

# Vote:110

## Uganda Industrial Research Institute

### Vote Summary

#### VI: Vote Overview

This section sets out the Vote Mission, Strategic Objectives, and provides a description of the vote's services

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

**Table V1.1: Overview of Vote Expenditures (US\$ Billion)**

	FY2015/16 Outturn	FY2016/17		MTEF Budget Projections				
		Approved Budget	Spent by End Q1	FY2017/18	FY2018/19	FY2019/20	FY2020/21	FY2021/22
Recurrent Wage	3.720	3.720	0.930	3.720	3.906	4.101	4.307	4.522
Non Wage	1.951	2.162	0.298	1.951	2.146	2.360	2.714	3.122
Devt. GoU	7.471	8.323	1.100	8.323	9.571	11.485	13.782	27.565
Ext. Fin.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>GoU Total</b>	<b>13.143</b>	<b>14.205</b>	<b>2.328</b>	<b>13.993</b>	<b>15.623</b>	<b>17.947</b>	<b>20.803</b>	<b>35.208</b>
<b>Total GoU+Ext Fin (MTEF)</b>	<b>13.143</b>	<b>14.205</b>	<b>2.328</b>	<b>13.993</b>	<b>15.623</b>	<b>17.947</b>	<b>20.803</b>	<b>35.208</b>
<i>A.I.A Total</i>	0.000	0.100	0.025	0.090	0.090	0.124	0.144	0.164
<b>Grand Total</b>	<b>13.143</b>	<b>14.305</b>	<b>2.353</b>	<b>14.083</b>	<b>15.713</b>	<b>18.071</b>	<b>20.947</b>	<b>35.372</b>

#### (ii) Vote Mission Statement

The Mission of the Institute is "To catalyze the socio-economic transformation of Uganda and the Region through enhanced Research and Development, and Technology use."

**Table V1.2: Sector Outcomes and Key Output Indicators**

<b>Programme :</b>	51 Industrial Research
<b>Programme Outcome:</b>	Industrial Product Development and Technological Advancement
<b>Objective :</b>	<p>UIRI is a parastatal organization operating under the auspices of the Ministry of Trade, Industry, and Cooperatives. It is the lead agency for spearheading Government efforts at industrialization through industrial research and technology transfer in the country.</p> <p>The key objectives of this Programme include the following.</p> <ol style="list-style-type: none"> <li>1. To undertake applied research for the development of products and optimal production processes, for Uganda's nascent industry.</li> <li>2. To develop and /or acquire appreciate technology, in order to create a strong, effective and competitive industrial sector.</li> <li>3. Act as a bridge between academia, government, and the private sector with respect to commercialization of innovation and research results.</li> <li>4. Spearhead value addition activities in conjunction with national development priorities.</li> <li>5. Lead the national effort in technology transfer and technology diffusion, to assure the development of appropriate technologies.</li> </ol>
<b>Responsible Officer:</b>	Prof. Charles Kwesiga

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Programme Performance Indicators (Output)	2016/17 Target	2017/18 Target	2018/19 Target	2019/20 Target
<b>Sector Outcome : A Strong Industrial Base</b>				
• No. of SME's incubates taken on	15	12	24	36
• No. of technologies deployed with incubatees	25	22	28	34
• No. of SMEs trained in industrial development and value addition processing	1200	1400	1600	1800
• No. of apprenticeships taken on	80	85	90	95
• No. of local raw materials developed and populated in the scientific databases	55	55	60	65
• No. of model value addition centres at 75% completion	4	75%	75%	75%
• No. of products up-scaled and commercialized by the centres	35	90%	90%	90%
• No. of existing indigeous technologies upgraded and strengthened through basic and applied research		22	28	34
• No. of new technologies innovated		4	6	8
• No. of technologies deployed		5	10	15
• No. of product analyses undertaken for quality checks	3032	180	240	320
• No. of research projects initiated	15	4	4	4
• No. of value added products developed for industrialisation to reduce post harvest losses	45	45	50	55

## V2: Past Vote Performance and Medium Term Plans

### Performance for Previous Year FY 2015/16

Highlights of UIRI's achievement during FY 2015/2016 include:

UIRI was selected as a “*Centre of Excellence for EAC in R&D*” in 2012. However, the actual honours were bestowed on Nov 30th, 2013 during the Heads of State Summit at Munyonyo. Given our tentative start, full 20 years after peers in EAC, this coming from behind win is a crowning

On 18th September 2014, UIRI's Executive Director, Prof. Charles Kwesiga was elected, unopposed, to be the next President of WAITRO (World Association of Industrial and Technological Research Organizations).

Through this, UIRI has been host of two international workshops: The 74th WAITRO Board Meeting, 15th Regional Focal Point Meeting and Networking Conference (March 2015) and; in December 2015, a capacity building workshop on utilization of locally available renewable energy resources for economic growth.

