

# 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 below summarises the Medium Term Budget allocations for the Vote:

**Table V1.1: Overview of Vote Expenditures (UShs Billion)**

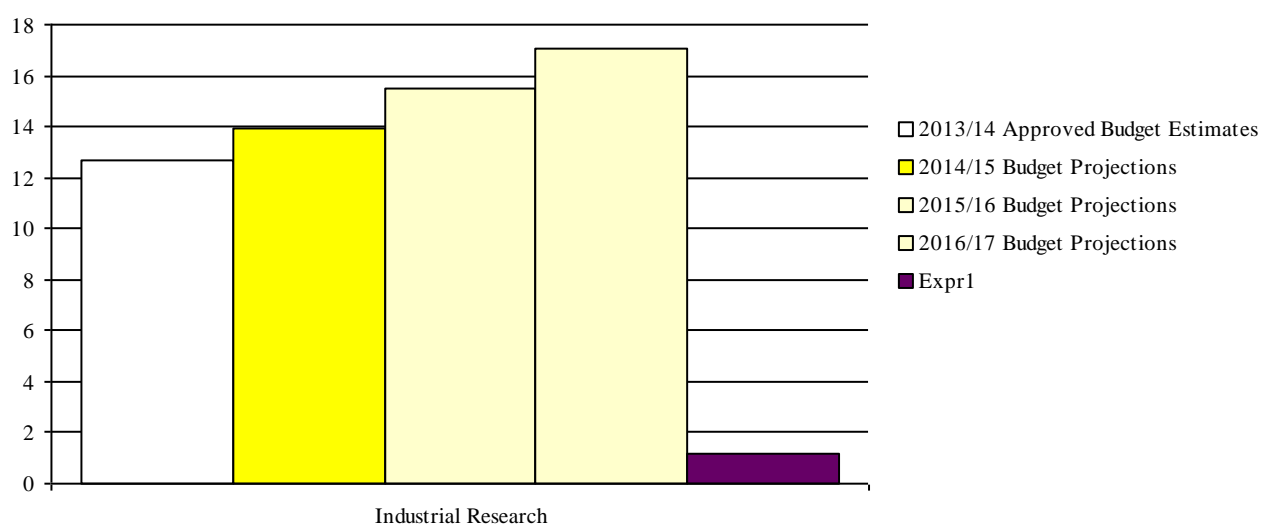
	2012/13 Outturn	2013/14		MTEF Budget Projections		
		Approved Budget	Spent by End Dec	2014/15	2015/16	2016/17
<i>(i) Excluding Arrears, Taxes</i>						
Recurrent						
Wage	0.000	4.069	2.034	4.069	4.069	5.195
Non Wage	5.317	1.520	0.708	1.520	1.664	1.730
Development						
GoU	6.226	8.323	4.037	8.323	9.737	10.127
Ext.Fin	0.000	0.000	0.000	0.000	0.000	0.000
<b>GoU Total</b>	<b>10.843</b>	<b>13.912</b>	<b>6.778</b>	<b>13.912</b>	<b>15.471</b>	<b>17.052</b>
<b>Total GoU+Donor (MTEF)</b>	<b>10.843</b>	<b>13.912</b>	<b>6.778</b>	<b>13.912</b>	<b>15.471</b>	<b>17.052</b>
<i>(ii) Arrears and Taxes</i>						
Arrears	0.000	0.000	0.000	0.000	N/A	N/A
Taxes**	0.700	1.200	0.000	1.200	N/A	N/A
<b>Total Budget</b>	<b>11.543</b>	<b>15.112</b>	<b>6.778</b>	<b>15.112</b>	<b>N/A</b>	<b>N/A</b>
<i>(iii) Non Tax Revenue</i>						
Grand Total	0.000	0.100	0.000	0.100	0.000	0.000
<b>Excluding Taxes, Arrears</b>	<b>10.843</b>	<b>14.012</b>	<b>6.778</b>	<b>14.012</b>	<b>15.471</b>	<b>17.052</b>

\* Donor expenditure data unavailable

\*\* Non VAT taxes on capital expenditure

The chart below shows total funding allocations to the Vote by Vote Function over the medium term:

**Chart V1.1: Medium Term Budget Projections by Vote Function (UShs Bn, Excluding Taxes, Arrears)**



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### (ii) Vote Mission Statement

The Vote's Mission Statement is:

*To catalyze the social economic transformation of Uganda and the region, through enhanced technology use. To carry out applied research and develop or source appropriate technology in order to create a strong, effective and competitive industrial Sector for the rapid industrialisation of Uganda. Hence catalyse the socio-economic transformation of Uganda and the region through enhanced technology use.*

### (iii) Vote Outputs which Contribute to Priority Sector Outcomes

The table below sets out the vote functions and outputs delivered by the vote which the sector considers as contributing most to priority sector outcomes.

**Table V1.2: Sector Outcomes, Vote Functions and Key Outputs**

Sector Outcome 1:	Sector Outcome 2:	Sector Outcome 3:
<i>A Competitive and Export-oriented Industrial Sector</i>	<i>Improved Heritage Conservation and Increased Tourism Earnings</i>	<i>Improved Competitiveness and Market Access of Uganda's Goods and Services</i>
<b>Vote Function: 06 51 Industrial Research</b>		
<i>Outputs Contributing to Outcome 1:</i>	<i>Outputs Contributing to Outcome 2:</i>	<i>Outputs Contributing to Outcome 3:</i>
<i>Outputs Provided</i>	None	<i>Outputs Provided</i>
065101 Administration		065102 Research and Development
065102 Research and Development		
065103 Industrial Incubation		
065104 Maintenance - Civil works		
065105 Maintenance - Machinery and Equipment		
065106 Student Industrial Training and Capacity Building		

## V2: Past Vote Performance and Medium Term Plans

*This section describes past and future vote performance, in terms of key vote outputs and plans to address sector policy implementation issues.*

### (i) Past and Future Planned Vote Outputs

#### 2012/13 Performance

Analysis of Vote Performance:

In the financial year 2008/09, Uganda Industrial Research Institute planned 50 New Innovations and High Value Added Products but the actual outcome was 14 and also this is not included in the vote strategic objectives. And also no exam pass rates indicated. The Institute planned 4 SME incubates, however, looking at table V3.1 (vote functions Outputs and Expenditure) the actual outturn is 25 which are good results. However, it is also not indicated among the objectives.

However, had planned 30 but no information given on number of Research undertaken to increase Targeted value addition for rural Industrialisation to reduce post harvest.

Summary of Vote Performance:

In the FY 2008/09, 25 SME's were provided with technical support in initiatives ranging from fruit juice, vegetable and meat processing, mushroom production, creative hands crafts. The institute has also undertaken maintenance of Pilot Plants at UIRI which include; Meat, Fruits and Vegetables, Handmade Paper, Ceramics, Electrical and water maintenance, ICT maintenance and also maintenance offsite projects. Also in this FY 08/09, 40 industrial trainees were admitted from different Educational

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Institutions for practical and hands on training in various disciplines, 15 Industrial trainees, 10 business incubates in Fruits and Vegetable processing bakery processing, Meat processing, Handmade paper production.

#### *Preliminary 2013/14 Performance*

The performance by end December can be categorised under the broader terms

of

1. Product Development, a range of new and improved products are under research and development, these include cosmetics, ceramics, handmade paper, baked products, juice, meat products, cow horn products, bamboo products, textile are all underway and in advance stages of development.

2. Establishment of New Castle Vaccine Production Unit where 90% of civil works and renovations of the Vaccine unit has been completed. Vaccine machinery and equipment have been procured and await delivery and installation. 9 technical staff have been recruited and training is in progress.

3. Establishment of Processing Facilities.- a) Final test running of the Potatoe and Vegetable Factory in Kabale have been completed and awaiting commencement of commercial production. b) Nabusanke women group fruit project in Mpigi has 95% civil works completed, machinery has been installed and test run. The water supply system has been installed. The project awaits commissioning and operationalisation. c) 80% civil works have been completed for a Peanutbutter project in Lira. Machinery is already procured and delivered and awaits installation d) Mushroom Training and Resource Centre MTRC has been established and is fully operational, it is benefiting a significant number of women in Kabale. e) A meat processing facility serving Easter Uganda and Western Kenya has been launched and is now operational in Busia. Support has been directed to improving its infrastructure and technical capabilities. The facility is fully operational. f) Arua agro-processing centres from mango juice processing, meat and milk processing facilities in West Nile are at different stages of development, technical support and monitoring continued and should all be operational by end 2010.

