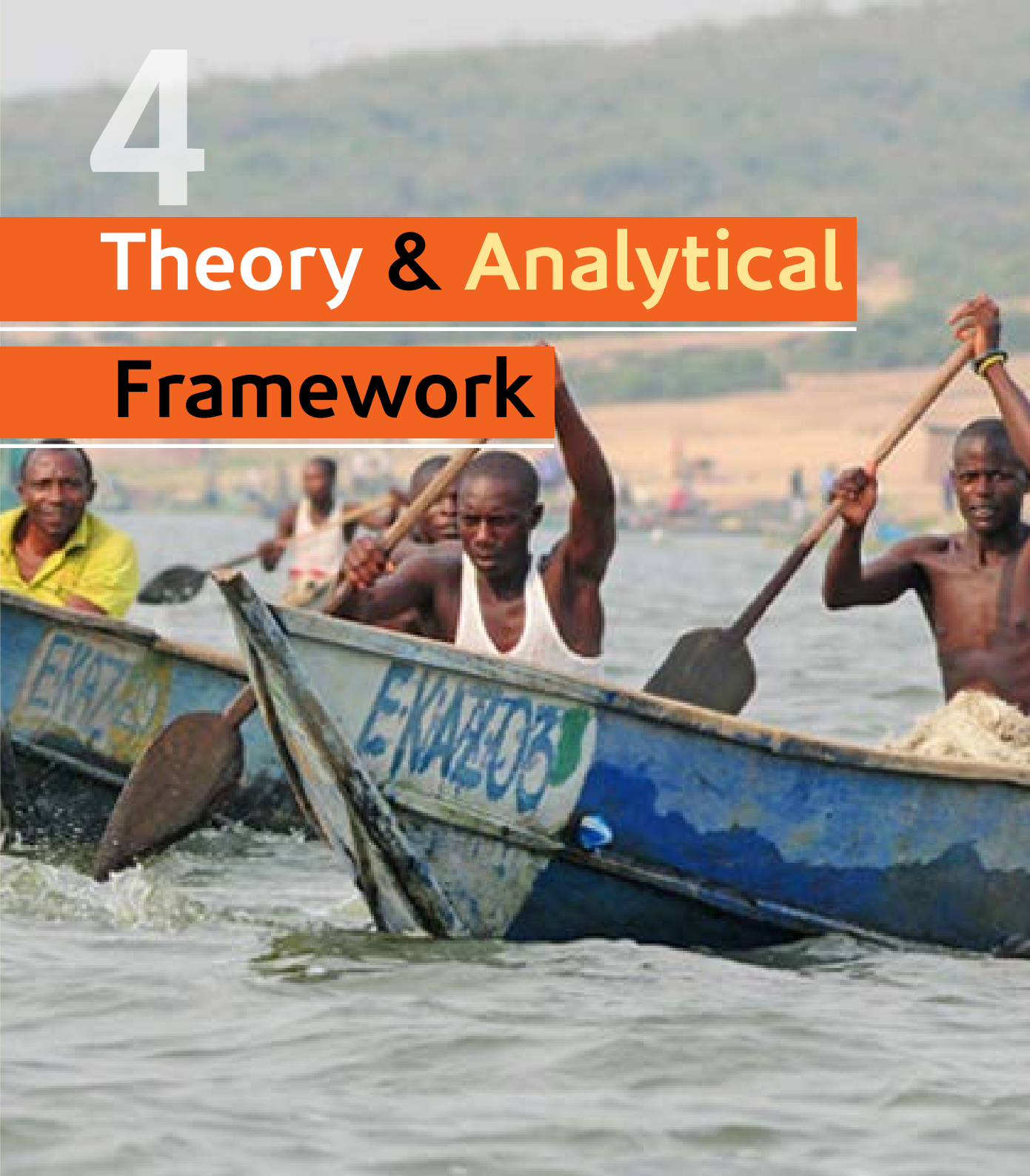
From figure 3 foregone, it is clear that the rate of increment has been declining right from 2010/11 although it sharply declined in 2013/14 with expected increment from 2014/15 indicating a rate below 20 percent. With donor funding projected to decline further, government commitment to increasing budget allocations to agricultural research is more important now than before if productivity in agriculture is to be achieved and sustained in the next thirty years.