### Research and Development

UIRI provides product and industrial process development services through testing and microbiological and chemical quality assurance; provision of analytical services, since microbiological quality is a critical determinant of competitiveness of manufactured products. As a modern research centre we facilitate utilization of biological and biochemical systems for transformation of natural resources for economic benefits.

1. Analyzed 281 laboratory samples for chemical composition. The laboratory samples included; food, alcoholic beverages, cosmetics, plants.
2. Analytical Microbiology provided testing services to industry and 402 samples analyzed

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3. The Chemistry Laboratory attained certification and recognition by Uganda National Bureau of Standards, UNBS
4. Complied all the required laboratory documentations for implementation of ISO 17025 (Accreditation)
5. AgriLASA membership Subscription for year 2015 and 2016 was paid
6. The Chemistry Laboratory participated in analysis of the PTS samples submitted as required by ISO 17025 standard for testing Laboratory
7. The Food Laboratory provided Technical and Advisory Services to a multitude of entrepreneurs involved in processing and handling of food. Services cover the entire value chain from ideation through to commercialization and on improved products. This enables increased survival of businesses and increases the number of food products that comply with National Standards.
8. The Microbiology Laboratory participated in the NQCSSES Round 001/16 Proficiency Test which is coordinated by the Botswana Bureau of Standards
9. Innovative Product Development in a range of new products:
  - a. Non-dairy frozen dessert (Popsicle/Frozen Juice bar)
  - b. Tamarind Juice
  - c. Ready-to-use condiments – marinades, dressings, sauces
  - d. Sorghum wine
  - e. Canned maize-bean mix (empengyere)
  - f. Nutraceuticals - Hibiscus juice, Hibiscus Powder, Chia seeds, Aloe Vera Juice, Mushroom powder and mushroom enriched flour (Prototypes of the mentioned products)
10. Standardized processes for manufacture of the mentioned products
11. Handmade paper production from Banana, Pineapple fiber, Cotton and waste paper for production of Biodegradable paper bags and beads, 52 Papers, 18 Bags, 25 beads were produced.
12. Charcoal briquettes from local materials. Empowerment of Youth in Rukiga; Kabale
13. Participated in Institutional Collaborative Initiatives and undertook a number of initiatives in collaboration with other players:
  - i. Participated in a project dubbed “Promotion of Traditional Grains as the “Super foods” of East Africa. This was in collaboration with African Center for Economic Transformation (ACET), Pardee Rand Graduate School, U.S Global Development Lab, Africa Innovations Institute, Resilient Africa Network, Makerere University and Saladin Media.
  - ii. Jointly developed a proposal “Extraction of Proteins and Starch from Underutilized Indigenous Legumes for Application in Food and Food Packaging Systems” with Fraunhofer Institute for Process Engineering and Packaging ( Fraunhofer IVV), Germany for funding by the German Ministry for Education and Research (BMBF).
  - iii. Institute popularized among collaborators. Co-operate ties established for future partnerships and collaborations
  - iv. Broadened horizons through contact with world-renown RTOs

### Under Instrumentation

- 1) Venturewell Sustainable Grant (US\$33,000) with Columbia University, Department of Biomedical Engineering, Fu Foundation School of Engineering and Applied Science ( 02/2015)
- 2) Oral Presentation at the World Congress on Biomedical Engineering and Medical Physics 2015, Toronto, Canada – ‘ Appropriate Medical Devices for Low Resource Settings: Electronically Controlled Gravity Feed Intravenous Infusion Set’ (06/2016)
- 3) Finalists, Saving Lives at Birth: Grand Challenge for Development, invited for Development Exchange in Washington, DC ( Top 6% out of 750 applicants) for the MUTIMA: Low cost diagnostic tool for Pneumonia

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(07/2015)

4) Poster presentation at World Food System Conference 2015, Ascona, Switzerland- Smart Grain Silo

(06/2015)

5) Invitation to join Global Pneumonia Innovations Team (07/2015)

6) Oral Presentation and publication in the Digital Xplore Online Journal at the 2015 IEEE AFRICON Conference in Addis Ababa, Ethiopia- Low Cost Electronically Controlled Gravity Feed Infusion Set

(10/2015)

7) 1st Place Innovation Award (US\$50,000) at the World Summit on Patient Safety, Science and Technology , Dana Point, California, USA (01/ 2016)- ECGF Infusion Set Project

8) Oral Presentation at the 2015 Canadian Medical and Biomedical Engineering Conference, Calgary, Alberta – ‘ Medical Device Electronics Development in Low Resource Settings: A Ugandan Perspective’ (05/2016)

### Essential Oil Pilot Project

1) At the Essential Oil Pilot Plant 300 seedlings of Rose geranium were transplanted. 3,957 seedlings of Lemon balm which were still surviving in the nursery out of the trays propagated in January 2016.