4. Technology Transfer and Engineering Innovations. Contraptions for an electric conventional oven, hatchery, textile looms, electronic equipment, software for biometric solutions are under progress.

5. Business Incubation. Varying support services have been provided and extended to in-house and virtual business incubation. Technical support to business incubation programmes has expanded beyond food processing to , vaccine production. The ultimate aim is to nurture start up businesses into reputable enterprises.

6. Skill & capacity building and Awareness & Promotional campaigns 50 staff have been trained internationally in various technical areas. UIRI's capacity to source and assess appropriate technology has thus improved significantly and the knowledge base to fabricate our own machinery has increased in similar measures. Local and regional exhibitions (In Tanzania and Sudan) have been conducted. In pursuit of addressing skills development UIRI hosted 48 industrial trainees from higher institutions of learn to expose and enable them relate theories studied in class to practical application.

7. International Collaborations various MoU's have been signed with reputable research centers, luminaries like China Bamboo Research Centre (CBRC) IN Huangzhou. SIRIM-Berhad of Shah Alum Malaysia, In October another MoU was signed with the prestigious National Science and Technology Development Agency of Thailand, our very own Makerere University. These MoUs have opened up a lot of opportunities for UIRI staff capacity building, exchanging of ideas and expansion of our horizons- for instance the fabrication of bamboo processing line in collaboration with CBRC, and also fabrication of our paper making machinery are veritable case studies in this regard

8. Infrastructural improvements and upgrading overhaul of the water system, renovations of pilot plants, construction of access gate to UIRI, new Internet Service Provider, design and construction food laboratory are all at different stages of procurement and implementation as capacity to accommodate the aforesaid initiatives and activities.

#### **Table V2.1: Past and 201/12 Key Vote Outputs\***

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<i>Vote, Vote Function Key Output</i>	<b>Approved Budget and Planned outputs</b>	<b>2013/14 Spending and Outputs Achieved by End Dec</b>	<b>2014/15 Proposed Budget and Planned Outputs</b>
<b>Vote: 110 Uganda Industrial Research Institute</b>			
<b>Vote Function: 0651 Industrial Research</b>			
<b>Output: 065101</b>	<b>Administration and Support Services</b>		
<i>Description of Outputs:</i>	Recruit 30 high caliber scientists and engineers, pay salaries & other staff benefits to 260 employees; Pay asset insurances, utility & property expenses, Clear communication and general supplies expenditures, Pay maintenance and professional services expenses	<ul style="list-style-type: none"> <li>- 4 technical staff were recruited</li> <li>- All Monthly staff salaries were paid off for Q1</li> <li>- All NSSF, PAYE, Local service tax and other statutory obligatory payments were remitted accordingly.</li> <li>- Medical insurance premium for staff and their dependants for the quarter was paid for.</li> <li>- 7 Staff were facilitated for training and skills development in the areas of</li> <li>- Property expenses were paid off.</li> <li>- Security guarding and safety of the Institute property was paid for.</li> <li>- Insurance premium for the Institutes assets which include buildings vehicles, machinery and equipment have been paid for.</li> <li>- Institute monthly utilities bills like telephone, water and electricity were paid for</li> <li>- Institute vehicles were maintained in good working mechanical condition</li> </ul>	Recruit 50 high caliber scientists and engineers, pay salaries & other staff benefits to 260 employees; Pay asset insurances, utility & property expenses, Clear communication and general supplies expenditures, Pay maintenance and professional services expenses
<i>Performance Indicators:</i>			
Payment of all utility bills, subscriptions and insurances expenses etc	100	100	100
No. of staff recruited	30	4	50
No. of staff hose salaries and benefits have been paid	260	229	280
<i>Output Cost: US\$ Bn:</i>	5.689	<i>US\$ Bn:</i> 1.329	<i>US\$ Bn:</i> 5.689
<b>Output: 065102</b>	<b>Research and Development</b>		
<i>Description of Outputs:</i>	Develop new value added products. Provide chemical, material and microbial	Research and Development - Since the selection of UIRI as a "Centre of Excellence for	Develop new value added products. Provide chemical, material and microbial

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	<p>analytical services for UIRI internal and external clients. Design and fabricate prototypes of affordable and appropriate technologies for dissemination. Initiate new project research agendas. Undertake research projects for targeted value added products to reduce post harvest loss and house hold incomes. Launch and commercialize already developed products. Commercialization and marketing of Newcastle vaccine. Operationalise established valued addition centers.</p>	<p>EAC in R&amp;D” in 2012. Strategies and proposals are being developed for implementation to as Center of Excellence of science and innovation hub for the region. Given our tentative start, a full 20 years after our peers in EAC started their R&amp;D institutions; this coming from behind win is a crowning moment for UIRI that must be activated.</p> <ul style="list-style-type: none"> <li>- UIRI has established a number of Model Value Addition Center in line with the GOU’s strategy of encouraging mass industrialization at every resource abundant area. The established facilities include but not limited to; <ul style="list-style-type: none"> <li>- Kabale Potatoe Processing Facility</li> <li>- Lira Peanut and Research Center</li> <li>- Nabusanke Fruit Juice Processing Facility</li> <li>- Arua Mango Juice Processing Facility</li> <li>- UIRI pilot plants</li> <li>- Luweero Essential Oil Pilot Project</li> <li>- Kabale Mushroom Training and Research Center</li> <li>- Busia Meat Packers</li> <li>- Mbarara Winery Processing Facility</li> </ul> </li> </ul> <p>These facilities aim to serve the country in the following ways:</p> <ul style="list-style-type: none"> <li>- Demonstration of the benefits of value addition and hence widen awareness and interest in the public.</li> <li>- We envisage a significant reduction in post-harvest loss of agricultural produce.</li> <li>- Act as hubs for knowledge and skills transfer.</li> <li>- In partnership with selected and capable private partners through business incubation develops and commercializes a range of value added products.</li> <li>- Create employment hence discourage rural-urban migration.</li> </ul>	<p>analytical services for UIRI internal and external clients. Design and fabricate prototypes of affordable and appropriate technologies for dissemination. Initiate new project research agendas. Undertake research projects for targeted value added products to reduce post harvest loss and house hold incomes. Launch and commercialize already developed products. Commercialization and marketing of Newcastle vaccine. Operationalise established valued addition centers.</p>

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		<ul style="list-style-type: none"> <li>- Work with Agricultural research institutions in developing and promoting crop varieties and animal breeds suitable for high value products and promoting crop varieties and animal breeds suitable for high value products.</li> <li>- The UIRI Essential Oil Pilot Project focuses on the development of the entire value chain. During the pilot several agronomic trial sites have been established to aid in crop selection for the varied agricultural production zones in Uganda.</li> <li>- The essential oil pilot project's establishment phase is platform that is generating data on crop yields, quality, and marketability of essential oils in Uganda. The information from the ongoing pilot will be used for future decisions in rolling out the cultivation and processing of the successful aromatic plant species in the respective agricultural production zones.</li> <li>- The first essential oils were distilled and extracted on 13th September 2013. Samples were then sent to South African Bureau of Standards (SABS). The results indicate superior compound properties determined &amp; required by the world essential oil market. Up scaling of aromatic plant cultivation of two commercial farmers is underway.</li> <li>- We have setup several industrial models for making paper, cosmetics, bamboo products, value addition to food products (dairy, meat, fruits and vegetables, bakery etc)</li> <li>- Production of a thermo-stable vaccine for Newcastle disease in poultry is for market trail and promotion. The market pilot is being conducted in twelve districts' in eastern Uganda. Plans for commercialization and establishment of a vaccine</li> </ul>	

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		<p>plant is underway</p> <ul style="list-style-type: none"> <li>- UIRI has capacity for fabrication of technologies for post-harvest agro-processing. Examples include; threshing machines, shellers, graters, multinutrient animal feed processing machines, essential oils extractors, coffee wet processing equipment, soap processing lines, etc</li> <li>- UIRI is in production of a variety of electronic equipments. At UIRI Instrumentation Divisions' Design and Printed Circuit Board (PCB) laboratories electronic equipments such as inverters, power stabilizers, power supply units, moisture meters, agricultural technologies, biomedical equipments etc are being produced.</li> <li>- Development of new products: Agricultural products such as fish, vegetables, peanuts, mushroom, honey, soya, ground nuts, milk, millet, irish potatoes, fruits, carrots, mangoes among others are turned into juice, jam, sauce, nectar, energy bars, dried fruits and other vegetable products. Procurement of materials, Bench marking and prototyping. Product quality evaluation, Recipe adjustment, Trial production and market testing for process and product refinement are under way.</li> <li>- Research and development of domestication and production of Agaricus (white button) mushroom species in Uganda is ongoing. The major objectives of this research are, Identify the most consumed Agaricus species from the wild in Uganda, Optimization of conditions for the cultivation of the edible Agaricus species in Uganda, Determination of the quantitative composition of the substrate for optimal growth of</li> </ul>	