In order to reap the benefits of important investments like agricultural research for development, extra resources should be allocated targeting increased number, variety, and intensity of actual research activities[4].

4 *Beintema and Stads (2011) African Agricultural R&D in the New Millennium: Progress for Some, Challenges for Many. IFPRI Food Policy Report. Washington, DC: International Food Policy Research Institute.*

4

Theory & Analytical Framework



Empirical studies have indicated that agricultural growth has the greatest efficacy in reducing poverty and its attendant correlates like inequality and agriculture matters more than manufacturing growth for poverty reduction[1]. In Uganda if agriculture grew at 6 percent per annum, the poverty rate would be cut by an additional 7.6 percentage points to 18.9 percent, much lower than the 26.5 percent that would be reached if agriculture continued to grow at the average rate of 2.8 percent per year[2] Empirical evidence further has it that, scientific research is one of the most important ingredients of any agricultural development strategy. Research engenders growth in agriculture and consequently poverty reduction through not only traditional pathways like employment creation but also through generation of new technologies in form of long lasting crops and livestock[3] It is one of the most critical key investment areas to spur productivity through supporting technology generation and dissemination. In Uganda, investment in agricultural R&D and extension offers the greatest potential among agricultural investment areas for enhancing productivity and reducing poverty[4].

In Uganda
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6%p.a

the poverty rate would
be cut by an additional

7.6
percentage
points

1 Lukwago (2010), Increasing Agricultural Sector Financing, "Why it Matters for Uganda's Socio-economic Transformation´. ACODE Policy Research Series, 2010

2 Benin.et, al (2007) Agricultural Growth and Investment Options for Poverty Reduction in Uganda. International Food Policy Research Institute (IFPRI), Discussion Paper 00790.

3 Hazell, et.al, (2001) Agricultural Research and Poverty Reduction. Food, Agriculture, and the Environment Discussion Paper 34 International Food Policy Research Institute 2033 K Street, N.W. Washington, D.C. 20006 U.S.A.

4 Lukwago (2010), Increasing Agricultural Sector Financing, "Why it Matters for Uganda's Socio-economic Transformation´. ACODE Policy Research Series, 2010

It has the highest return comparatively as 12 Ugandan Shillings occur in form of return for every additional shilling invested[5].

This makes public spending on agricultural research one of the most effective ways to turn around agricultural productivity in Uganda, improve people's welfare, increase export earnings for the economy and provide a springboard upon which industrial growth can rotate. The findings aforementioned regarding returns associated with agricultural research imply that it would be profitable to invest more for greater results.

Additionally, efficacy of agricultural research need not to be emphasized given its associated benefits in impacting productivity and growth in agriculture. It does not only provide information for policy makers and funding agencies but also provides transfer of research-induced technology to farmers. If taken beyond technology generation, it provides feedback to scientists on which technologies or technology components are successful at farm levels[6].

The findings aforementioned regarding returns associated with agricultural research imply that it would be profitable to invest more

12Shs
occur in form of return
for every additional shilling
invested

5 *Zhang, et.al, (2004) Public Expenditure, Growth, and Poverty Reduction in Rural Uganda. International Food Policy Research Institute (IFPRI), DSG Discussion Paper 4. Washington, DC.*

6 *Adenike, O, (2010) "the role of research in agricultural development" National Horticultural Research Institute P.M.B. 5432, Ibadan, Nigeria*

5 Sources of Funds for Agricultural Research in Uganda (NARO financing) and associated challenges

One of the major funders of NARO is government of Uganda. Government annually finances NARO's both recurrent and development expenditure budget. Recurrent budget finances stands close to 26 billion Uganda shillings per year. This is the budget support that caters for staff remuneration in NARO. Over the past few years NARO has been getting close to 100 percent of the needed funding from government, representing very low or no funding gaps as far as recurrent budget support is concerned. This is indicative of greater government commitment in this area although omissions can't still be denied. Financial year 2012/13 witnessed shortfalls in funds allocated to staff remuneration, leading to an unanticipated restriction on staff recruitment with its associated implications for research[1].