2) The transplanted seedlings were used to backfill one plot of Rose geranium near the nursery and three plots of Lemon balm near the water tank.

3) More trays of Rose geranium and Lemon balm during have been propagated - Season B(Apr - Jul) of 2016 in order to achieve the required 6000 plants of Rose geranium &12000 plants of Lemon balm for sufficiently expanding mother block at UIRI's Essential Oil Pilot Station.

4) In May the Project Team has finalized plans to introduce some local aromatic plants like Lemon grass and Rosemary whose oil extract is already on demand in the domestic market.

5) 2 pilot plots of Lemon grass were established at the Essential Oil Pilot Station. One plot of Lemon grass has a plant population of 532 and the second plot has 649.

6) 1400 cuttings (7 nursery trays) of Rose geranium and 7 trays of Rosemary (4 trays of Rosemary exotic and 3 trays of Rosemary local) were propagated and will be ready for transplanting in August 2016 (Season C). Rosemary was propagated earlier in the month of May 2016 and it has already started developing roots. On the other hand, Rose geranium was propagated in the last week of May 2016.

7) Liquid manure was prepared and applied it on all existing plants in the pilot plots to boost their vegetative growth in current rains.

8) Raised 780 nursery seedlings of Rose geranium out of the 7 trays propagated in May 2016, at a success rate of 55.71%.

9) 3 more trays of Rose geranium (600 cuttings) were propagated which are now 4 weeks old to avail us with more seedlings for expanding the mother garden.

10) The project team has also managed to raise 612 seedlings of Rosemary-local out of the 3.5 trays propagated in May 2016 and 366 seedlings of Rosemary-exotic out of the 5 trays propagated, a success rate of 83.8% for Rosemary-local and 36.6% for Rosemary-exotic.

11) Hardening the seedlings in nursery mid-July 2016 so that they are ready for transplanting at on-set of rains in August 2016 (Season C).

12) Lemon grass and Rosemary have been introduced at the Field Station rains since those oils are being sought after in the local market

### Minerals and Materials Engineering Division

1) Designed and customized Model and Mold making for fragrance candle. The activities include Designing, Lathe machine works, Model curving and finishing, Mold assembling

2) Produced ceramic buttons and beads. The activities include: Raw material preparation, Formulation, Pressing and casting, Firing and Glazing,

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- 3) Potter's Wheel throwing Outside Flower Pots involved, Preparing of the clay material, throwing of the bodies, finishing and firing
- 4) Produced and installed Artificial Ceramic Coral reefs to boost fish breeding in water bodies. Completed prototypes that were made to better dimensions
- 5) Compiled and submitted the final Project Proposal of the Gemstone cutting as a possible project to be implemented in Karamoja region, whose Pilot studies were successfully completed, under Stone Cutting Technology
- 6) Production of School chalk - Dustless chalk. This included raw material preparation, formulation, Production
- 7) Under mineral processing, Clay samples from Kalangala Women group were prepared, milled and screened to attain the right particle sizes
- 8) Raw Material testing, Soil and Rock samples from Moriemu in Abim District, Lupa in Moroto District, Kirembe in Kasese District. This included material sorting, milling, characterization, gold testing
- 9) Ceramic Water filters for domestic drinking water filters were produced. This involved Raw material preparation, Formulation, Pressing ceramic filter containers, Firing, Testing the filter for performance

### Industrial and Technological Incubation

Business Incubation services for entrepreneurs who have not yet acquired enough capital to set up their own processing units.

- Practical training programs in processing and production of dairy products ,quality control and quality assurance
- Technological problem solving :-e.g. quality up-gradation, value addition, new product and process development, product improvement
- Advice on choice of dairy processing equipment and machinery, plant layout and process design.
- Establishment of quality assurance systems; e.g. GMP, GHP, HACCP, etc
- Guiding clients in writing techno-economic feasibility report and business plans for dairy processing entrepreneurs projects
- Processing new products during trial phase for private companies.

It was set up as research training and technology development centre geared towards conducting applied industrial research and addressing the needs of the Bakery industry in Uganda specifically the micro, small and medium scale enterprises (MSMEs) with the aim of generating appropriate bakery processing technologies. The department also offers training opportunities to students from higher institutions of learning within the country.