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		<p>Agaricus Species on artificial medium in the tropics since it is mostly grown in countries with winter seasons. Establish UIRI as the storage bank of all data and mushroom seeds/spawn of all the different mushroom varieties in Uganda</p> <p>- Research and Product development and process standardization on value addition to chilies to produce Chilli oil has been completed.</p> <p>- Product development, product analysis, nutritional profiling, Process design &amp; standardization, equipment selection and package design for canned Bushere is ongoing</p> <p>- Research on value addition to Ginger to develop Ginger oil and Ginger jam is underway. Product development &amp; process standardization have been completed however shelf life study of canned Bushere is still ongoing.</p> <p>- UIRI's Chemistry Laboratory is one of the best laboratory providing testing facilities to food scientists, researchers, exporters, manufacturers, pharmacists and the general public. It continues to support research and innovation within the institute by availing testing services. Offer high quality product development and material analytical services to the private sector. It is also involved in characterization of Uganda's indigenous food products. (Vegetables-dodo, nakatti, ensugga, Biden pilosa (black jack), tumeric).</p> <p>- The chemistry laboratory carried out analysis of 205 samples from different clients</p> <p>- The chemistry laboratory undertook the analysis of Vitamin A in fortified foods on</p>	



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		<p>the Ugandan Market. Certificates of analysis were issued.</p> <ul style="list-style-type: none"> <li>- Research and development of mango fruit juice at Nile Natural Fruit Products- Arua is complete awaiting commercialization</li> <li>- The chemistry laboratory is developing high value industrial products such as sodium silicate purification. Describe chemical products technologies.</li> <li>- The chemistry laboratory provided support to product and technology development studies by private sector actors in food, mineral, and pharmaceutical industries.</li> <li>- The Microbiology laboratory continues to promote quality of products and processes aimed at ensuring compliance to the stringent market quality requirements both nationally and internationally. Through offering analytical services both in - house and to industry; which involves routine microbiological tests, targeted factory audits and advisory services.</li> <li>- The Institute has gained capacity to undertake and develop successful cosmetic production. Examples include Amagara Skin Care Products and Devia Skin Care Products. The cosmetic products are produced for different target market segments.</li> <li>- Products examined microbiologically are: water (potable and for other uses), beverages, foods &amp; feeds and non-food items like cosmetics</li> <li>- The Microbiology laboratory aims to bridge the traditional and modern knowledge systems within the innovation system. To obtain information on the traditional innovation systems or knowledge systems. To obtain information on</li> </ul>	

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		<p>traditional mechanisms of innovation and technology transfer. To determine innovation trends and the factors influencing them. To develop modalities for institutionalizing traditional innovation systems in the context of a Modern Incubator Research and Development Agency (UIRI). Undertake scientific verification of the efficacy of selected herbal remedies</p> <ul style="list-style-type: none"> <li>- Physical chemical characterization of the bark of the ficus tree.</li> <li>- There is undergoing research and development of biosensor for detection of Aflatoxin b1 in cassava flour.</li> <li>- Natural Product Research on is currently under way aimed at developing cancer chemo-preventive agents, -cholesterol lowering agent, weight loss products, anti-oxidants, anti-inflammatory agents, wound healing products, detoxifiers.</li> <li>- The Instrumentation Unit at UIRI is involved in developing Biomedical Monitoring System device used to measure heart rate in beats per minute (BPM) and Blood Oxygen saturation (SPO2).</li> <li>- Development of microcontroller based physics lab equipment. Incorporation of intelligence in exiting equipment.</li> <li>- Intravenous (IV) Automated Regulator device used to automatically monitor and regulate intravenous drug delivery</li> <li>- Indoor/Outdoor Automatic Lighting Control System - device used to automatically turn on/off light to save energy</li> <li>- Finger Print based Security System- microcontroller based project that uses fingerprint authentication to grant access to</li> </ul>	

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		<p>registered users</p> <ul style="list-style-type: none"> <li>- Design and production of microcontroller based systems and products</li> <li>- Automated Solar Tracking System – optimizes the absorption of sun rays through an electro-mechanical system that follows the movement of the sun.</li> <li>- Autonomous Plant Health Sensor System – device used to monitor principle parameters in and around a plant (gardens/farms)</li> <li>- Strengthening linkages between traditional and modern knowledge systems for social inclusion.</li> </ul> <p>Under the Ceramics, Material and Mineral beneficiation department, the following were undertaken during Q1;</p> <ul style="list-style-type: none"> <li>- 5 mineral samples from clients were analyzed for Mineral Physical property tests and Material performance. Chemical analysis &amp; project reports were compiled and certificates were issued.</li> <li>- 5 final product tests were carried out for Dustless chalk and the Low firing glaze developed was successfully tested. Processed Glazed &amp; chalk were packaged. Testing of other developed products include Porcelain, Red Oxide and Tile adhesives</li> <li>- 3 analytical tests on the raw materials to establish the right body formulations were conducted. Product formulations were successfully obtained.</li> <li>- 5 raw material sources were established and generate scientific data about the raw material properties were acquired by data analysis. Research for project design and formulation are underway.</li> </ul>	
<i>Performance Indicators:</i>			
No. of research projects undertaken to increase	30	8	35

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targeted value addition for rural industrialisation to reduce post harvest loss.			
No. of research projects initiated and underway	50	12	55
No. of new innovations and value added products developed	45	15	50
<i>Output Cost: US\$ Bn:</i>	<i>1.872</i>	<i>US\$ Bn: 0.491</i>	<i>US\$ Bn: 1.672</i>
<b>Output: 065103</b>	<b>Industrial and technological Incubation</b>		
<i>Description of Outputs:</i>	Expand the UIRI Industrial and Technological Business Incubation portfolio. Extend support to business incubation and MSME. Promote and create awareness of new products by SME's, Develop business management skills through ICT applications. Train MSMS in product formulation, skills development and capacity building.	UIRI is operating a vibrant business incubator which has offered a cocktail of services to various incubatees. Products from the research and development projects are piloted and commercially tested in partnership with the private sector. These entrepreneurs are supported to commercialize these products through the industrial and technological incubation program. The support includes but not limited to: <ul style="list-style-type: none"> <li>- Different producers seek technical guidance in form of information regarding;</li> <li>- Product formulations</li> <li>- Quality improvement</li> <li>- Process optimization</li> <li>- Storage and usage .</li> </ul> Support to the industrial and technological business incubation program include <ul style="list-style-type: none"> <li>- Commercialization of the successfully developed fish and vegetable sausages and snack.</li> <li>- Up scaling of aromatic plant cultivation of two commercial farmers is underway</li> <li>- UIRI has have setup several industrial models for making paper, cosmetics, bakery products, dairy processing, meat packaging systems</li> <li>- Market research and product promotion for peanut butter products, produced at Lira Peanut Research and processing center is ongoing</li> <li>- UIRI supported a number of research facilities which include; Mbarara winery facility, Arua and Nabusanke</li> </ul>	Expand the UIRI Industrial and Technological Business Incubation portfolio. Extend support to business incubation and MSME. Promote and create awareness of new products by SME's, Develop business management skills through ICT applications. Train MSMS in product formulation, skills development and capacity building.

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		fruit processing plants, peanut processing facility in Lira, potato processing facility in Kabale, the mushroom training and research Centre in Kabale, among others - The Instrumentation Division continues to support Dr. Mwanje's projects with microcontroller based development of the following E-tech equipment: Battery tester, Signal generators, and the grain moisture meter. - UIRI has a portfolio of 61 active incubates	
<i>Performance Indicators:</i>			
No. of technologies deployed with incubatees	15	6	20
No. of SME's created through incubation	40	11	45
No. of industrial Incubatees taken on	15	5	20
<i>Output Cost: US\$ Bn:</i>	<i>1.563</i>	<i>US\$ Bn: 0.326</i>	<i>US\$ Bn: 1.547</i>
<b>Output: 065104</b>	<b>Model Value Addition Centre Establishment</b>		
<i>Description of Outputs:</i>	Establish and equip value additional centers in regions of target raw material. Operatonalise value addition centers to stimulate farmer raw material as the centers would provide ready market for their produce.	- The Institute undertakes routine planned maintenance and continuous repair and servicing of machinery, equipment, electrical, plumbing, water pipe networks, infrastructure at UIRI on-site facilities and the offsite established Model value addition facilities at - Kabale Potato Processing Facility - Lira Peanut and Research Center - Nabusanke Fruit Juice Processing Facility - Arua Mango Juice Processing Facility - UIRI pilot plants - Luweero Essential Oil Pilot Project - Kabale Mushroom Training and Research Center - Busia Meat Packers - Mbarara Winery Processing Facility requires continuous maintenance and management. - During the quarter there was repair and maintenance of machines with faulty electronic	Establish and equip value additional centers in regions of target raw material. Operatonalise value addition centers to stimulate farmer raw material as the centers would provide ready market for their produce.