Government performance is, however, rated poorly when it comes to development expenditure budget support yet this is where actually some aspects of research activities are catered for. The budget for development stands at about 90 billion Uganda shillings but financial year 2013/14 NARO recorded a shortfall of close to 22.5 billion Ugandan shillings as it didn't receive the fourth quarter budget funds support from government. This means only 75 percent of the development expenditure budget was received. Total budget support received for both recurrent and development expenditure for the financial year 2012/13 was less by 14.39 percent, leading to flaws in overall performance of the organization during the last quarter considering both new planned and ongoing activities[2]. Apart from failing to receive support for some quarters of development budget financing, quarterly release of funds especially for development expenditure is somewhat incompatible with agricultural research activity implementation. Scientific experimentation that forms the core of the research agenda mainly responds to seasons that may not be in line with the

Total budget support received for both recurrent and development expenditure for the financial year 2012/13 was

less by **14.39%**

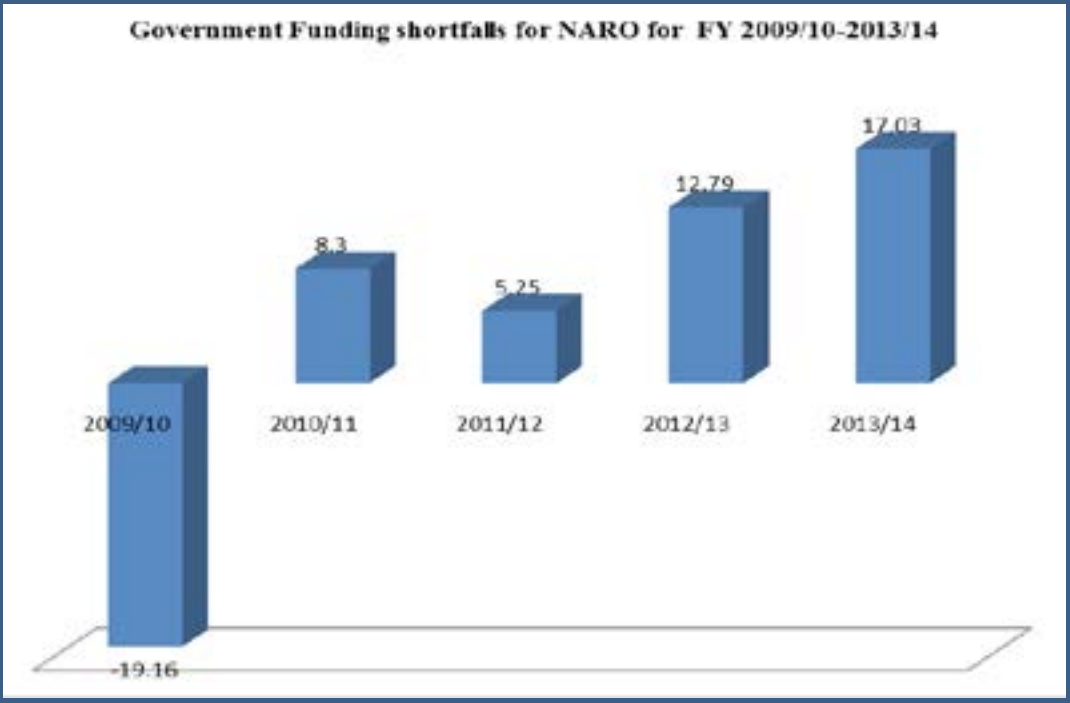
1 MoFPED, (2013), Semi-Annual Budget Performance Report, Financial Year 2012/13

2 MoFPED, (2013), Semi-Annual Budget Performance Report, Financial Year 2012/13

quarterly timelines of government. This makes challenges of timeliness and adequacy of funds being released quite glaring3.

The figure that follows illustrates generally the budgetary funding gaps that agricultural research/ NARO has been facing over sometime between 2009/10 to 2013/14. The most glaringly worrying aspect is that the gaps have been increasing over time posing serious challenges regarding sustainability.

Figure 4: Government funding shortfall for NARO FY 2009/10- FY 2013/14



Source: Own illustration based on MoFPED annual budget performance reports

Figure 4 clearly reveals that except for financial year 2009/10 where government funding went over the approved budget (negative shortfall); the subsequent years have witnessed increasing shortfalls in government funding towards NARO or the agricultural research system.

3 *Agona, A, (2014), Director General NARO in response to a Key Informant Interview, in November 2014 at NARO Head Quarters in Entebbe-Uganda*

The mere fact that the shortfalls are on an increasing trend as indicated above, the expected research outcomes and associated impact on agricultural productivity will likely remain elusive.