#### Food Technology Laboratory

1. Quality evaluation, standardization and commercialization of Slice Mango Juice Products were analyzed for microbial and chemical composition. (There is continuous improvement of the quality and commercialization of Slice Mango Juice)
2. Upscaling production of Zena Ready to Drink Juices. Production has been up scaled from 100liters to 300 liters per day
3. Two incubatees were take on in the Fruits and Vegetable incubation program
4. Expansion of the Fresh Milk Cold Room - The fresh milk cold room was expanded to accommodate the increased production volume of pasteurized milk and yoghurt. A new building was constructed attached to the old cold room and equipped with cold room facilities by Batidan Consulting Engineers. It has been commissioned and is now being used for cold storage of the above products by M/s Premier Dairies ltd
5. Karubuga Dairy Farm was supplied with Dairy Processing Equipment by M/s Engineering Solution Ltd. The equipment was delivered to the project site. Installation, training and commissioning will commence in the next financial year.
6. Under Dairy Technology there are 7 incubatees;
  - Premier Dairies Ltd: processing a monthly average of 186,673 liters of Pasteurized milk and 12,300 ltrs of

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Yoghurt and employing 30 people.

- Z-plus Ltd: producing a monthly average of 3,800 liters of Yoghurt and employing 6 people
- Grace K Magumba: producing a monthly average of 2,400 liters of Yoghurt and employing 4 people
- Nutrition Food: producing a monthly average of 900 liters of Yoghurt and employing 3 people
- Mabira Estates C&DG producing a monthly average of 900 liters of Yoghurt and employing 3 people
- Model Professional Consult: producing a monthly average of 2,300 liters of Yoghurt and employing 4 people
- Kabeiura Farmers (Virtual) producing a monthly average of 6,000 liters of Yoghurt and employing 6 people

The two incubation farms M/S Adeke Farm and M/S Millionaire Gals Farm have not yet been fully established as there is still infrastructure gaps to be put in place

7. The Vaccine Production Unit finalized formulation trials to improve vaccine yield by an additional 50%. As a result installed capacity at the facility has increased from 185million vaccinations to 245million vaccinations without a need for increase in manpower, equipment or man-hours.

8. Continued distribution of Newcastle Vaccine in the Uganda mainly eastern and central Uganda. Total Sales during Quarter 4 were 3,011,000 doses. Of which 887,500 can be accurately traced to smallholder farmers in a total of 9,543 households.

9. Under bakery technology there are

- VASH-KAN Investments Ltd formerly known as Unmatched Enterprises produces cookies, cakes i.e. ceremonial, queen and banana cakes
- Trade Masters (U) Ltd: produces sweet and brown bread, sweet buns and a variety of cakes (queen, madeira, and lemon)

### Performance as of BFP FY 2016/17 (Performance as of BFP)

The following performance has so far been registered at the Institute for the Financial Year 2016/17.

1. UIRI was awarded a First Prize of US\$ 50,000 at the Patient Safety Science and Technology, Innovation Summit for innovation of an Electrically Controlled Gravity Infusion Set.
2. UIRI was awarded a US\$ 33,000 Sustainable Vision Grant to use Columbia University's Global Technology Program as a platform to develop neonatal electronic medical monitoring and diagnostic devices in Uganda.
3. Pioneering a local Vaccine against Newcastle Disease in poultry. A pilot production plant launched by H.E the President in August 2011 and is now fully operation and the vaccine is on the market. It is a first in the region in that the vaccine is thermal-stable and requires no refrigeration.
4. We have established a “Biotechnology Centre of Excellence” and a number of products have been developed.
5. UIRI’s Instrumentation Unit is engaged in production of electronic equipment such as Inverters, Power Supply units, Signal Generators, Automatic voltage regulators, etc. We have pioneered the use of Printed Circuit Board (PCB) technology in the region.
6. Development of a low-cost and scalable production technology for production of bioethanol
7. Development of an organic fertilizer named “BIOCHAR”. Initial trials have indicated that, this fertilizer protects the soil content and improves farmer’s yields.
8. Development of a variety of innovative food products which include; probiotic and honey sweetened yogurt, fish and soya sausages, blended juices, peanut butter, potato chips and crisps, wines etc.
9. Design and development of a range of innovative ceramic products such as tiles, cups, plates, and ornamental products.
10. Pioneering a local Vaccine against Newcastle Disease in poultry. A pilot production plant launched by H.E the President in August 2011 and is now fully operation and the vaccine is on the market. It is a first in the region in that the vaccine is thermal-stable and requires no refrigeration.

**Table V2.1 Past and FY 2017/18 Key Outputs**

FY2016-2017		FY 2017-2018
Appr. Budget and Planned Outputs	Expenditures and Achievements by end Q1	Proposed Budget and Planned Outputs

