

# Vote:142 National Agricultural Research Organisation

## VI: Vote Overview

### (i) Snapshot of Medium Term Budget Allocations

Table V1.1: Overview of Vote Expenditures

Billion Uganda Shillings	FY2016/17 Outturn	FY2017/18		FY2018/19 Proposed Budget	MTEF Budget Projections			
		Approved Budget	Spent by End Sep		2019/20	2020/21	2021/22	2022/23
Recurrent Wage	22.472	22.472	5.605	22.472	24.719	25.955	27.253	28.616
Non Wage	6.922	7.311	1.667	7.311	8.920	10.258	12.310	14.772
Devt. GoU	5.983	8.780	0.283	33.780	41.212	49.455	49.455	49.455
Ext. Fin.	50.588	45.540	18.861	0.000	0.000	0.000	0.000	0.000
<b>GoU Total</b>	<b>35.376</b>	<b>38.564</b>	<b>7.554</b>	<b>63.564</b>	<b>74.852</b>	<b>85.668</b>	<b>89.017</b>	<b>92.842</b>
<b>Total GoU+Ext Fin (MTEF)</b>	<b>85.964</b>	<b>84.104</b>	<b>26.415</b>	<b>63.564</b>	<b>74.852</b>	<b>85.668</b>	<b>89.017</b>	<b>92.842</b>
<i>A.I.A Total</i>	2.995	5.792	1.451	7.146	7.175	7.189	7.548	7.737
<b>Grand Total</b>	<b>88.959</b>	<b>89.896</b>	<b>27.866</b>	<b>70.710</b>	<b>82.027</b>	<b>92.857</b>	<b>96.565</b>	<b>100.579</b>

### (ii) Vote Strategic Objective

- Client and impact-oriented, market responsive agricultural sector research agenda developed and implemented
- Capacity and efficiency of public and private agricultural sector research service provider teams to respond to client needs and market opportunities improved.
- Infrastructural and financial sustainability capacities to support and facilitate agricultural research enhanced and strengthened
- Mechanisms for contributing to agricultural research sector policy formulation and development strengthened.
- Quality assurance procedures in the NARS established and implemented.

## V2: Past Vote Performance and Medium Term Plans

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## Performance for Previous Year FY 2016/17

NARO achieved the following under the vote function of generation of agricultural technologies:

- 36 new varieties/ prototypes submitted to Variety Release Committee for release
- 64 production technologies generated
- 47 research studies under competitive grants scheme

NARO achieved the following under the vote function of Research extension interface promoted and strengthened:

- 8 technological innovation platforms established/supported.
- 15 of technological innovations delivered to uptake pathways.

### Detailed achievements in Livestock research

- Two anti-tick vaccine molecules have been confirmed to effectively control blue ear ticks (*Boophilus decoloratus*) and found to be efficacious. In complement, three drugs for control of internal (Nematode, Cestode and Trematode worms) and external parasites in ruminants were evaluated with highly promising results. Two diagnostic kits for detection of Foot and Mouth Disease (FMD) and African Swine Fever (ASF) were developed. Two bio-acaricide formulations were developed and evaluated to manage the emerging challenge of tick resistance to available acaricides. A national tick distribution map, to guide tick control programs and initiatives was produced.

NARO has conducted initiatives to increase the availability of forages and feed.

- NARO has developed, evaluated and availed to farmers a milk enhancing ration, with the potential to increase milk production from local animals by 30%. One (1) milk enhancing ration based on sorghum stover and *Tithonia*.

- NARO piloted the rehabilitation and restoration of at least 42 ha of unproductive and degraded grazing land to enhance nutritive and palatable pastures in the central cattle corridor. This has contributed to increased pasture availability from 0 - 4t/ha.

- Two management techniques for optimal biomass production and conservation for four (4) fodder species (*C. calothyrsus*, *M. alba*, *V. amygdalina* and *Brachiaria* spp) were developed.

- one productivity enhancing alfafa broiler feed ration comprising of 1% NARO aflatoxin binder that reduces aflatoxin induced mortality by 445% from 6% to 1.1%, improves mature weight of broiler birds by over 12 %, and boosts bird's immunity through enhancement of Newcastle Disease anti-body concentration in blood from 4.75 to 7.91, was successfully developed.

- In livestock, 5.5 tons of milk enhancing dairy pellets produced and availed to farmers. 45 smallholder dairy farmers (18 females and 27 males) engaged in 1day forage exposure visit in Mbale.

### Detailed achievements in Fisheries research

Efforts were made on improving performance of strains of Nile tilapia and the African Catfish on 16 selected lines in Lake Albert Victoria Crescent and Kyoga Lakes. Assessment of commercial fish stocks and determination of appropriate harvesting technologies was done. Nile perch (mostly dominated by juveniles) constituted the largest biomass (> 70%) in the shallow areas of Lake Victoria.