Moreover, besides the aforementioned funding gaps that are ever increasing, most of the funds are usually released towards the end of quarter four. For instance funds for financial year 2012/13 were mainly released in fourth quarter making it difficult to utilize, causing an unspent balance of 1.07 bn4. Additionally, financial year 2009/10 saw quarter one funds come in September instead of July, second quarter funds came in December instead of October, and there was no release for third quarter and quarter four came in came in May. All this funding untimeliness occurs amidst the available knowledge that research requires good consistent funding since it is a lengthy high input process5.

Apart from government, NARO has the provision of raising non tax revenue from the research products that are produced from the research departments and at times compensation from the use of government land under NARO's jurisdiction. Financial year 2012/13 projections were close to 5.6 million but these projections were thwarted by an unexpected shortfall of about 50 percent due to unforeseen circumstances.

The other major funding agency besides government and the nontax revenue is the International Development Association (IDA) or the International Bank for Reconstruction and Development, and the International Fund for Agricultural Development (IFAD) which currently supports the ATAAS project. ATAAS project is jointly implemented by National Agricultural Advisory Services (NAADS) and NARO. It comprises of five components where NARO concentrates on the first two and the last component of the project. These components are as follows;

Component 1 - Developing agricultural technologies and strengthening the National Agricultural Research System. The main objectives of this component are to develop agricultural technologies through research and to strengthen agricultural research institutions;

Component 2 - Enhancing partnerships between agricultural research, advisory services, and other stakeholders. This component will enhance the efficiency and effectiveness of technology development and dissemination.

4 *MoFPED, (2014) Annual Budget Performance Report for the various ministries and sectors in Uganda*
5 *Ibid*

In order to achieve these objective closer linkages between NARO, NAADS, and other relevant stakeholders in research and advisory services will be strengthened

Component 3 - Strengthening the National Agricultural Advisory Services. This component aims at supporting improved delivery of demand-driven and market-oriented advisory services to farmers to promote their progression from subsistence to market-orientation;

Component 4 - Supporting agribusiness services and market linkages. This component targets promoting integration of smallholders in value chains by supporting collaboration between agribusiness, farmers, advisers, and researchers to create viable, sustainable market and agribusiness linkages;

Component 5 - Program management. The objective of component 5 is to support the NARO and NAADS Secretariats to ensure: (i) efficient execution of administrative, financial management, and procurement functions; (ii) coordination of project activities among various stakeholders; (iii) implementation of safeguard measures mandated by the Government of Uganda and the World Bank; and (iv) an effective use of the joint M&E and ICT systems established under component 2.

ATAAS has just been reviewed and its modus operand is going to significantly change with NAADS not to play a direct role but mostly it's to be Ministry of Agriculture, Animal and Industrial Fisheries (MAAIF) and NARO. ATAAS is a $665million investment of which IDA and IFAD are meant to contribute $120 million, and the GEMF is to contribute $ 7.62 million for the component of sustainable land management while government meets the rest of the financial contribution to the project. But in the implementation process of the ATAAS project, it is factual that NARO has never received government's commitment to meeting the

ATAAS is a

$665million

investment

of which IDA and IFAD are meant to contribute

$120 million

and the GEMF is to contribute

$ 7.62 million

difference as far as funding ATAAS is concerned[6]. This makes the peril of funding predictability evident in this case. This is either worsened by or perpetuated by the limited (only 91 billion) Medium Term Expenditure Framework for NARO. Although the Medium Term Expenditure Frame work has been raised to about 155.46 billion Uganda shillings, there is no certainty regarding government's commitment over the same. This creates difficulty in planning and efficient financial resource allocation.

Finally, capacity development has also been done by NARO to enable scientists attract funding competitively on a global scale. This strategy entails the development of human resource with the skills to competitively through proposal generation compete with fellow scientists around the world for research funding. This is usually in the preferred fields by the funding organizations like Bill and Melinda Foundation, Ford Foundation, Master Card Foundation, Rock Feller Foundation among others. The most important challenge regarding this source of funding is related to retention of the skilled scientists under a tight fabric with the ability to compete for funding globally. One of the key ingredients to ensuring human resource retention is remuneration and this calls for a commensurate recurrent budget support which is still inadequate as earlier alluded to, manifest in high staff turnover due to higher demand for them.