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<b>Vote: 110 Uganda Industrial Research Institute</b>			
<b>Program :51 Industrial Research</b>			
<b>Output : 02 Research and Development</b>			
Under Research and Product Development: The Institute acts as a central point for identifying new uses for existing raw materials, improvement and adaptation of materials to higher technology application and develops an integrated matrix for value additio	<ul style="list-style-type: none"> <li>Analyzed 1109 laboratory samples for chemical composition and 100 for microbial Analysis</li> <li>No new projects were initiated</li> <li>16 value added products were developed</li> </ul>	<ol style="list-style-type: none"> <li>1. Conduct research to develop new innovations by product, technology or process</li> <li>2. Provide laboratory analytical services</li> <li>3. Develop new food and nonfood products</li> <li>4. Progress with Laboratory Accreditation</li> <li>5. Publish research journals</li> <li>6. Register patent</li> </ol>	
<b>Total Output Cost(Ushs Bn):</b>	<b>2.000</b>	<b>0.325</b>	<b>1.248</b>
<b>Output : 03 Industrial and technological Incubation</b>			
<ul style="list-style-type: none"> <li>BUSINESS INCUBATION: This involves supporting and nurturing start-up businesses so that they grow into sustainable enterprises. We provide equipment and facilities such as physical space, laboratory services, skills training, market and other business s</li> </ul>	Technical Support was given to Mekia Ltd. in an embedded systems in theft detector and a transport monitoring systems, CD Research Life Sciences developing a diagnostic kit for early HIV detection and drug resistance, Brentec Uganda Limited in production of Newcastle Vaccine, Handmade paper production, 7 Incubatees in Dairy Technology, 2 Bakery Technology, 10 Meat Technology, 6 Fruit and Vegetable Technology others under virtual incubation	<ol style="list-style-type: none"> <li>1. Incubate enterprises in agro processing, mineral beneficiation, ICT, Energy systems, instrumentation by providing technical support,, quality management and business management services</li> <li>2. Human capital development</li> <li>3. Increase manufactured products</li> </ol>	
<b>Total Output Cost(Ushs Bn):</b>	<b>1.600</b>	<b>0.210</b>	<b>0.832</b>
<b>Output : 04 Model Value Addition Centre Establishment</b>			
Establishment of Model Value Addition Centers has proved to impact on poverty reduction. The Established Model Value Addition Centers stimulate increased farm production. The farmers' area assured of ready market where they can generate some income. The c	5 facilities are over 85% complete. These include: the Fruit Processing Facility in Arua District, the Model Dairy Farm in Karubuga Ntungamo District, the Fruit Juice Processing Facility in Itojo, the Meat Processing Facility in Arua District, and the proposed distillation plant for Essential Oils Pilot Project in Luweero.	<ol style="list-style-type: none"> <li>1. Establish 4 regional model value addition centers per financial year</li> <li>2. Reduced post-harvest loss</li> <li>3. Increase house hold incomes</li> </ol>	

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<b>Total Output Cost(Ushs Bn):</b>	<b>1.110</b>	<b>0.022</b>	<b>1.069</b>
<b>Output : 05 Facility Repair and Maintenance</b>			
1. Repair and maintenance of machinery and equipment for a well maintained pilot plant 2. Procurement and upgrading of the Existing Wastewater Treatment Plant with Advanced Immobilized Cell Reactor (AICR) Smart	1. Completed renovation of the floor at TDC Engineering workshop 2. Completed constructed of Cold room at the UIRI Dairy Technology	1. Periodic and routine maintenance of machinery, equipment and infrastructure carried out 2. Repairs of machinery, equipment and infrastructure 3. Planned servicing of machinery, equipment and infrastructure carried out	
<b>Total Output Cost(Ushs Bn):</b>	<b>0.500</b>	<b>0.000</b>	<b>0.660</b>
<b>Output : 06 Industrial Skills Development and Capacity Building</b>			
Development of human resource skills needed for comprehensive handling of new and existing technologies aimed at achieving market and product research match, appropriate and cost effective technologies for promotion and development of value added industri	<ul style="list-style-type: none"> <li>• 142 people were offered industrial training in various fields and</li> <li>• 104 people trained in business development life cycle and 4 incubatees were taken on</li> <li>• 321 from Micro and Small Medium Enterprises trained in cosmetic, agro-processing, handmade paper production, meat and dairy processing, and material processing</li> <li>• 23 people trained apprenticeship in carpentry, textile and fabrication of machinery and small equipments</li> </ul>		
<b>Total Output Cost(Ushs Bn):</b>	<b>0.120</b>	<b>0.000</b>	<b>0.000</b>
<b>Output : 07 Technology, Innovation, Transfer and Development</b>			
	Development of the following technologies were undertake during Q1 Design of a solar powered autoclave for sterilization of surgical equipment in low resource settings (mediclave); Low cost scalable bioethanol; Development of a low cost Hydraulic briquetting machine.	1. Technologies developed and deployed 2. Technologies transferred 3. Technologies diffused into the industrial base	
<b>Total Output Cost(Ushs Bn):</b>	<b>0.400</b>	<b>0.000</b>	<b>0.972</b>
<b>Total Program Cost (Ushs Bn):</b>	<b>5.730</b>	<b>0.558</b>	<b>4.781</b>
<b>Total Vote Cost (Ushs Bn):</b>	<b>5.730</b>	<b>0.558</b>	<b>4.781</b>



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## FY 2017/18 Planned Outputs

The Institute has planned the following outputs for Financial Year 2017/18.