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		circuits on UIRI campus - The blown heating elements for the pasteurizer in the Juice Plant were repaired and replaced - Serviced the prover and repaired the baking oven - Repaired the bamboo splitting machine - Repaired underground water pipe network - Repaired, adjusted and run the canning machine for increased value addition and production of cow-horn products - Acquired electrical materials for conduiting, wiring equipment, termination, cabling and running of meat machines at Mbale Meat Plant - The Instrumentation Team continuously works on several electrical and electronic faults in equipment around the UIRI campus, all this work is documented in an equipment fault log and a detailed report is available every quarter and most faults have been successfully repaired, those that haven't require specific parts that take time to procure. - Designs for the remodeling of the chemistry laboratory to conform to the requirements of ISO 17025 is underway - Designs to renovate the floor for Hand made paper pilot plant are underway - Acquired and installed a sink at the cosmetics production unit - Acquired workshop tools and accessories identified and for lockup fabrication to promote local entrepreneurs - 1 HPLC was repaired for analysis of Micronutrients in food.	
<i>Performance Indicators:</i>			
No. of products up-scaled and commercialized by the centres	25	6	30
No. of model value addition centres established	5	2	2
No. of local raw materials developed and populated in the scientific databases	35	12	40

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<i>Output Cost: US\$ Bn:</i>	0.480	<i>US\$ Bn:</i> 0.108	<i>US\$ Bn:</i> 0.519
<b>Output: 065105</b>	<b>Facility Repair and Maintenance</b>		
<i>Description of Outputs:</i>	Continued preventative / routine maintenance, upgrades of system and servicing of unplanned break downs. These include machinery equipment, of electrical system, water and drainage, cold rooms, air conditioners. Replacements and refabrication of parts.	<ul style="list-style-type: none"> <li>- The Institute undertakes routine planned maintenance and continuous repair and servicing of machinery, equipment, electrical, plumbing, water pipe networks, infrastructure at UIRI on-site facilities and the offsite established Model value addition facilities at <ul style="list-style-type: none"> <li>- Kabale Potato Processing Facility</li> <li>- Lira Peanut and Research Center</li> <li>- Nabusanke Fruit Juice Processing Facility</li> <li>- Arua Mango Juice Processing Facility</li> <li>- UIRI pilot plants</li> <li>- Luweero Essential Oil Pilot Project</li> <li>- Kabale Mushroom Training and Research Center</li> <li>- Busia Meat Packers</li> <li>- Mbarara Winery Processing Facility requires continuous maintenance and management.</li> </ul> </li> <li>- During the quarter there was repair and maintenance of machines with faulty electronic circuits on UIRI campus</li> <li>- The blown heating elements for the pasteurizer in the Juice Plant were repaired and replaced</li> <li>- Serviced the prover and repaired the baking oven</li> <li>- Repaired the bamboo splitting machine</li> <li>- Repaired underground water pipe network</li> <li>- Repaired, adjusted and run the canning machine for increased value addition and production of cow-horn products</li> <li>- Acquired electrical materials for conduiting, wiring equipment, termination, cabling and running of meat machines at Mbale Meat Plant</li> <li>- The Instrumentation Team continuously works on several electrical and electronic faults in equipment around the UIRI campus, all this work is</li> </ul>	Continued preventative / routine maintenance, upgrades of technologies, system and servicing of unplanned break downs. These include machinery equipment, of electrical system, water and drainage, cold rooms, air conditioners. Replacements and refabrication of parts.

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

<i>Vote, Vote Function Key Output</i>	<b>Approved Budget and Planned outputs</b>	<b>2013/14 Spending and Outputs Achieved by End Dec</b>	<b>2014/15 Proposed Budget and Planned Outputs</b>
		documented in an equipment fault log and a detailed report is available every quarter and most faults have been successfully repaired, those that haven't require specific parts that take time to procure. - Designs for the remodeling of the chemistry laboratory to conform to the requirements of ISO 17025 is underway - Designs to renovate the floor for Handmade paper pilot plant are underway - Acquired and installed a sink at the cosmetics production unit - Acquired workshop tools and accessories identified and for lockup fabrication to promote local entrepreneurs - 1 HPLC was repaired for analysis of Micronutrients in food	
<i>Performance Indicators:</i>			
No. of technologies applied to reduce utility costs	25	7	30
No. of on-site machines and equipment maintained	180	55	210
No. of off-site pilot plants maintained	25	9	30
	<i>Output Cost: US\$ Bn:</i>	<i>0.492</i>	<i>US\$ Bn:</i>
		<i>US\$ Bn:</i>	<i>0.143</i>
			<i>US\$ Bn:</i>
			<i>0.492</i>
<b>Output:065106</b>	<b>Industrial Skills Development and Capacity Building</b>		
<i>Description of Outputs:</i>	The Institute's Business Development Centre (BDC) aims at training more than 1,200 people on use of ICT for business development. Clients have included SMEs, UIRI incubatees, staffs from other institutions and members of the public.	- UIRI has become a popular destination for students seeking industrial training. UIRI offered 97 placing to continuing university students for the period of July to September for industrial training especially to students in the field of science and engineering. They gain practical and hands on experience and can relate their experience to the theoretical knowledge acquired in class. - The chemistry laboratory has offered training to 25 Laboratory Professionals In ECSA Region In Testing Of Micronutrients In Food - The Business Development Center trained 202 people in different computer applications aimed at business management. - 50 Scientists in Industries i.e.	The Institutes Industrial Skills and Capacity development includes internship programs, industrial training for university continuing students, staff trainings for skills upgrading and enhancement of new evolving technologies. It also includes production trainings in various food processing fields and engineering technics for potential entrepreneurs



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## Vote Summary

<i>Vote, Vote Function Key Output</i>	<b>Approved Budget and Planned outputs</b>	<b>2013/14 Spending and Outputs Achieved by End Dec</b>	<b>2014/15 Proposed Budget and Planned Outputs</b>
		<p>Mukwano , Maganjo millers, Mukono Oil Industry, Nile Agro Industries, Ntake Millers, Unga Millers were trained in GLP and fortification of foods with micro-nutrients by the UIRI Chemists</p> <ul style="list-style-type: none"> <li>- 250 students from Makerere, Kyambogo universities have had hands on chemical analysis training</li> <li>- 35 successfully had practical and hands on training in food product development and prototyping</li> <li>- 8 university students from Makerere &amp; Kyambogo were trained by staff of UIRI Chemistry Laboratory in Good Laboratory Practices ( GLP)</li> <li>- 65 students (30 UPIK students &amp; 35 Mulago Allied Health Science Institute) had hands on training in chemical analysis of products such as food, water and other products of different batches and types are analyzed to check their quality uniformity and to check if they are all meeting the required quality standards.</li> <li>- These tests are routinely done to establish a quality system for particular products.</li> <li>- Chemistry laboratory also trains -food scientists, laboratory analyst, NGOs, university students, entrepreneurs in analysis of micro-nutrients in foods</li> <li>- A group of 7 Women from Eastern African Sub-regional Support Initiative for the Advancement of women (EASSI) an NGO in cowhorn processing had hands on training in cow horn processing.</li> <li>- 8 students pursuing Bachelor of Science Degree in conservation forestry and product technology at Makerere University had hands on training in carpentry and Joinery for 3 weeks and each student completed an office chair</li> <li>- The ceramics department offered training in general</li> </ul>	