The total lake biomass on the Ugandan portion of Lake Victoria in two pelagic species Nile perch and Mukene reduced from 0.88 million tonnes to 0.74 million tonnes between 2015 and 2016. A total of 55 fish breeding and nursery areas were identified, characterized and mapped for protection. A draft policy brief for management of fish breeding areas. An assessment of the Efficiency of Mukene fishing rig were improved and performance of floating and submerged light attraction technologies for Mukene harvest evaluated, with the submerged registering higher catch rates.

- Optimum cage stocking density of African catfish and Nile tilapia on Lake Albert was determined.

## Performance as of BFP FY 2017/18 (Performance as of BFP)

AT BFP NARO has achieved the following under the vote function of generation of agricultural technologies:

1. 8 new varieties/ prototypes submitted to Variety Release Committee for release
2. 25 production technologies generated
3. 47 research studies under competitive grants scheme

NARO has planned to achieve the following under the vote function of Research extension interface promoted and strengthened:

- 5 technological innovation platforms established/supported.
- 30 of technological innovations delivered to uptake pathways.

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## Detailed achievements in Crops

- Productivity and profitability of 3 small gardening technologies for urban farming of tomatoes and nakati were investigated.
- Conducted a consultative meeting and a field survey BCTB and BBW assessment was conducted in Kayunga, Nakaseke & Masaka districts, as a follow up on the previous training conducted.
- 45 farmer households in Kayunga, Nakaseke and Masaka were given on spot training on how to manage the BBW and BCTB
- Pest data from Tea farms in Kabarole district collected indicated that Red spider mites had higher severity of over 60% on clone 303/577 followed by 108/82. Clone 31/8 had least attack of 14%. Tea thrips had the highest incidence of 80%, also on clone 303/577 followed by 108/82.
- Information on pests' incidence and severity collected in tea growing regions. Chloropyrifos treatment has shown reduction in pest damage from 30%-14%, followed by neem leaf extract (25%-14%) . Pest damage was high (40%) in the control.
- 22 clones were evaluated on station using NPK 25:5: 5 2. Nine months after fertilizer application clone 303/577 and 108/82 increased yields to 1.4 and 0.98 kg per bush respectively.
- Decision making tool for management of cowpea scab disease developed and to be pre-tested.
- 3 Citrus management demonstrations have been established in Kamuli and Kayunga
- 5 demonstration for NAROBAN varieties established in NaCRRRI, Kabale, Rwebitaba, Bulegni and Nakabango
- ARIBA Coffee Farmers' group with 3,000 membership fully functional in Amuru district;
- A Coffee Management Season Calendar has been developed and validated for the mid-western (Toro and Bunyoro) coffee agroecology.
- FFS sessions were conducted in Kimbowa United FFS in 3 districts.
- Completed harvesting of sweet potato trials in Mayuge, Luuka, Kamuli and Namutumba Districts. Naspot 8 was the farmers' most favourite variety in all locations.
- Established agronomic practices for maize in the LACZ sub agro ecologies.
- Established It is most profitable to grow Longe 10H, Bazooka, 6H and 11H in Mid-altitude AEA. It also most profitable to grow WE 3109 in the drier Semi-arid AEA and Bazooka in the Tropical Rain forest AEA of LACZ.
- Established soil amendments for citrus.
- Socio economic survey conducted in Ntoroko district plus some farmers in selected sub counties in Kabarole district.
- Survey of pests and diseases done in Ntoroko. Pests found included Banana weevils with prevalence 10% and severity of 5.4%. BBW disease incidence was 7% and severity 4.4%. Fusarium wilt disease incidence was 6.5% and severity 3.4%. Sigatoka disease incidence was 20% and severity 10%.

## Detailed achievements in Irrigation

- Two ram pumps connected in parallel for pumping 10 m3 into a raised tank, performance evaluation on drip irrigation of Irish potatoes on-going at Mirongo village Nyantaboma parish, Kabarole district;

## Detailed achievements in Energy

- First prototype of improved biomass briquetting machine evaluated.

## Detailed achievements in appropriate technology

- 5-row animal-drawn planter prototype for maize and beans was evaluated.
- Prototype power tiller or Single Axle Tractor (SAT) planter and weeder evaluated.
- The 2m and 3m width maize venturi-cribs structures were improved

## Detailed achievements in markets

- Evaluated linkages between farmers and traders in central Uganda.

## Detailed achievements in Biocontrol

- Abundance and dispersal of Glycaspis brimblecombei and its biological control agent (Psyllaephagus bliteus) in the 2 biological agent release sites (Kikinjaagi ward, Ocomai Village) and 1 control/non-biological release site in Soroti district were monitored and documented
- Suitable release sites for Selictrodes neseri established in Soroti district, for Cleruchoidesi nockae and Psyllaephagus bliteus, in Kabarole district were found suitable for release.
- Established that most lucrative marketing channels for key agricultural products in Sebei subzone.