Although the Medium Term Expenditure Frame work has been raised to about

155.46 bn

there is no certainty regarding government's commitment over the same

6 *Agona, A, (2014), Director General NARO in response to a Key Informant Interview, in November 2014 at NARO Head Quarters in Entebbe-Uganda*

6 Performance of NARO over the years

A quick glance at NARO's performance can be discerned from a close examination of the key parameters; Technology Generation, Research-extension-farmers interface, and Institutional capacity strengthening. Albeit other variables/indicators can't be omitted, these three parameters summarize the key purpose of research, how it is availed to the ultimate beneficiaries, and the human resource responsible for outputting it.

FY 2008/9- 2010/11 indicate NARO achieved

100%
of planned targets

Table 2: Planned and Actual Budget Performance for NARO, 2008/09- 2012/13

FY	TECHS (Production Technologies generated)			V-S (New varieties submitted for release)			RS-CG (Research studies under competitive grants scheme)			TI-DEL (Technological innovations delivered to uptake pathways)		TI-PLAT (Technological innovation platforms established)	
	Planned	Actual	Deviation	Planned	Actual	Deviation	Planned	Actual	Deviation	Planned	Actual	Planned	Actual
2008/09	14	14	0	25	24	1	54	48	6	36	30	NA	NA
2009/10	70	70	0	20	15	5	65	61	4	NA	NA	NA	NA
2010/11	75	75	0	25	29	(4)	66	13	53	NA	NA	NA	NA
2011/12	80	90	(10)	23	28	(5)	72	0	72	NA	NA	NA	NA
2012/13	80	90	(10)	33	28	5	60	13	47	5	10	30	15
2013/14	_												

Source: Annual Budget Performance Reports for the respective Financial Years, MoFPED

From the foregone table, it is clear that over the past four years, NARO's performance has been tremendous in terms of technology generation. It ought to be noted that this is one of the key outputs in NARO's mandate. Key performance indicators in this area are very excellent[1]. Financial years 2008/9 to 2010/11 indicate 100 percent achievement of planned targets while the last two financial years in the table indicate more than 100 percent achievement with figures in the deviation columns indicating the extra points in terms of performance.

Performance rate in terms of varieties submitted for release is not significantly different from that in production technologies generated. This is for the reason that the two move hand in hand. This is, however, only necessary but not sufficient to stimulate higher levels of productivity in the agriculture sector. The sufficient condition for impacting greatly on agricultural productivity is the transfer of such technologies and associated agronomic practices to the poor farmers who are the ultimate beneficiaries. Through this conduit, agricultural research is able to feed into the strategies laid down in the National Development Plan, VISION 2040, prosperity for All, and other policy documents of the government.

Whereas achievements in terms of research studies under competitive grants scheme are indicative of institutional capacity strengthening (it measures how competent/ competitive NARO's scientists are globally), there is still reason to worry. A close look at the deviations column reveals the fact that less is achieved compared to planned targets. This may probably be due to the turnover in the institution. It ought to be noted that this is another source of funding that is available to NARO and any shortfalls associated with it spells peril for agricultural research in the country.

1 *Agona, A, (2014), Director General NARO in response to a Key Informant Interview, in November 2014 at NARO Head Quarters in Entebbe-Uganda*

The aforementioned strides are almost thwarted by the poor performance registered in the last columns for the most part the research-extension-farmer interface. The dismal performance posted over the years in terms of technological innovations delivered to uptake pathways and technological innovation platforms established leave a lot to be desired. This means that there is a very weak research-extension-farmer nexus yet it is this end conduit that enables agricultural research outputs to impact unto agricultural productivity and raise farmers' incomes in the process. Although the current mandate dictates that NARO's technology generation should be demand driven and market oriented at the end of the day, NARO stops at breeder foundation and development of prototypes and somebody else takes over as far as dissemination is concerned[2]. This makes it hard to establish whether the farmers are taking on what is being generated by research Institutions under NARO yet this is the ultimate goal of agricultural research in any given economy. This has got negative implications for agricultural productivity and undermines the effectiveness of agricultural research in impacting on the welfare of poor sections of society.