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## Vote Summary

<i>Vote, Vote Function Key Output</i>	<b>Approved Budget and Planned outputs</b>	<b>2013/14 Spending and Outputs Achieved by End Dec</b>	<b>2014/15 Proposed Budget and Planned Outputs</b>
		<p>ceramics technology to university students and master program students</p> <ul style="list-style-type: none"> <li>- The Instrumentation unit trains university continuing students, Entrepreneurs and other targeted groups.</li> <li>- The trainings include Workshop practice, Circuit design and analysis, Breadboards, troubleshooting and testing circuits. Computer Aided Design. PCB Manufacturing process. Embedded Systems</li> <li>- Train university students technicians and professionals in the field of electronics</li> <li>- The Instrumentation unit also provide technical consultation services to individuals, companies and organizations in the field of electronics</li> <li>- Paper department conducted training in market access and value addition to alternative agricultural fibres</li> <li>- Publication of training manual, flyers and designing business to business models for fibre processing technologies from the producers to consumers</li> <li>- Sensitization and organizing demonstrations for banana farmers</li> <li>- Food scientists, laboratory analyst, Chemical analysts, Researchers, university students, NGOs were trained in analysis of micro-nutrients in foods</li> <li>- One UIRI employee EM Technology</li> <li>- Practical training in Nairobi product development complete, Samples developed activity ongoing commercialization of technology</li> <li>- One employee participated at the AgriLASA evaluation meeting</li> <li>- Two employees have trained in ISO 17025</li> <li>- Two employees trained in ISO 9000:2005- Quality management system</li> <li>- One employee attained</li> </ul>	

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## Vote Summary

<i>Vote, Vote Function Key Output</i>	<b>Approved Budget and Planned outputs</b>	<b>2013/14 Spending and Outputs Achieved by End Dec</b>	<b>2014/15 Proposed Budget and Planned Outputs</b>
		training in Lipary (Stone cutting) Technology - Dar es Salaam TZ - One paper employee attended the African business innovation awards in Newyork, and the ANAFE Fair (Linking Research Institutions, Universities and private sector in Africa) and in Nairobi respectively - One employee attained EM Technology practical training in Nairobi. Product development and samples by use of EM Technology is complete - Two employees attained training in Advanced Human Resource Management form Galilee Management Institute.	
<i>Performance Indicators:</i>			
No. of industrial trainees taken on from higher institutions of learning	120	97	900
No. of apprentices taken for increased capacity in technology use and application	60	441	70
<i>Output Cost: US\$ Bn:</i>	<i>0.121</i>	<i>US\$ Bn: 0.030</i>	<i>US\$ Bn: 0.121</i>
<b>Vote Function Cost</b>	<b>US\$ Bn: 15.212</b>	<b>US\$ Bn: 6.778</b>	<b>US\$ Bn: 14.012</b>
<b>Cost of Vote Services:</b>	<b>US\$ Bn: 14.012</b>	<b>US\$ Bn: 6.778</b>	<b>US\$ Bn: 14.012</b>

\* Excluding Taxes and Arrears

### 2014/15 Planned Outputs

1. Establishment of a Regional Hub for Science, Technology, and Innovations (STI) in East and Central Africa in support of industrialization of EAC states.

Following the award of UIRI as Center of Excellence in R&D for the East African Region on 30th November 2013.

The Institute will in FY 2014/15 undertake feasibility plans and activities aimed at establishing a Regional Hub for Science, Technology, and Innovations (STI) in East and Central Africa in support of industrialization of EAC states.

The project will majorly focus on Research and Technological Organizations (RTOs) and Industrial Research Institutes and other agencies involved in technological aspects of Industrialization.

The objectives of establishing a Regional Hub for Science, Technology, and Innovations (STI) will be to harness, coordinate, and harmonize the collective efforts of regional governments and their respective agencies involved in the industrialization process. To complement the efforts and resources committed by the EAC secretariat in advancing industrialization of the sub-region. To share UIRI's experiences with research institutes on how to build a viable and respectable R&D institution.

The rationale is that at Uganda's Independence Jubilee last year, His Excellency Yoweri K Museveni

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identified ten strategic bottlenecks that have been cause and consequences of Uganda's slow pace towards modernity. Included in the list is "Lack of industrialization." Indeed robust industrialization is the catch-all for solving most of our development ills.

In turn, industrial research institutes and RTOs are the fuel that fires the engines of socio-economic transformation.

The proposed project is aimed at the following:

- Coordinate, facilitate, and foster activities that will lead to efficient and effective delivery of services by the regional RTOs to the industrialization process.
- Enhance capacity for scientific innovations and create pathways and platforms for their implementation and application.

- Establish a regional hub for scientific and technological innovations.

- Plug the gaps within the agribusiness value chains by enhancing technology use in value addition.

The scope requires individual countries within EAC and their neighbors all subscribe to the same rhetoric regarding development, socio-economic transformation, et al. But their funding priorities tend to belie these sentiments. For example their commitments to invest in R&D have not been fulfilled. 1% of GDP for each member should be allocated to R&D.

Individual countries have made attempts to establish RTOs, e.g. UIRI; KIRDI, TIRDO. However, unlike their agricultural research counter parts; these RTOs are limping because of traditionally inadequate facilitation. There is palpable ambivalence about funding of RTOs in our region.

The proposed project will, among other things, strive to provide a forum for exchange of ideas, sharing of experiences, and mutual mapping of strategies for R&D activities, especially those related to industrialization.

Participating Institutions; with UIRI taking the coordinating lead, sister organizations in the region will form the core of the envisaged hub. These include: KIRDI; TIRDO; TEMDO; etc

UIRI stands ready to assist the member states of EAC which don't yet have similar RTOs, to establish them.

UIRI is already active with peer organizations globally. Our association with the likes of SIRIM, FARA, and CSIR will help to assure the success of this project.

UIRI remains committed to fulfill its mandate and objectives during FY 2014/2015. The Institute's competence shall be availed to undertake the following projects/activities;

2. Establishment of Model Agro- Processing facilities as per National agricultural zoning of resource abundant areas. These will act as

- Hubs for knowledge and skills transfer.
- Envisaged significant reduction in post-harvest loss of agricultural produce.
- The agro processing facilities will stimulate increased agricultural raw material and farm production for primary industry
- Work with Agricultural research institutions in developing and promoting crop varieties and animal breeds suitable for high value products and promoting crop varieties and animal breeds suitable for high value products.
- Demonstration of the benefits of value addition and hence widen awareness and interest in the public.
- Establish platforms for value addition and product development

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### 3. Commercialization of essential oil

UIRI and under the technical guidance of Council for Scientific and Industrial Research - Enterprise Creation for Development (ECD) of South Africa has established an essential oil pilot project in Uganda consisting of five suitably selected essential oil varieties. The project will provide information on crop yields as well as the quality and marketability of the essential oils that are steam distilled from the harvested plants. The information is required for future decisions on the economic viability of cultivating and processing essential oil plant species for commercial purposes in Uganda. Design Phase (Phase I) and the Establishment Phase (Phase II) have already been completed. The Pilot Operation Phase (Phase III) is underway. Full Operation (Phase IV) and Close Out (Phase V) shall be undertaken in FY 2014/15. The major objective of the project is to inform the processes and procedures to the development of Essential Oil Sector in Uganda.

### 4. Establishment of a foundry

The Institute urgently needs to establish a foundry for “total technology development” capability, for competence reverse engineering of basic technologies for industrial application and production of spare parts. Currently limited fabrications of basic machine parts. Others more complex parts (gears, blocks, motor casting) can only be done by foundry casting our limited ability in reverse engineering the Bamboo line is a good example. With a foundry we can replicate the entire line

### 5. Cosmetics formulation and training

This is a research, development, and popularization project for soaps and cosmetic products with an organic foot print. Under this project entrepreneurs are trained in cosmetics production techniques, and technically supported to formulate and develop different products for commercial purposes. In addition to supporting different entrepreneurs, the project aims to develop and standardize two products in the next financial year (2014-2015):

- A Shea butter /Bentonate based anti-Acne cream, and
- An antimicrobial soap

Shea nut or moo yaa grows naturally in Sahel region of North Eastern Uganda, and bentonite is a mineral that occurs in Kasese and Mbale regions of Uganda. These two have very beneficial quality attributes for skin which enhance product acceptability

### 6. Research & development of Spirulina

This project aims at development and production of Spirulina, edible high protein blue - green algae.

### 7. Research & Development of Actinomycin D (Anti-cancer chemotherapeutic drug)

This project undertaken by Kess Biotechnology & UIRI, aims to develop cheap and readily available anti-cancer drug (Actinomycin D). The strains producing the drug have already been isolated and are being in the biotechnology center of excellence.

### 8. Development and application of a bacterial system for the production of industrial biocatalysts.

This project is being undertaken by AMiTek (Applied Microbial Tekinologies) in collaboration with UIRI for the production of industrial biocatalysts (Enzymes); initially proteases to be used in cleaning agents and as food additives. The strains of bacteria have already been isolated

### 9. Research & development of an antibacterial herbal remedy

Under this project, selected herbal remedies have been scientifically tested and verified to be efficacious. In the next financial year, it is planned to design and develop a production process for herbal ear-drops thereby establishing a model value addition centre to commercialize our natural herbs in Kamuli district of Uganda.