## Detailed achievements in Forests and Trees

- Draft technical report about factors influencing adoption of reducing emissions from deforestation and forest degradation.
- Determined the profitability of clonal eucalyptus under 2 management objectives.
- Established that Investment in bamboo for culms (poles) is profitable based on a positive Present Value
- 15 biomass energy saving stoves developed.
- A draft technical report produced and stakeholders' policy issues concerning carbon trade in Uganda identified and documented

## Detailed achievements in Livestock

- Optimized color and wavelength for Ngu-B2 trap for enhanced tsetse fly capture efficiency.
- 2 EPF Bio-acaricide formulations evaluated.
- Evaluated and optimized dosages of: acaricide NH01 methanol extract against Ripicephalus Appendiculatus larvae at concs. (30, 60 & 120mg/ml) on calves-in-vivo. NH-A anti-helmitic drug against mixed nematodes in goats- Conc. of 900mg/ml causes 100% mortality after 21 days of administration and comparable to Ivermectin.
- Efficacy of 4 acaricide molecules against blue ticks generated;
- Growth performance evaluation studies done; Mean live weight of bulls supplemented with diets containing 9, 11 and 13% Crude protein was 142, 162 and 169kg respectively, all of which was significantly different from 120 kg for the non-supplemented bulls

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maintained on grazing alone.

- Protein and press cake extracted from Alfalfa, and Napier grass. Nutritional profiles of extracted protein and press cakes determined.
- Three anti-tick vaccines were found 80% efficacious on the larvae, nymphs and adult stages of the three important ticks-Brown ear tick, Bont-legged tick and Blue tick.
- A trial established to compare the effectiveness of different queen rearing methods. Preliminary data shows that cup kit is the best performing method.
- Field surveys conducted in one district in the SWZ. 300 samples on farms with abortions collected. 28% of the 157 samples analyzed are positive with brucellosis.
- Four diets of 35% crude protein developed with 0%,30%,40% and 50% yeast. Analysis of their proximate composition showed that they can provide the minimum requirements for normal growth of catfish fry. On-farm trial hosts identified.
- Inventory of important bee forages conducted in kasese district.

## FY 2018/19 Planned Outputs

NARO has planned to achieve the following under the vote function of generation of agricultural technologies:

- 20 new varieties/ prototypes submitted to Variety Release Committee for release.
- 70 production technologies generated.
- 20 research studies under competitive grants scheme.

NARO has planned to achieve the following under the vote function of Research extension interface promoted and strengthened:

- 20 technological innovation platforms established/supported.
- 80 of technological innovations delivered to uptake pathways.

## Medium Term Plans

- Understanding of farming systems in the different AEZs and establishing the extent to which previously released and adopted technologies have improved the farming systems and impacted people's lives.
- Development of new or improvement of existing technologies with increased resilience to biotic and abiotic constraints.
- Increased focus on bio/fortification through development of crop varieties with enhanced nutrition.
- Development of durable technologies to boost production and productivity in different environments.
- Improvement of pest and disease surveillance through development of integrated options including but not limited to use of computerized early warning systems.
- Improvement of pathogen diagnostic capacity through development of NAROs laboratory capacity.
- Urgently respond to the FAW by understanding its distribution, genetic diversity, effect on yield, response to selected pesticides, host plant resistance, developing a surveillance strategy and exploring bio-control strategies.
- Development of more up-to-date and relevant Integrated Pest/Disease Management (IPDM) packages for the control of old and new pests and diseases.
- Develop agro-engineering technologies that reduce drudgery, save power and increase productivity for resource poor farmers.
- Increase the development and dissemination of sustainable land management (SLM) technologies and interventions for increased productivity.
- Increase density and coverage of adaptive trials and demos for an increased promotion and diffusion of NARO technologies.
- Develop capacity of NARO PARIs in production of early generation seed and conducting core field based research through installing of irrigation systems to enable all year round seed production and field trials.
- Develop the capacity of NARO in seed postharvest handling through establishment of a seed processing facility.
- Further development of NAROs research capacity in human resources and infrastructure.
- Research leadership in gender and youth responsiveness to boost productivity while at the same time creating employment.
- Responding to increasing political demand for tighter connections between agricultural research and industries.
- Exploiting the potential of the youth and women as a trigger for accelerated agricultural research for people impact.

## Efficiency of Vote Budget Allocations

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These are statutory obligations. Contract staff salaries and related costs are totaling to Ugx 26.56 bn. This constitutes 42% of the MTEF. If these funds are not availed, there will be a high staff turn over, especially scientists, which could lead to less and poor improved agricultural technologies generated.

NARO is investing in agricultural research infrastructure (Offices, laboratories). This totals to Ugx. 8.83bn constituting 13.9% of the the year's MTEF. These include civil works in Maruzi for livestock research facilities, Nakyasasa NaLIRRI for vaccine production, NARL (Biotechnology and Plant genetic), Civil works in Nabuin ZARDI, Civil works in Kiige (NaCRRRI) for all year around fruit seedling production, rehabilitation of the guest house at NaFORRI, Rehabilitation of residential houses at Bulindi, Rehabilitation/Installation of solar power at the Plant Genetic resources Laboratory, and remodeling of existing infrastructure at Rwebitaba ZARDI and NaSARRI. All these will contribute directly to improved capacity for agricultural research for increased production and productivity through improved technology generation.