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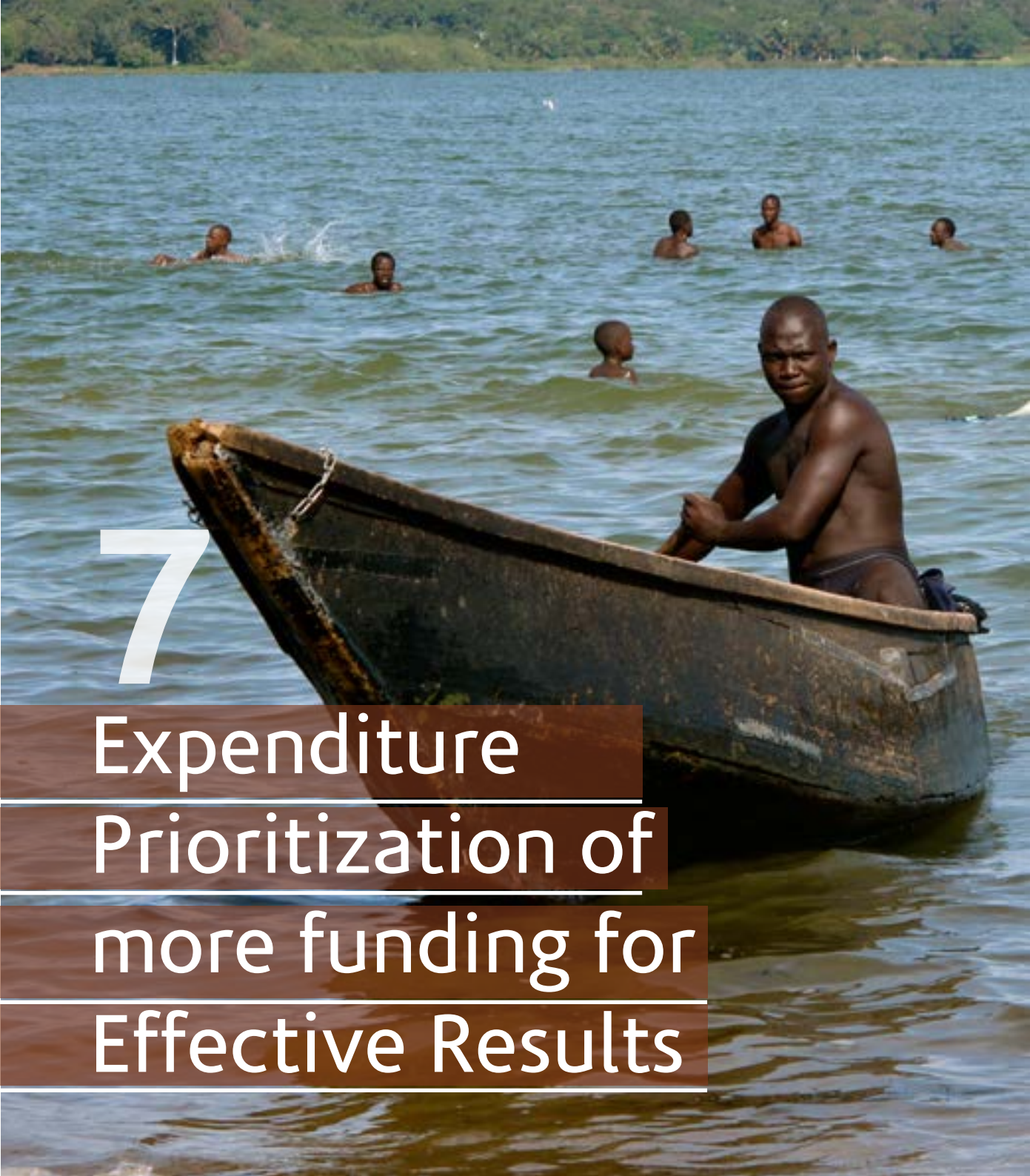

7 Expenditure Prioritization of more funding for Effective Results

In order to improve expenditure effectiveness in agricultural research in case more funding is availed, there is a need to look at what others are doing right. The area of value addition is critical at the moment although efforts have so far been done to take this direction[1]. More spending on value addition is required because this is the best way to target the market and enable farmers access the most profitable segment of the value chain. This is what Focus Group Discussions with farmers in Fort portal, Kamuli and Teso regions also emphasized implicitly when they voiced their concerns over the market issue. To such farmers, NARO has so far done a good job in generating technologies, new varieties and related aspects but so far the increased productivity has meant less as farmers grapple with marketing challenges during times of harvest. Yet these very products do suffer from storage defects and other postharvest handling demerits compared to traditional varieties.