### 10. Research and development of a biosensor for aflatoxin testing

The project to develop the technology resulted from the demand for a hand-held tool for demonstrating

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safety from aflatoxin B1 in agricultural products specifically fermented cassava products that are traded within the East African Region in Arua, Tororo and Busia Districts of Uganda. The scientific principle and electronics have been developed and are being validated by comparison with existing standard techniques. During the next year we envisage to prototype; assemble the biosensor; study environmental stability; and do performance testing in the field. When complete this tool will enhance regional trade

#### 11. Establishment of Ugandan Shea processing Platform

The project is aimed at strategic development of shea butter and oil processing to enhancing market access. Although the product is high value, market access has been impeded due to poor quality products. A model value addition center will be established and processors shall be trained in good manufacturing practices for development of competitive shea butter products in the region.

#### 12. Minerals and material engineering section

The section aims to undertake physical and chemical analysis of different mineral ores used for development and production of

- Cups, Plates and saucers
- R&D in Bentonite and Allied
- R&D in Artificial Ceramic Corals in fish breeding
- R&D in Gemstone cutting technology
- R&D in Water filtration
- Concrete tiles and Pavers
- Production of oxides
- Manufacture of adhesives

#### 13. Food product development

The food laboratory shall engage in research and development of different food formulations and product development of products including but not limited to

- Development of breakfast cereals, instant porridges, noodles from local foods like cassava and sweet potato
- Package foods including meats, fruits, vegetables, baked products using modified atmosphere packaging (MAP) as a preservation procedure that doesn't use chemicals
- Producing pectin from fruit wastes, extraction of plant and animal materials that can be used as ingredients during product development.
- Undertake activities for laboratory accreditation

#### 14. Research and Development of Agriculture based projects:

- Smart Drip Irrigation System

Uganda is said to be the food basket of the Africa and that her economy relies heavily on Agriculture. However, we see that this is being threatened by the continual unpredictable weather patterns among other factors. This thus merits that irrigation is adopted as a means to supplement the unreliable rains. It's from is background that the Instrumentation team has embarked upon designing a Smart Drip Irrigation System to mitigate this challenge. The irrigation system under design will not only reduce wastage of water but will also provide for soil moisture and Ph monitoring, fertilization, and a crop database.

#### 15. Neonatal and Maternal Healthcare projects:

- Automated Intravenous Fluid Delivery Regulator

Intravenous Fluid delivery is a medical procedure which is carried out to either quickly replenish fluids in the body or/and administer drugs through a tube known as a catheter inserted into the body. This life saving procedure can become very dangerous and possibly fatal if the fluid flow is not correctly regulated especially for infants and young children. High volumes of a fluid administered in a very short time results into drug overdose and heart overload which escalates into heart failure. Furthermore, high flow rates of a

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fluid damages blood vessels at the point of insertion.

It's from this background that the Instrumentation Division embarked on design of an Automated Intravenous Fluid Delivery Regulator which will render fluid flow rate control a function of volume to be administered for a particular time period. The device will also provide for occlusion detection, fluid run-away and near-empty detection with an alert/ alarm system.

#### 16.MUTIMA project (Heart rate and Blood oxygen saturation monitoring)

According to the Uganda demographic and health survey 2011, low levels of haemoglobin in blood decreases the amount of oxygen reaching the tissues and organs of the body and reduces their capacity to function normally. This is associated with impaired cognitive and motor development in children. This condition can be avoided if early detection is made. Other medical conditions such as hypoxemia and sickle cell also result into low blood oxygen. Also, heart rate measurement and monitoring is a vital tool in diagnosis and treatment of cardiovascular related diseases, heart attacks, stroke and heart failures. These, once foreign diseases are now on the increase in Africa. Early detection of such conditions is thus vital for life to be sustained. The development of the Mutima project is therefore to facilitate monitoring of blood oxygen saturation and heart rate through the use of non-invasive methods.

#### 17.Mother's baby thermometer project

The Mother's baby thermometer project is set out to design and develop a non-invasive miniature thermometer for mothers at home to monitor the temperature of their babies at critical stages of growth so as to allow them make urgent and informed decisions about their baby's state of health especially Fever onsets in Rural Uganda. The onset of fevers (high body temperatures) in most cases is a common indicator of infection in neonates. Since an infant's immune system is not fully developed, they are vulnerable to infections thus this will go a long way to enable mothers monitor the health of their baby.

#### 18.Energy Efficiency projects :

##### Temperature Measurement and Control device

Manufacturing Industries and Production plants often have critical processes in which proper temperature regulation/ control is a prerequisite for a quality product to be produced. As such, this device is designed to be retrofitted on an existing system or customized to solve a specific temperature control and/or monitoring problem. This system can be used to control and monitor room temperature, incubator temperature, electrical oven temperature, water heater temperature, dryer temperature, kilns and furnace temperature among other things.

##### 19.Solar Powered Chicken Eggs Incubator

This Incubator is designed to allow farmers to hatch chicken eggs using a method that requires minimal energy and is self-regulating. Uganda receives plenty of solar energy which can be harnessed to reduce reliance on hydro and thermal electricity. For farmers who have hens that are not ready to net or/and for large chicken raising facilities, and for researchers/students, this method provides green-energy and cost effective solutions.

##### 20.Control System projects – Interactive Traffic Light Control System Project

In Uganda, the sequence in which a set of traffic lights at a junction is turned on has a fixed delay period regardless of the volume of traffic at the intersections thus underutilization of the roads and unnecessary increased delays. The interactive traffic light control system under development takes this into consideration and provides a platform through which the delay periods for each set of lights at the intersection can be varied.

##### 21.Security applications

##### Fingerprint and Pin code Based Security Access Control System

Access control systems have over time become more sophisticated and several security measures have been employed to combat the menace of insecurity of lives and property. This can be done by preventing

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unauthorized entrance into buildings using conventional and electromagnetic security door locks, discrete access codes, and biometric methods such as finger prints, the eye and facial recognition. Security systems having realized the value of biometrics to verify or identify users, it has become the most secure and convenient authentication tool used today. This is because it cannot easily be borrowed, stolen, or forgotten and forged.

This project deals with identification, authentication, discrete access code and setup of a security system

### 22.Measurement applications

#### Digital Weighing Scale design (Reverse engineering )

Weighing scales have found numerous applications in the field of Medicine, Agriculture, Production, Trade, and Education among others. In some of these, precision is an important factor and the line between good quality and poor quality may be a small change in weigh measurement. The cost of these scales is also very high and as such is not affordable. Basing on these factors, the design of this device will mitigate some of these problems.

### 23.Instrumentation, Control and Automation projects

#### Automation of weaving machines (Bomboo section UIRI)

Weaving is one of the income earners for many women in Uganda and yet, most of these methods and tools used are rudimentary as such, the turnover is very low and labour intensive. Therefore, as a means to maximize profits, reduce on the labour demands, and increase throughput, the Instrumentation Division is set out to automate the weaving machine at UIRI as case study.

### 24.Moisture meter for wood.

The measurement of moisture content has proved to be a big challenge for dealers in wood and the end-users i.e. the carpenters. As such, wood decay, infection by pests and poor quality products have resulted into huge loss of money and market for wood products since these persons cannot measure the moisture content in their wood. In addition the price of a wood moisture meter is too high and unaffordable by many. It is from this background that the device will be developed to mitigate these challenges.

### 25.Design and development of a Sterilizer

Sterilizers are instruments that are used to disinfect a number of tools and raw materials in the medical sector, and food technology sector among others. Failure to sterilize may result into fatal contamination, infections and erroneous experimental results. Even though this procedure is mandatory many health facilities and food labs are inadequately stocked hence posing threat to lives. The design and development of this instrument will fill this gap.

### 26.Industrial And Technological Incubation

UIRI operates an Industrial and Technological Incubator program. The incubator program has grown into a vibrant, robust and competent platform that sets up and hand holds enterprises to self-sustainability. Its portfolio continues to grow from strength to strength. The Institute supports both in-house incubates and virtual incubates at different levels of operation.

All innovations and value added products developed at the Institute are positioned for incubation by the private sector. Functions of the UIRI Incubator program include:

- Nurturing and growing start-up agribusiness enterprises,
- Training in application of best practices, international standards of management and enhanced work ethic for indigenous enterprises,
- Mentoring and cultivating other professional business management practices.
- Practical trainings in business managerial competence, book keeping and business discipline.
- Trainings in principles of technology acquisition, deployment and diffusion.