The Government of Uganda through NARO is contributing to International Organization in the agricultural domain and autonomous institutions in the NARs . This is GOU obligation to contribute to international organizations. This constitutes 2% of the years' MTEF.

### **Vote Investment Plans**

NARO has considered to undertake the following capital investments;

1. Relocation of NALIRRI to pave way for industrial development by Guangzhou Dongsong Energy Group
2. NARO veterinary research and vaccine production facility
3. Improvement in NASARRI'S AND RWEBITABA ZARDI'S infrastructure to enhance research on semi-arid crops and tea, respectively.
4. Transforming the livestock sub-sector in Uganda Through agribusiness incubation
5. Civil works in NARL (Biotechnology and Plant genetic)
6. Civil works in Nabuin ZARDI, to provide for staff accommodation
7. Civil works in Kiige (NaCRRRI), to establish the fruit seedling platform.
8. Rehabilitation of the guest house at NaFORRI
9. Rehabilitation of residential houses at Bulindi ZARDI
10. Rehabilitation/Installation of solar power at the Plant Genetic resources Laboratory

### **Major Expenditure Allocations in the Vote for FY 2018/19**

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## Major expenditure Allocation by Vote function output under GOU Recurrent expenditure:

1. Agricultural research capacity strengthened (Contract staff salaries (bn22.472), Social Security Contributions, and administrative costs (bn27.927)
2. Generation of agricultural technologies(bn 0.200)

## Major expenditure Allocation by Vote function output under GOU Development expenditure:

015151-Contributions to International Organisations: Government of Uganda contribution to sub-regional and global research laboratories to strengthen local laboratory capacity.(bn 0.78)

015101-Generation of agricultural technologies : Improved genetics and varieties /breeds for increased productivity and resilience to climatic change, pests and disease control technologies, highly nutritious crop varieties and animal best products, technologies for reduced drudgery at farm level, and product development and diversification (bn 4.028)

015172- Non-Residential Buildings(laboratories and administration blocks at Maruzi-NaLIRRI, vaccine and drug production facility at Nakyesasa-NaLIRRI, rebuilding infrastructure at Rwebitaba and NaSARRI, completing the food processing laboratory at NARL, fruit seedling platform at Kiige, solar power stabilizers at the plant genetic resources center, Entebbe) (bn 8.83).

0151076- Purchase of Office and ICT Equipment, including Software: assorted ICT equipment for data capture, analysis, storage and real time time decision making to support effective research for impact (bn 1.282).

015175- Transport Equipment: Procurement of motor vehicles for coordination, management and production of veterinary vaccines and drugs at Nakyesasa-NaLIRRI, and initial civil works activities at Maruzi-NaLIRRI (bn1.46).

015177-Machinery & Equipment: The wheel loader and grader for land opening and civil works at various research institutes (bn 4.29).

015102-Research Extension Interface Promoted and Strengthened (bn 3.373)

015104- Agricultural Research Capacity Strengthened (bn 9.485)

## V3: PROGRAMME OUTCOMES, OUTCOME INDICATORS AND PROPOSED BUDGET ALLOCATION

**Table V3.1: Programme Outcome and Outcome Indicators**

<b>Vote Controller :</b>							
<b>Programme :</b>	<b>51 Agricultural Research</b>						
<b>Programme Objective :</b>	1. Develop and disseminate appropriate technologies, knowledge and information that meet client needs and respond to market opportunities; 2. Develop the human and infrastructural capacity of National Agricultural Research System constituents to meet the dynamics of the demand for research products and services; 3. Empower and enhance participation of stakeholders in agricultural research demand articulation, output delivery and governance.						
<b>Responsible Officer:</b>	Director General						
<b>Programme Outcome:</b>	<b>Increased production and productivity of priority and strategic commodities</b>						
<i>Sector Outcomes contributed to by the Programme Outcome</i>							
<b>1. Increased production and productivity of priority and strategic commodities</b>							
<b>Programme Performance Indicators (Output)</b>	<b>Performance Targets</b>						
	<b>2016/17 Actual</b>	<b>2017/18 Target</b>	<b>Base year</b>	<b>Baseline</b>	<b>2018/19 Target</b>	<b>2019/20 Target</b>	<b>2020/21 Target</b>

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• Increased production and productivity at some level resulting from utilization of improved technologies	0	0.05%	1.2%	1.5%	1.7%
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**Table V3.2: Past Expenditure Outturns and Medium Term Projections by Programme**