Another area that needs consideration is that of nutriceuticals. This is what will effectively link agricultural research to society welfare since it strikes at the core of human living. Development of nutriceuticals provides the bridge between food/nutrition and human health. Increased agricultural research funding in this direction will not only impact on the agricultural sector but also avail productive labor to other sectors of the economy. Health economists have it that health and education are the surest way to develop a productive human resource base capable of turning around the growth and development prospects of any economy. Prioritization of funding towards this link will help the economy save millions that are spent on importation of food supplements especially in this era of HIV-AID scourge.

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8 Alternative policies

Funding agricultural research needs to be increased

for the most part development funding coupled with a change in expenditure prioritization. As NARO's Director General confirms, more development funding is required for the reason that this is the area that form the core agricultural research system thus where actual research activities are catered for. NARO's budget of about 90 billion needs not only to be increased but also improved in terms of predictability and timing in terms of release. Unlike research conducted in other sectors, agricultural research experiments tend to be seasonal and sometimes overlap. This makes quarterly release of funds to NARO incompatible with scientific research activities that constitute the core function of NARO. For instance, if government had not failed to release the last quarter funds of FY 2013/14 NARO would have that only 75 percent of planned experiments completed and that the overlapping experiments were completed thus minimizing the losses. The increase in funding ought to be coupled with more commitment from government and a reduction on over reliance on donor funding since it is associated with erratic disbursements. Donor support components under agricultural research have often suffered erratic release of funds for the same, making implementation difficult. For instance, most of the unreleased funds for the ATAAS and EAAPP under the NARO were donor funds.

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90 billion

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Urgent extension of NARO's mandate with the associated funding should be worked upon.

The current mandate of NARO; to undertake, promote and coordinate research for crops, livestock, fish and forestry and to ensure the dissemination and application of research results, falls short on the dissemination and application wings. Although a Key Informant Interview with NARO's director general that the current NARO mandate dictates that NARO's technology generation should be demand driven and market oriented at the end of the day, NARO stops at breeder foundation and development of prototypes

and somebody else takes over as far as dissemination is concerned. The extension arm; NAADS has tended to replace these two wings with demonstration but in less effective ways. Focus Group Discussions with farmers in Wakiso, Kamuli, Fort portal and Dokolo districts revealed that save for a few demonstrations by ineffective service providers under NAADS, farmers mainly depended on seed companies regarding the modus operand of new technologies. NARO is weak in disseminating its technology to farmers, especially small scale farmers. As of end 2006, just 55percent of NARO's research outputs had been disseminated and these had reached less than half of all crop farmers and 30 percent of livestock farmers (Lukwago, 2010). It is worth mentioning that direct involvement of NARO scientists in dissemination of what they (scientists) have generated, has got more efficacy in turning around productivity in the sector and ensuring technology performance than the current arrangement. Whereas the NARO scientists is desirous to see that his new technology yields the expected during actual farm application by farmers, the service provider under NAADS is more interested in the profit margin and will definitely use the cheapest demonstrator irrespective of competence and knowledge about the technology. There has to be more funding from government and other funding agencies towards agricultural research in Uganda. This is for the reason that extending the mandate and its consequent fulfillment calls for more recruitment of scientists which has got financial implications.

Private sector contribution to agricultural research funding is needed.

Individual nations have benefited enormously from productivity growth in agriculture, a substantial amount of which has been enabled by technological change resulting from public and private investments in agricultural research and development[1].

1 Alston, J. M. (2010), "The Benefits from Agricultural Research and Development, Innovation, and Productivity Growth", OECD Food, Agriculture and Fisheries Papers, No. 31, OECD

In Uganda farmers' participation rates in technology generation range between

5-17%

of households.

Given the benefits that private organizations get from research products of Uganda's agricultural research system especially seed companies; it is timely to bring them on board to fund agricultural research. This will be in tandem with the eighth implication of the current trends on NARO thus "the need to change the existing mindset from research as a public service to research as a business replete with the dynamism, creativity and entrepreneurial attitudes incumbent in corporate entities"[2].