### 27.Upgrading of technologies, procurement of new technologies, machinery and equipment for the following areas

#### Technology development center

- Machinery and equipment for the Foundry



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### •Technologies for the foundry

Vaccine production unit

### •Incubator for the Vaccine Production Unit

Bakery

### •Four Deck Baking Oven i.e. used for baking especially cakes

### •Dough Mixer (75kg dough capacity) to be used for mixing dough of up to 75kg

### •Extruder to be used for making instant breakfast cereals e.g. cornflakes and pet foods

### •Other small equipment/tools needed for Chocolate Making Project

Essential oil project

### •Agri-weave technology

### •500kg Essential Oil distillation unit

### •Irrigation Systems

### •Purchase nursery inputs

### •Renew organic certification services for essential oil project

Chemistry laboratory

### •Soxtec system (Fat content), Fiber Tec system(fiber content) & Kjel-tec system (protein)

### •Procurement of Laboratory Analytical Balance

### •Procurement of Gas Chromatography/ Mass spectrometer (GC-MS) equipment

### •10 Analytical Chemistry & Laboratory text books

Instrumentation division

### •3D rapid prototyping printer

### •Light Intensity meter

### •Air Flow rate meter(Anemometer)

### •Pressure meter/Manometer

### •Hygro-Thermometer

### •Power supply with variable negative range

### •Reflow ovens

### •Drilling machine(handheld)

### •Drilling machine(bench machine)

### •Printer/Scanner/Copier, Computer (to be handled by ICT)

### •Logic Analyzer

### •Moisture meter

### •Clamp meter

### •Multi-meter

### •Documenting Process Calibrator

Food laboratory

### •Lines of various food processing equipment

### •MAP packaging technology

### •Extrusion technology

### •Separation technology

Bakery

### •Deluxe Professional Airbrush Cake Decorating System

### •Infrared Thermometer

### •Countertop Microwave Oven

### •Polycarbonate Chocolate Moulds

### •Silicone Scoop Shovel Scrapper Rabbler Multipurpose Spreader (pack of 3)

### •Spoon Shaped Silicone Spatula Scrapper

### •Fondant modeling Set

### •Table Top Tempera

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- Bench Scraper(large)
- Bench Scraper (Medium)
- Offset Spatula
- Pastry Scraper
- Multi-purpose Bowl Scraper
- Chocolate Shaver
- Chocolate Decorating Comb and Smoother (4"x6")
- Ladle (½ oz)
- Chocolate Dipping Tool Set
- Chocolate Dipping Tool Basket
- Mixing Bowl (4 quart)
- Double Boiler Insert 8 Cup Capacity
- Non-Stick Chocolate Bark Mold & Baker's Quarter Sheet
- Silicone Non-stick Baking Sheets
- White Marble Superfine Grain Slab
- Hot Air Gun
- Aluminum Chocolate Wrapping foil

### Meat technology

- Ice Flake Machine 500 Kgs/ 24 Hrs
- Sausage Filler 30 Lt
- Blast Freezer 4m X 4m Min Temp -18 Degrees
- Band Saw Free Standing
- Brine Injector

### Dairy technology

- Aluminum Milk Cans (50 Litre Capacity) - 50 Pieces
- Manual Cup Sealers - 3 Pieces
- Heavy Duty Plastic Crates - 200 pieces
- Positive Displacement Pump - 1 unit

On- Line milk filter - 1 unit

Automatic Vertical Form, fill & Seal Packaging Machine

Small Scale Dairy Processing Equipment

Lira Peanut and Research Center

- Peanut grinder for grinding ground nuts into peanut butter. This will enable us meet the demand because we roast a lot but the current grinder has a low capacity compared to the roasted capacity
- Generator is need especially when there is load shedding there is no other way to push ground nuts out of the roaster or cooler. All the big losses we have had are attributed to this.
- Compressor to deliver compressed air to filling machine for automatic filling
- Sachet packing machine for filling Peanut butter into sachets
- Welding machine for joining/welding processing machinery together especially during maintenance
- Laboratory Centrifuge
- Moisture analyzer
- Analytical balance
- Laboratory Oven
- Laboratory Blender

28.Maintenance of UIRI technologies, machinery and equipment

Maintenance of pilot plant equipment for efficiency and productivity

Bakery and cereal processing plant require Lubricants and grease, wear spare parts.

The (Ceramics) mineral and material laboratory require complete overhaul. Meat production and training,

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Fruits and vegetables production plant, Dairy technology section (Fresh Milk, Yoghurt and Ice Cream) require Cold room maintenance and preventative /routine serving consumables like oils, lubricants, wear spares,

Food, Chemical, microbiology and biotechnology analytical labs require fridges services, electrical fittings and gas filling.

Maintenance of engineering shops requires acquisition of spares, tools, consumables, components and controls, service and maintains the plants

Maintenance of satellite projects (Arua fruit Juice, Mbale meat processing facility, Lira Peanut Processing and Research Centre, Nabusanke fruit Juice, and Kabale potato and bamboo plants) require acquisition of spares, tools, consumables, components and controls, for service and maintenance

Refurbishment and remodelling of existing infrastructure at UIRI to include

Applying Epoxy floor finish to TDC workshop floors

Repair of UIRI pilot plants roofs

Modify roof free of leakages steel trusses, new iron sheets, roof drainage

Replacement of internal water distribution systems

Waste water treatment Maintenance materials

Periodic maintenance of UIRI buildings. These include painting works, minor repairs and roof cleaning

Repairing of High Performance Liquid Chromatography (HPLC), Atomic Absorption Spectrophotometer (AAS)

Repair of Microwave Digester (Multi-wave 3000),

Repair of Laboratory Refrigerator (EkoFrigoLab 1500) and Freeze Dryer (Telstar LyoAlfa 6)

Preventive maintenance for HPLC (2), AAS, CHN, and Uv/visible Spectrometer Preventive

Maintenance/service & labour, Air ticket(Experts from Egypt)

Remodelling of the chemistry laboratory

Calibration of Analytical balance, 2 ovens, 2 muffle furnace, water bath & Ph meter

General servicing and repairs of bakery pilot plant equipment. Spare parts for repair of dough mixer, rotary oven, bun divider, cake mixer, digital weighing scales & dough sheeter

Routine servicing, maintenance and repair of meat technology equipment's

Preventive Maintenance, Break down repairs Engineering machinery and equipment

Routine servicing, maintenance and repair of bamboo technology equipment's

Plant preventive maintenance for both Bamboo plants

Hygienic maintenance of all food pilot plants, estates& Bamboo pilot plant

Maintenance of UIRI Servers

**Table V2.2: Past and Medum Term Key Vote Output Indicators\***

Vote Function Key Output Indicators and Costs:	2012/13 Outturn	2013/14 Approved Plan	Outturn by End Dec	MTEF Projections		
				2014/15	2015/16	2016/17
<b>Vote: 110 Uganda Industrial Research Institute</b>						
<b>Vote Function:0651 Industrial Research</b>						
No. of staff hose salaries and benefits have been paid		260	229	280	300	320
No. of staff recruited		30	4	50	20	20
Payment of all utility bills, subscriptions and insurances expenses etc		100	100	100	100	100
No. of new innovations and value added products developed		45	15	50	55	60
No. of research projects initiated and underway		50	12	55	60	65
No. of research projects undertaken		30	8	35	40	45

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

Vote Function Key Output Indicators and Costs:	2012/13 Outturn	2013/14 Approved Plan	Outturn by End Dec	MTEF Projections		
				2014/15	2015/16	2016/17
to increase targeted value addition for rural industrialisation to reduce post harvest loss.						
No. of industrial Incubatees taken on		15	5	20	25	30
No. of SME's created through incubation		40	11	45	50	35
No. of technologies deployed with incubatees		15	6	20	25	
No. of local raw materials developed and populated in the scientific databases		35	12	40	45	55
No. of model value addition centres established		5	2	2	1	1
No. of products up-scaled and commercialized by the centres		25	6	30	35	
No. of off-site pilot plants maintained		25	9	30	35	
No. of on-site machines and equipment maintained		180	55	210	250	
No. of technologies applied to reduce utility costs		25	7	30	35	
No. of apprentices taken for increased capacity in technology use and application		60	441	70	80	100
No. of industrial trainees taken on from higher institutions of learning		120	97	900	1000	1000
<b>Vote Function Cost (US\$ bn)</b>	<b>11.543</b>	<b>14.012</b>	<b>6.778</b>	<b>14.012</b>	<b>15.471</b>	<b>17.052</b>
<b>Cost of Vote Services (US\$ Bn)</b>	<b>11.543</b>	<b>14.012</b>	<b>6.778</b>	<b>14.012</b>	<b>15.471</b>	<b>17.052</b>

### Medium Term Plans

Bearing in mind that, just like any other Institution, UIRI is not immune to the challenges of inadequate financing which continue to impede the Institute's efforts in pursuing technology transfer, value addition, and meaningful contribution towards industrialization.