1. Improved industrial production infrastructure and capabilities
2. Development of innovations and technologies
3. Increased technology uptake
4. Enhanced and expansion of industrial training and incubation services
5. Enhanced knowledge transfer
6. Large pool of skilled and certified professionals
7. Increased production of value added and competitive production
8. Production of veterinary vaccine solutions
9. Mineral beneficiation
10. Development of ICT products
11. Development of electronic and automated solutions for utilization by various sectors

## Medium Term Plans

The following priority strategies are premised on NDPII; Vision 2040; and middle income status by 2020

1. Develop products and deploy technologies for value addition
2. Develop an STI Hub to coordinate R&D activities and consolidate Technology Transfer initiatives and practices
3. Establish a Machining and manufacturing facility in conjunction with an Industrial Skills Training Centre at Namanve – Chinese Government grant of \$30m is to build and equip the facility.
4. Initiate the creation of regional value addition centres to address products prevalent in specific regions
5. Expand our business incubation portfolio and accelerate graduation from the incubator for some of the enterprises.

## Efficiency of Vote Budget Allocations

In order to ensure efficiency of the Vote Budget Allocation, the following measures shall be undertaken during implementation of the Budget for Financial Year 2017/18.

1. Timely utilization of resources
2. Improved project planning

**Table V2.2 Allocations to Key Sector and Service Delivery Outputs Over the Medium Term**

<i>Billion Uganda Shillings</i>	<b>(i) Allocation</b>				<b>(ii) % Vote Budget</b>			
	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20
Key Sector	5.110	4.121	6.130	7.783	89.2%	86.2%	90.3%	90.1%
Service Delivery	0.620	0.660	0.657	0.852	10.8%	13.8%	9.7%	9.9%

**Table V2.3 Key Unit Costs of Services Provided and Services Funded (Shs '000)**

N / A

## Vote Investment Plans

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The Capital Investments planned for the coming Financial Year will include establishment of Model Value Addition Centres and purchase and installation of assorted machinery and equipment.

### V2.4 Allocations by Class of Output Over the Medium Term

<i>Billion Uganda Shillings</i>	(i) Allocation				(i) % Vote Budget			
	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20
Consumption Expenditure (Outputs Provided)	11.658	10.664	13.210	15.480	82.1%	75.1%	83.3%	85.0%
Grants and Subsidies (Outputs Funded)	0.000	0.000	0.000	0.000	0.0%	0.0%	0.0%	0.0%
Investment (Capital Purchases)	2.548	3.541	2.646	2.723	17.9%	24.9%	16.7%	15.0%
<b>Total</b>	<b>14.205</b>	<b>14.205</b>	<b>15.856</b>	<b>18.203</b>				

**Table V2.5: Major Capital Investment (Capital Purchases outputs over 0.5Billion)**

FY 2016/17		FY 2017/18
Appr. Budget and Planned Outputs	Expenditures and Achievements by end Q1	Proposed Budget and Planned Outputs
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Programme : 51 Industrial Research		
Development Project : 0430 Uganda Industrial Research Institute		

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## Output: 72 Government Buildings and Administrative Infrastructure

1. Proposed warehouse for cereals in Mbarara	During Q1, FY 16/17 the following was achieved in establishing Government Nonresidential buildings and administrative infrastructure	A Prototyping Lab Project - Remodeling PCB Laboratory established;	
2. Proposed construction of a winery in Mbarara			
3. Construction of a Tile factory in Wakiso			
4. Construction of a barkery and honey processing plant in Kabale			
5. Construction of a Poultry feed factory in Kamweng			
	1. Design for establishment a Fabrication Laboratory. (Fab Lab Kampala) for small scale manufacturing of circuit boards and casings for complete prototypes. Currently the Civil Works Department is working on Construction details to remodel the PCB laboratory facility. With the new development of the EU Horizon 2020 project there is a need for an open source innovation space for the activities of this grant for the next 2 years. The Project proposal has been completed, start of project pending funding. There is need for 372,900,000UGX for the Implementation of the entire facility which include Renovation/expansion of space/consultants/staff/ equipment procurement/workshops	Designs of a mushroom facility;	
	2. Remodeled the handmade Paper structure/Extended the Structure for Installation of the new handmade paper equipment	Civil Works completed for Microbiology laboratory	
		Bulk Potato storage facility constructed;	
		Construction of the Instrumentation Laboratory;	
		Refurbishment of the paper plant at UIRI	
<b>Total Output Cost(Ushs Thousand):</b>	<b>0.800</b>	<b>0.080</b>	<b>1.045</b>
Gou Dev't:	0.800	0.080	1.045
Ext Fin:	0.000	0.000	0.000
A.I.A:	0.000	0.000	0.000