Billion Uganda shillings	2016/17	2017/18		2018-19	MTEF Budget Projections			
	Outturn	Approved Budget	Spent By End Q1	Proposed Budget	2019-20	2020-21	2021-22	2022-23
<b>Vote :142 National Agricultural Research Organisation</b>								
51 Agricultural Research	83.965	84.104	26.183	63.564	74.852	85.668	89.017	92.842
<b>Total for the Vote</b>	<b>83.965</b>	<b>84.104</b>	<b>26.183</b>	<b>63.564</b>	<b>74.852</b>	<b>85.668</b>	<b>89.017</b>	<b>92.842</b>

## V4: SUBPROGRAMME PAST EXPENDITURE OUTTURNS AND PROPOSED BUDGET ALLOCATIONS

**Table V4.1: Past Expenditure Outturns and Medium Term Projections by SubProgramme**

Billion Uganda shillings	2016/17	FY 2017/18		2018-19	Medium Term Projections			
	Outturn	Approved Budget	Spent By End Sep	Proposed Budget	2019-20	2020-21	2021-22	2022-23
<i>Programme: 51 Agricultural Research</i>								
01 Headquarters	27.791	28.266	6.917	28.259	32.063	34.290	37.640	41.092
0382 Support for NARO	5.444	8.780	0.283	33.780	41.212	49.455	49.455	49.455
07 National Crops Resources Research Institute	0.113	0.092	0.015	0.094	0.096	0.120	0.120	0.155
08 National Fisheries Resources Research Institute	0.080	0.096	0.012	0.094	0.098	0.115	0.115	0.145
09 National Forestry Resources Research Institute	0.082	0.094	0.015	0.080	0.084	0.115	0.115	0.145
10 National Livestock Resources Research	0.104	0.099	0.014	0.094	0.098	0.115	0.115	0.145
11 National Semi arid Resources Research	0.080	0.099	0.014	0.080	0.084	0.115	0.115	0.145
1139 ATAAS (Grant) EU, WB and DANIDA Funded	49.894	45.540	18.776	0.000	0.000	0.000	0.000	0.000
12 National Laboratories Research	0.127	0.110	0.018	0.108	0.110	0.120	0.120	0.155
13 Abi ZARDI	0.053	0.090	0.013	0.080	0.083	0.112	0.112	0.140
14 Bulindi ZARDI	0.063	0.078	0.011	0.080	0.083	0.112	0.112	0.140
15 Kachwekano ZARDI	0.062	0.090	0.012	0.094	0.097	0.112	0.112	0.140
16 Mukono ZARDI	0.068	0.082	0.011	0.094	0.097	0.112	0.112	0.140
17 Ngetta ZARDI	0.064	0.094	0.012	0.094	0.097	0.112	0.112	0.140
18 Nabium ZARDI	0.068	0.081	0.012	0.080	0.083	0.112	0.112	0.140
19 Mbarara ZARDI	0.056	0.090	0.011	0.080	0.083	0.112	0.112	0.140
20 Buginyaya ZARDI	0.041	0.094	0.012	0.108	0.111	0.112	0.112	0.140
21 Rwebitaba ZARDI	0.061	0.093	0.013	0.094	0.097	0.112	0.112	0.140
26 NARO Internal Audit	0.059	0.050	0.000	0.080	0.080	0.100	0.100	0.000
27 National Coffee Research Institute	0.094	0.086	0.013	0.094	0.098	0.115	0.115	0.145
<b>Total For the Programme : 51</b>	<b>84.403</b>	<b>84.104</b>	<b>26.183</b>	<b>63.564</b>	<b>74.852</b>	<b>85.668</b>	<b>89.017</b>	<b>92.842</b>
<b>Total for the Vote :142</b>	<b>84.403</b>	<b>84.104</b>	<b>26.183</b>	<b>63.564</b>	<b>74.852</b>	<b>85.668</b>	<b>89.017</b>	<b>92.842</b>

**Table V4.2: Key Changes in Vote Resource Allocation**

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Major changes in resource allocation over and above the previous financial year	Justification for proposed Changes in Expenditure and Outputs
<b>Vote :142 National Agricultural Research Organisation</b>	
<i>Programme : 51 National Agricultural Research Organisation</i>	
<b>Output: 01 Generation of agricultural technologies</b>	
Change in Allocation (US\$ Bn) : (11.176)	The only External Donor Project (ATAAS) is ending in 2017/18
<b>Output: 02 Research extension interface promoted and strengthened</b>	
Change in Allocation (US\$ Bn) : (5.977)	The only External Donor Project (ATAAS) is ending in 2017/18
<b>Output: 03 Internal Audit</b>	
Change in Allocation (US\$ Bn) : 0.030	The enhanced budget for Internal audit department is to ensure increased value for money
<b>Output: 05 Generation of technologies for priority commodities</b>	
Change in Allocation (US\$ Bn) : (6.253)	The only External Donor Project (ATAAS) is ending in 2017/18
<b>Output: 51 Payments to International Organisations (CGIAR, ASARECA, WARDA)</b>	
Change in Allocation (US\$ Bn) : (1.000)	The reduction has been occasioned by the revised terms and conditions of partnership with CG centers
<b>Output: 72 Government Buildings and Administrative Infrastructure</b>	
Change in Allocation (US\$ Bn) : 5.730	Design and initial construction works for the livestock research facilities at Maruzi, Veterinary Research and Vaccine production facility at Nakyesasa, rebuilding existing infrastructure at Rwebitaba ZARDI for tea research and NaSARRI for semi- Arid crop
<b>Output: 75 Purchase of Motor Vehicles and Other Transport Equipment</b>	
Change in Allocation (US\$ Bn) : 1.110	Transportation at the new Livestock institute situated in Maruzi, Apac district. And, for day to day operation during establishment of the vaccine facility. Therefore, two and one vehicles are planned for Maruzi and Vaccine facility respectively
<b>Output: 76 Purchase of Office and ICT Equipment, including Software</b>	
Change in Allocation (US\$ Bn) : 0.332	The increment is to hasten ICT integration in agricultural research for real time decision making
<b>Output: 77 Purchase of Specialised Machinery &amp; Equipment</b>	
Change in Allocation (US\$ Bn) : (5.954)	The only External Donor Project (ATAAS) is ending in 2017/18