An interview with the Director General of NARO indicated that whereas NARO is at the helm of technology generation in Uganda's agriculture sector (as its mandate states), dissemination of developed technologies to the ultimate beneficiaries is undertaken by different organizations. These organizations are for the most part private whose motivation to appropriately and timely disseminate research technologies to farmers is profit. This represents the immediate gain these organizations get from NARO's research outputs but not commensurately paid for by these organizations. Focus Group Discussions with farmers in Kamuli, Fort portal and Dokolo districts revealed farmers' ignorance regarding who exactly develops the new crop varieties they use currently. Economists would in this case have it that famers ignorance increases demand inelasticity and gives leverage to the private organizations in determination of technology prices and the associated profits. Therefore, policy change to bring these private organizations on board in terms of funding agricultural research in Uganda is long overdue. Whereas NARO is a public Institution, the private sector as an intermediate beneficiary of developed technologies ought to be compelled to partly finance technology generation in the agriculture sector. This will ensure that originality of the disseminated technologies is maintained as it increases public (NARO) private ownership of the same. This should, however, be accompanied with appropriate pricing policies for the technologies to avoid price hikes arising out of private contribution to agricultural research and consequently the technologies generated. As a farmer in Fort portal reiterated, "seed companies always want us to buy seeds from them even when we store part of our harvest in preparation for the next planting season which is quite disturbing and expensive".

Publishing. http://dx.doi.org/10.1787/5km91nfsnkwg-en

2 NARO (2008) National Agricultural Research Organization strategic plan, 2008/09 – 2016/17 NARO secretariat Box 295, Entebbe Plot 11 – 13 Lugard Avenue

There is need to discard the current linear agricultural research and innovation system. Rather than starting from a technology and its potential promise, transforming agricultural research for development requires thinking based on delivering the outcomes desired by and for the poor and how knowledge generation, access and use can help lead to these. This will be in tandem with one of the focal points of NARO's strategic plan 2008/9-2017/18 thus; development and implementation of a client and impact-oriented, market-responsive agricultural sector research agenda. Previous studies on agricultural research in Uganda indicate that for instance that farmers' participation in the processes of technology generation is minimal, with participation rates of 5-17% of households (Oxford policy Management, 2005) which is quite dismal for demand driven technology generation to be ensured.

Policy change to ensure elimination of the current linearity will act to strengthen the weak research technology- market- farmer nexus that impedes effectiveness of technology generation in engendering increased agricultural productivity. As farmers in Kamuli district noted, current research in agriculture ought to focus on remedying the defects of the already existing new breeds especially in crop husbandry other than coming up with other varieties. A farmer in Wankole Sub County strongly contends that the new varieties developed by NARO are compatible with the current seasonal changes but fall short on critical features pertaining storage, taste, and generally post-harvest handling. Difficulties in storage force famers to quickly sell the yields irrespective of the prevailing prices.

Because of external price determination that permeates the agricultural sector, such adopted technologies therefore, end up not benefiting the farmers as expected by NARO and other research Institutions.

Evaluation of the above alternative policies

The alternative policy options above were evaluated qualitatively based on the political and technical criteria. The former was selected because government as the prime source of financing is critical and the former obviously represents the ability of the policy alternative to surmount the problem at hand. The tabulation below reveals it all;

Table 3: Evaluation of policy options based on political and technical criteria

Policy/Criteria	Effectiveness	Adequacy	Acceptability	Appropriateness	Equity	Legality
Increasing Financing	5	3	4	5	4	5
Private sector participation	5	4	5	5	3	5
Extension of NARO's mandate	0	2	4	5	0	5
Discarding the current linear arrangement	0	0	4	5	4	4

Source: Own illustration based on CSBAG's criteria

A liker's scale of 0-5 was used to evaluate the policy options foregone with 0 being the worst and 5 representing the best performing alternative on the respective criterion.

From the table above, increasing financing coupled with private sector participation stand out to be the most appropriate policy alternatives. The first four criteria are majorly political while the rest are technical in nature.

Transforming agricultural research for development requires thinking based on delivering the outcomes desired by and for the poor

Conclusion:

Based on this analysis, CSBAG recommends that financing that goes to agricultural research should be increased. This should mainly be from the side of government as donor funding is more prone to uncertainties. Private sector participation in funding agricultural research should also be emphasized in order to lessen the burden on government.

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