## Output: 77 Purchase of Specialised Machinery & Equipment

CHEMISTRY	Due to the heavy budget shortfall in Q1, FY 16/17 the following are the only equipment's that have been procured	Electronically Controlled Gravity Infusion Set- Prototype Development Mediclave - Solar powered autoclave Development of MUTIMA- diagnostic device for Pneumonia Purchase PCB Laboratory Equipment for the Prototyping Laboratory Project Machine Fabrication of Milling and bagging machine for a Silver Fish milling Facility  Poultry Processing Line for KAMADIC
10. Preventive maintenance and service of high-tec lab equipment's per year		
11. Procurement of Laboratory Centrifuge		
12. Procurement of Analytical Balance		
13. Procurement of GC-MS (for Essential oil analysis)		
14. Procurement of F	1. Received Part 1 of shipment for undertaking Printing of Circuit Boards for the ECGF Infusion Set Project	
	2. Received shipment of supplies for undertaking CNC Drill bits for fabrication of Printed Circuit Boards for Instrumentation Division Projects	

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	<p>3. Procurement of Kaganga Dairy Equipment was initiated</p>	<p>Purchase of a Fruit electric dryer for Product Development                  Purchase of a small scale wine filling machine; ball bearings and other spare parts for the pineapple juice extractor; cartridges for the water purification system                  Procurement of equipment for Karubuga Dairy Processing Facility in Ntungamo                  Purchase of equipment for Kabale Potato Processing Facility;                  Fabrication of assorted processing equipments such as a Passion Juice Extractor, Batch pasteurizer &amp; Blending tank                    Fabrication of soap slicing machines                    Supply of spare parts and tools for repair, general servicing, periodic maintenance of Pilot Plant equipments                  Hatchery for poultry markmat agro-processors                    Equipping of the Textile Technology Section                  Equipping Sure Dairy Farm Limited                    Equipping in support of virtual incubation in Kabale District                    Briquette Making /Processing Mineral Beneficiation . Adding value to Low – Value Minerals like Sand, Talc, Salt, Feldspar, Kaolin, Clay, Limestone, Bentonite, Vermiculite etc                    Handmade Paper Production Project                    Essential Oil Pilot Project                  Equipping Microbiology Laboratory                  Equipping of the Food Laboratory                  Equipping of the Chemistry Laboratory                  Equipping Energy Systems Projects                  Solar Water Heater Assembly                  Establishment of a Dairy Processing Facility in Namanve</p>	
<b>Total Output Cost(Ushs Thousand):</b>	<b>1.648</b>	<b>0.442</b>	<b>2.497</b>
Gou Dev't:	1.648	0.442	2.497
Ext Fin:	0.000	0.000	0.000
A.I.A:	0.000	0.000	0.000

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## V3: Proposed Budget Allocations for 2017/18 and the Medium Term Projections

Table V3.1: Past Expenditure Outturns and Medium Term Projections by Programme\*

Billion Uganda shillings	FY 2015/16 Outturn	FY 2016/17		Medium Term Projections				
		Approved Budget	Actual Releases by End Q1	2017-18	2018-19	2019-20	2020-21	2021-22
<b>Vote :110 Uganda Industrial Research Institute</b>								
Programme: 51 Industrial Research	13.143	14.205	2.328	13.993	15.623	17.947	20.803	35.208
<b>Total for the Vote</b>	<b>13.143</b>	<b>14.205</b>	<b>2.328</b>	<b>13.993</b>	<b>15.623</b>	<b>17.947</b>	<b>20.803</b>	<b>35.208</b>

### Major Expenditure Allocations in the Vote for FY 2017/18

In the coming Financial Year 2017/18, the following major expenditure allocations are envisaged including:

1. Purchase of specialized Machinery
2. Establishment of Model Value Addition Centers
3. Technology Innovation Transfer & Development
4. Research and Development
5. Industrial Technology and Business Incubation

Table V3.2: Key Changes in Vote Resource Allocation

Major changes in resource allocation over and above the previous financial year	Justification for proposed Changes in Expenditure and Outputs
<b>Vote :110 Uganda Industrial Research Institute</b>	
<i>Programme : 51 Uganda Industrial Research Institute</i>	
<b>Output: 02 Research and Development</b>	
Change in Allocation (US\$ Bn) : (0.752)	Static budget MTEF cannot allow increase in item allocation because the cost of consumables required to undertake research are increasing
<b>Output: 03 Industrial and technological Incubation</b>	
Change in Allocation (US\$ Bn) : (0.768)	Static budget MTEF cannot allow increase in item allocation because the cost of consumables required to facilitate the incubation program are increasing
<b>Output: 05 Facility Repair and Maintenance</b>	
Change in Allocation (US\$ Bn) : 0.160	UIRI has an increasing number of facilities that require routine maintenance and repairs of machinery, equipment and infrastructure
<b>Output: 06 Industrial Skills Development and Capacity Building</b>	
Change in Allocation (US\$ Bn) : (0.120)	Major activities under this item shall be expensed in the recurrent budget