**Table V4.3: Major Capital Investment (Capital Purchases outputs over 0.5Billion)**

FY 2017/18		FY 2018/19
Appr. Budget and Planned Outputs	Expenditures and Achievements by end Sep	Proposed Budget and Planned Outputs
<b>Vote 142 National Agricultural Research Organisation</b>		



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Programme : 51 Agricultural Research

Project : 0382 Support for NARO

## Output: 72 Government Buildings and Administrative Infrastructure

Enhance coffee research operational at NACORI	? Procurement for Supply and	Fully functional offices and farm	
Enhance research operational at Rwebitaba	Installation of Bioreactors under	infrastructure at Kiige.	
ZARDI	National Coffee Research Institute-	Fully functional plant genetic resources	
Enhanced office and laboratory space at NARL	Kituuza was implemented.	Lab.	
Enhanced power supply for lighting and office	Evaluation Report approved by	Functional Biotechnology and Food and	
equipment	Contracts committee, Best	Agribusiness laboratories at National	
Functional and operational NALIRRI	Evaluated Bid Notice published,	Agricultural Research Laboratories	
	Contract cleared by Solicitor	(NARL).	
	General and signed with M/S	Habitable staff accomodation	
	Premier (U) Ltd. (Funding from	Habitable accommodation for guests.	
	UCDA).	Habitable accommodation for staff.	
		Infrastructure for livestock vaccine	
	Activity differed to next quarter	research and production developed and	
	- Contract for Remodelling of Food	established	
	Biosciences Laboratory at NARL	Livestock research facilities relocated to	
	Kawanda –Phase 2 under GOU	Maruzi ranch, Apac district	
	funding was signed with M/S	Research facilities (including staff	
	Balaji Contractors and works	housing) at NaSARRI for enhanced	
	completed. Penultimate certificate	technology generation rehabilitated	
	to be issued by the NARO Civil	Research facilities (including staff	
	Engineer within the month of	housing) at Rwebitaba ZARDI for	
	November 2017.	enhanced technology generation	
	- Procurement for Supply and	rehabilitated	
	installation of Solar Power was		
	initiated. Advert, Solicitation		
	document, Evaluation team and		
	Procurement method approved by		
	Contracts Committee on condition		
	that Engineers from Ministry of		
	Works are involved in technical		
	support of the design. Ministry of		
	works team was engaged to support		
	with technical requirements.		
	Activity differed to next quarter		
<b>Total Output Cost(Ushs</b>	<b>1.200</b>	<b>0.000</b>	<b>9.830</b>
<b>Thousand):</b>			
Gou Dev't:	1.200	0.000	9.830
Ext Fin:	0.000	0.000	0.000
A.I.A:	0.000	0.000	0.000

## Output: 75 Purchase of Motor Vehicles and Other Transport Equipment

one high range Pick-up	- Procurement for Supply of Station	Four(4) motor vehicles procured. This	
	Wagons was initiated,	will facilitate operations at the livestock	
	Specifications submitted to Chief	research institute at Maruzi, and activities	
	Mechanical Engineer –Ministry of	at the vaccine production facility at	
	Works, awaiting clearance.	Nakyesasa- NaLIRRI.	
<b>Total Output Cost(Ushs</b>	<b>0.350</b>	<b>0.000</b>	<b>1.460</b>
<b>Thousand):</b>			
Gou Dev't:	0.350	0.000	1.460

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Ext Fin:	0.000	0.000	0.000
A.I.A:	0.000	0.000	0.000
<b>Output: 76 Purchase of Office and ICT Equipment, including Software</b>			
An assortment of Office and ICT equipment .	- Contracts for the Supply of Assorted ICT Hardware and Integrated Systems were prioritized according to the available funds and the following was considered:	<ul style="list-style-type: none"> <li>- 15 Desktop computers, 3 Laptops, 2 Scanners and 1 Digital Camera, 1 Heavy duty photocopier, 1 Generator, 2 Lawn mowers, 1 Carpet cleaner &amp; 1 Paper Shredder procured.</li> <li>- ICT Equipment for enhanced Internet connectivity.</li> <li>- Heavy duty photocopying machine procured</li> <li>- Solar lighting on Institute premises installed</li> </ul> <p>1 PC. and Lab machinery. A Local Area Network (LAN), Internet connectivity and ICT harmonisation set up, maintained and secured. Laptops, printers and generator for Bugusege, Lawn mower procure</p> <p>Nabuin (Desk Top Computers core i7 , Printers, Uniinterruptible Power supply (UPS), Staff clock in machine, - Ngetta (computers, printers, laptop computers,photocopiers, scanners, lawn mowers and generator) - Rwebitaba (External Hard disc, intern NASARRI (15 Desktop computers, 3 Laptops, 2 Scanners). Abi (1 Desktop computers, 1 Laptops, 1 Scanners). Buginyanya ( LCD Projector, Generator 15KVA, Deep Freezer, Photocopier (3), Water Dispenser (1) Lawn Mowers (3). Mukono ZARDI (3 Desktop computers,</p>	
<b>Total Output Cost(Ushs Thousand):</b>	<b>0.950</b>	<b>0.000</b>	<b>1.282</b>
Gou Dev't:	0.950	0.000	1.282
Ext Fin:	0.000	0.000	0.000
A.I.A:	0.000	0.000	0.000

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## Output: 77 Purchase of Specialised Machinery & Equipment

<p>An assortment of office, laboratory, workshop and field machinery</p>	<p>- Contracts for the Supply of Assorted ICT Hardware and Integrated Systems were prioritised according to the available funds and the following was considered:</p> <ol style="list-style-type: none"> <li>1. Contract signed with M/S Tinosoft for the Supply of twenty (20) additional computers</li> <li>2. Contract to be signed with M/S MFI for the Supply of Assorted Printers and Photocopiers after confirmation of disbursement of funds by Ministry of Finance on NAROSEC Account.</li> <li>3. Contract signed with M/S Service and Computer Industries for the Supply of Uninterruptable Power Supplies'. Items delivered, tested and accepted. Payments to be effected within the month of November 2017</li> </ol> <p>- Procurement for Supply of an Identity Card System was initiated, Shortlist of firms, Evaluation team and Procurement method approved by Contracts Committee, firms invited, bids evaluated and evaluation report considered by contracts committee. Best Evaluated Bid Notice published and Contract to be submitted to both parties for signature.</p> <p>- Procurement for Supply of a Mobile Filling System under Registry was initiated, Shortlist of firms, Evaluation team and Procurement method approved by Contracts Committee, firms invited, bids evaluated and evaluation report to be considered by contracts committee.</p>	<p>Assortment of fisheries research equipment procured. Assortment of research equipment procured. Tanganyika Jack, Grease gun machine , Laboratory oven and Lawn mowers/machines procured. The wheel loader and grader procured</p>	
<p><b>Total Output Cost(Ushs Thousand):</b></p>	<p><b>0.850</b></p>	<p><b>0.000</b></p>	<p><b>4.296</b></p>
Gou Dev't:	0.850	0.000	4.296
Ext Fin:	0.000	0.000	0.000
A.I.A:	0.000	0.000	0.000

Project : 1139 ATAAS (Grant) EU, WB and DANIDA Funded

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### Output: 72 Government Buildings and Administrative Infrastructure

Functional milking parlour, and a Cattle shed at Nakyesasa-Namulonge	<ul style="list-style-type: none"> <li>- Construction of a Cow Shed at Nakyesasa contracted between NARO and M/S Build base Contractors is behind schedule and currently ongoing at 90% implementation status overall. Cattle headlocks were finally delivered from Denmark and installation concluded. The Contractor is expected to conclude the works by end of December 2017.</li> <li>- An International firm M/S Sterling Cryogenics was identified to construct a Milking Parlor. Engagement of firm awaits clearance from World Bank.</li> <li>- NARO still awaits clearance of additional works implemented by the Contractors from World Bank.</li> <li>- Lab. equip under Lot.2 from ACIA France delivered in Kampala, currently undergoing clearance with Customs. Partial deliveries made to Nakyesasa.</li> <li>- Contract for supply of Assorted Liquid Nitrogen Tanks was signed with M/S Eram (U) Ltd. Partial delivery of Containers delivered to Nakyesasa. Pending deliveries to be made in Q2.</li> </ul>		
<b>Total Output Cost(Ushs Thousand):</b>	<b>2.900</b>	<b>1.500</b>	<b>0.000</b>
Gou Dev't:	0.000	0.000	0.000
Ext Fin:	2.900	1.500	0.000
A.I.A:	0.000	0.000	0.000