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<b>Output: 07 Technology, Innovation, Transfer and Development</b>	
Change in Allocation (US\$ Bn) : <b>0.572</b>	There will be increased focus in FY 17/18 on developing affordable yet appropriate technologies for dissemination to catalyze/speed up industrial development
<b>Output: 08 Popularization of research and technologies</b>	
Change in Allocation (US\$ Bn) : <b>(0.045)</b>	Major activities under this item shall be expensed in the recurrent budget
<b>Output: 72 Government Buildings and Administrative Infrastructure</b>	
Change in Allocation (US\$ Bn) : <b>0.245</b>	The need to establish more nonresidential and administrative buildings
<b>Output: 76 Purchase of Office and ICT Equipment, including Software</b>	
Change in Allocation (US\$ Bn) : <b>(0.100)</b>	Required items under shall be purchased in the recurrent budget
<b>Output: 77 Purchase of Specialised Machinery &amp; Equipment</b>	
Change in Allocation (US\$ Bn) : <b>0.849</b>	There is a lot of pending machinery and equipment to be purchased due to budget shortfalls accumulating from FY 15/16, Q1,Q2 of FY 16/17

## V4: Vote Challenges for 2017/18 and the Medium Term

### Vote Challenges for FY 2017/18

The Institute faces the following challenges that are inhibiting its performance and delivery of its mandate.

1. Inadequate application and utilization of scientific research and technology for development
2. Inadequate capitalization of current model processing facilities and commercialization of business incubation projects
3. Uncompetitiveness of local industries
4. Inadequate budget allocation under MTEF
5. Deficit between allocated and actual released budget funds
6. Expensive financing from financial institutions to undertake R&D projects
7. Low technical skills
8. Lack of funds to support commercialization of innovations, technologies and products (Industrialization and Innovation Fund)
9. Inadequate remuneration for retention of highly skilled scientists and engineers
10. Absence of critical technical skills
11. Weak inter-institutional cohesion and cooperation
12. Limited levels of entrepreneurial competences in our society
13. Lack of adequate infrastructure and limited connectivity
14. Governmental and societal ambivalence with regard to Research and Development

**Table V4.1: Additional Output Funding Requests**

Additional requirements for funding and outputs in 2017/18	Justification of requirement for additional outputs and funding
<b>Vote 110 -- Uganda Industrial Research Institute</b>	

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Programme : 51 -- Industrial Research	
<b>Output : 01 Administration and Support Services</b>	
Funding requirement US\$ Bn : <b>4.800</b>	Currently UIRI has 244 vacant positions. Filling the vacant positions would go a long way to boost a more productive Human Capital required to spur the aspirations of Research that stimulates development
<b>Output : 02 Research and Development</b>	
Funding requirement US\$ Bn : <b>29.790</b>	This funding will help to: <ol style="list-style-type: none"> <li>1. Enhance the integration of science and technology into the national development process.</li> <li>2. Provide adequate state-of-the art STI infrastructure.</li> <li>3. Increase transfer and adoption of technologies</li> <li>4. Enhance R&amp;D in Uganda</li> <li>5. Enhance the integration of Science and technology into the national development process</li> <li>6. To enhance efficiency and effectiveness in skills delivery</li> </ol>
<b>Output : 04 Model Value Addition Centre Establishment</b>	
Funding requirement US\$ Bn : <b>10.595</b>	Emphasizes agro-processing and marketing as a launch path to industrialization. Investment in value addition to agricultural products can expand the GDP size, while improving the Country's Balance of Payments Position (BOP). Establishment of light manufacturing/agro-processing industries in Uganda would create good paying jobs
<b>Output : 03 Industrial and technological Incubation</b>	
Funding requirement US\$ Bn : <b>10.500</b>	Enhance the integration of science and technology into the national development process Increase transfer and adoption of technologies To increase equitable access to appropriate skills training at all levels Improve quality and relevance of skills development Increase the share of manufactured goods and services in total exports Improve private sector competitiveness Increase market access for Uganda's goods and international markets Increase the stock of new manufacturing jobs
<b>Output : 77 Purchase of Specialised Machinery &amp; Equipment</b>	
Funding requirement US\$ Bn : <b>5.250</b>	Particular effort will be made to transfer value addition technologies, procurement of specialized machinery and Equipment and offer agri-business skills to women and youth. The private sector will be supported to establish technology incubation centres to enable promotion of technological innovation as well as importation and adoption of low cost technology.