### Output: 77 Purchase of Specialised Machinery & Equipment

Assortment of laboratory equipment for the constructed laboratories	<ul style="list-style-type: none"> <li>- Training and Installation of a Soil Analysis Machine-Lot.1 by M/S Mulago Hill Diagnostics was concluded at NARL. Payment effected and file closed.</li> <li>- Contract management under the Supply of Soil Analysis Equipment-Lot.2 contracted by M/S Vision Scientific (U) Ltd still on going. Equipment to be delivered in Q2.</li> <li>Contracts for the Supply of Assorted ICT Hardware and Integrated Systems were prioritized according to the available funds</li> </ul>		
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	and the following was considered: - Contracts to be signed with M/S Tinosoft for the Supply of 3 computers and Installation of LAN etc. Clearance from Solicitor General's office prior to contract signature obtained. - Communication to other service providers concerning unavailability of funds shared. - Running framework contracts for supply of assorted stationery, tonners, conference facilities and tyres on board. Call off orders placed as and when need arises. - Evaluation Reports for Supply of Assorted Equipment in Ghee Processing under KWEG Group-Competitive Grants Scheme where approved by Contracts Committee. Best Evaluated Bid Notice published, Contracts to be signed in Q2. - Invitation of Bids were implemented, evaluations concluded and reports approved by Contracts committee. Best bids published and contracts to be signed in Q2. Supply of Artificial Insemination Equipment and Kits, Microbiology Equipment, Office Equipment and Consumables and Engraving of NARO Assets. - The following are still awaiting clearance from OPM prior to placing of Adverts in the media: Supply of Double Cabin Pick Up and Liquid Nitrogen Truck and Tractors with Assorted Implements. - The following were reviewed by World Bank and waiting clearance: Supply of Semen, Walking Plant Growth Room, Assorted Dairy, Equipment, and Seed Processing Plant.		
<b>Total Output Cost(Ushs Thousand):</b>	<b>9.400</b>	<b>3.200</b>	<b>0.000</b>
Gou Dev't:	0.000	0.000	0.000
Ext Fin:	9.400	3.200	0.000
A.I.A:	0.000	0.000	0.000

### ***V5: VOTE CHALLENGES FOR 2018/19 AND ADDITIONAL FUNDING REQUESTS***

#### **Vote Challenges for FY 2018/19**

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1.The performance target for increased production and productivity from utilization of improved technologies are premised on the non-project budget support for NARO during the periods.

The targets shall however change significantly once a predictable committed and sustainable funding source is obtained. The current ATAAS project expires on 25 June 2018. Currently NARO is writing a project proposal seeking for funding.

2. Livestock research has no committee for release of technologies or practices.
3. The recurring disease and pests epidemics.
4. High pest incidence and damage especially for stem maggot, defoliation beetles, flower beetles and storage weevils.
5. Poor soils and the need to Strengthen soil management development frameworks.
6. Low funding (characterized by unsustainable investment for science and technology, Delayed release of funds, budget inadequacy, Non-sustainable and unpredictable funding, occasional budget short falls)..
7. Weak research-extension farmer – linkages (characterized by Weak dissemination of research findings (first causality for every budget shortfall), weak up-scaling on farm and on-station research demonstrations, Low technology uptake, Low self-motivation (negative mindset) on the part of farmers to embrace opportunities, weak gender and youth engagement).
8. Climate change and Prolonged dry spell and intermittent rainfall in nearly all production agro-ecologies.
9. Low participation and investment by the private sector in R&D.
10. Inadequate human resources and equipment for research.
11. Inadequate basic/foundation seed
12. Conflict with community over grazing areas - Nabuin

**Table V5.1: Additional Funding Requests**

Additional requirements for funding and outputs in 2018/19	Justification of requirement for additional outputs and funding
<b>Vote : 142 National Agricultural Research Organisation</b>	
<b>Programme : 51 Agricultural Research</b>	
<b>OutPut : 01 Generation of agricultural technologies</b>	
Funding requirement US\$ Bn : <b>8.000</b>	Markets are a key component in agricultural development. Technologies developed will be responsive to the existing and new markets (national, regional and international) and markets demands in terms of quality, quantity and geographical coverage.
<b>OutPut : 02 Research extension interface promoted and strengthened</b>	
Funding requirement US\$ Bn : <b>4.000</b>	The increased production and productivity will be enhanced through appropriate gender and equity application under the agricultural research domain. Technology uptake pathways have a diversity of stakeholders who require targeted attention. New skills, access to improved technologies and Public awareness of improved agricultural technologies are essential if increased agricultural production and productivity is to be attained.
<b>OutPut : 04 Agricultural research capacity strengthened</b>	
Funding requirement US\$ Bn : <b>7.000</b>	Staff salary enhancement to motivate and give morale to scientists; Reduce the labour turn-over for green pastures outside the country. NARO salaries should be able to enable the organization to attract, recruit and retain highly skilled and competent scientists. Agricultural research requires high caliber scientific staff to be able to generate new agricultural technologies.