UIRI's medium term strategy is to;

- Establishment of a Regional Hub for Science, Technology, and Innovations (STI) in East and Central Africa in support of industrialization of EAC states.
- Establish platforms for value addition and product development
- Take technology to the people through the establishment of Model Agro- Processing facilities upcountry as per National agricultural zoning of resource abundant areas.
- Technology based business incubation
- Engaging in prudent technology transfer, technology development and fabrication of machinery
- Develop electronic and electric components
  
- Establishment of Model Agro- Processing facilities as per National agricultural zoning of resource abundant areas
  
- Skills development through training of entrepreneur and community based groups
- Develop the Essential oil sector in Uganda

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

- Support to manufacturers and scientists through provision of analytical laboratory services
- Establish Uganda Shea Butter processing Platform
- Establish a strong and vibrant business incubation center
- Establish adequate industrial infrastructure to stimulate industrialization
- Kick start small business enterprises for government revenue generation through taxes
- Develop skills capacity for meaning R&D
- Strengthen collaboration relations with sister institutions
- Embark on transfer of cost effective technologies and processes
- Deploy processing facilities as per the national agro zone regions and availability of raw materials for startup of primary industry.
- Creation of metallurgical center of excellence.

### (ii) Efficiency of Vote Budget Allocations

UIRI's key policy and process to be carried out and planned to address vote performance issues include but not limited to:

- Enhanced training and skills capacity building as included in the training budget item. Continuous training for technical personnel keeps them updated with evolving technologies and information that propels them to perform more effectively and efficiently.
- Collaboration with other agencies, WAITRO, CSIR, provide knowledge and experience sharing platforms that benefit and improve on methodology of best practices
- Facilitating dialogue and workshops for necessary exposure from those ahead of us

For Value for money assurance UIRI shall continue to engage in:

- Prudent and informed choices of technology sure by deploying competent of staff and best strategies for technology transfer
- Establishment of model agro processing that will stimulate raw material production for primary processing and subsequent secondary processing that will result into industrial manufacturing
- Taking technology to the people will encourage local participation at different levels of industrialization
- Extended services to incubatees and private sector

**Table V2.3: Allocations to Key Sector and Service Delivery Outputs over the Medium Term**

Billion Uganda Shillings	(i) Allocation (Shs Bn)				(ii) % Vote Budget			
	2013/14	2014/15	2015/16	2016/17	2013/14	2014/15	2015/16	2016/17
Key Sector	10.2	10.0	12.1	13.2	72.9%	71.7%	78.1%	77.5%
Service Delivery	2.7	2.7	3.5	3.9	19.0%	19.1%	22.7%	22.9%

Refer to Step 5

**Table V2.4: Key Unit Costs of Services Provided and Services Funded (Shs '000)**

### (iii) Vote Investment Plans

The funding in the medium term is still very inadequate to achieve an industrialized and manufacturing economy yet industrialization is a key strategy in the National Development Plan to addressing the high levels of unemployment. It is mainly through support to value addition that primary industries will develop and hence fed into a manufacturing lead economy. UIRI shall undertake procurement process of the following UIRI required Machinery, Equipment and Technologies Technology Development Center

- Machinery and equipment for establishment of a Foundry

Vaccine production unit

- Incubator for the Vaccine Production Unit

Bakery

- Four Deck Baking Oven i.e. used for baking especially cakes
- Dough Mixer (75kg dough capacity) to be used for mixing dough of up to 75kg
- Extruder to be used for making instant breakfast cereals e.g. cornflakes and pet foods

## Vote: 110 Uganda Industrial Research Institute

### Vote Summary

- Other small equipment/tools needed for Chocolate Making Project

Essential oil project

- Agri-weave technology
- 500kg Essential Oil distillation unit
- Irrigation Systems
- Purchase nursery inputs
- Renew organic certification services for essential oil project

Chemistry laboratory

- Soxtec system (Fat content), Fiber Tec system(fiber content) & Kjel-tec system (protein)
- Procurement of Laboratory Analytical Balance
- Procurement of Gas Chromatography/ Mass spectrometer (GC-MS) equipment
- 10 Analytical Chemistry & Laboratory text books

Instrumentation division

- 3D rapid prototyping printer
- Light Intensity meter
- Air Flow rate meter(Anemometer)
- Pressure meter/Manometer
- Hygro-Thermometer
- Power supply with variable negative range
- Reflow ovens
- Drilling machine(handheld)
- Drilling machine(bench machine)
- Printer/Scanner/Copier, Computer (to be handled by ICT)
- Logic Analyzer
- Moisture meter
- Clamp meter
- Multi-meter
- Documenting Process Calibrator

Food laboratory

- MAP packaging technology
- Extrusion technology
- Separation technology

Bakery

- Deluxe Professional Airbrush Cake Decorating System
- Infrared Thermometer
- Countertop Microwave Oven
- Polycarbonate Chocolate Moulds
- Silicone Scoop Shovel Scrapper Rabbler Multipurpose Spreader (pack of 3)
- Spoon Shaped Silicone Spatula Scrapper
- Fondant modeling Set
- Table Top Tempera
- Bench Scraper(large)
- Bench Scraper (Medium)
- Offset Spatula
- Pastry Scraper
- Multi-purpose Bowl Scraper
- Chocolate Shaver
- Chocolate Decorating Comb and Smoother (4"x6")
- Ladle (½ oz)

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

- Chocolate Dipping Tool Set
- Chocolate Dipping Tool Basket
- Mixing Bowl (4 quart)
- Double Boiler Insert 8 Cup Capacity
- Non-Stick Chocolate Bark Mold & Baker's Quarter Sheet
- Silicone Non-stick Baking Sheets
- White Marble Superfine Grain Slab
- Hot Air Gun
- Aluminum Chocolate Wrapping foil

### Meat technology

- Ice Flake Machine 500 Kgs/ 24 Hrs
- Sausage Filler 30 Lt
- Blast Freezer 4m X 4m Min Temp -18 Degrees
- Band Saw Free Standing
- Brine Injector

### Dairy technology

- Aluminum Milk Cans (50 Litre Capacity) - 50 Pieces
- Manual Cup Sealers - 3 Pieces
- Heavy Duty Plastic Crates - 200 pieces
- Positive Displacement Pump - 1 unit

### On- Line milk filter - 1 unit

### Automatic Vertical Form, fill & Seal Packaging Machine

### Small Scale Dairy Processing Equipment

### Lira Peanut and Research Center

- Peanut grinder for grinding ground nuts into peanut butter. This will enable us meet the demand because we roast a lot but the current grinder has a low capacity compared to the roasted capacity
- Generator is need especially when there is load shedding there is no other way to push ground nuts out of the roaster or cooler. All the big losses we have had are attributed to this.
- Compressor to deliver compressed air to filling machine for automatic filling
- Sachet packing machine for filling Peanut butter into sachets
- Welding machine for joining/welding processing machinery together especially during maintenance
- Laboratory Centrifuge
- Moisture analyzer
- Analytical balance
- Laboratory Oven
- Laboratory Blender

**Table V2.5: Allocations to Capital Investment over the Medium Term**

Billion Uganda Shillings	(i) Allocation (Shs Bn)				(ii) % Vote Budget			
	2013/14	2014/15	2015/16	2016/17	2013/14	2014/15	2015/16	2016/17
Consumption Expenditure(Outputs Provided)	10.2	10.3	12.3	13.5	72.9%	73.4%	79.5%	79.0%
Investment (Capital Purchases)	3.8	3.7	3.2	3.6	27.1%	26.6%	20.5%	21.0%
<b>Grand Total</b>	<b>14.0</b>	<b>14.0</b>	<b>15.5</b>	<b>17.1</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

The major capital investments during FY 2013/14 shall include but not limited to;

- Essential oils extraction equipment;
- Savoury meat equipment for UIRI ;
- A range of different fruit juice pulpers for UIRI;
- Chill unit equipment for UIRI;
- Cosmetics and detergents technology;
- Grains and animal feeds processing technology;

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

- Refrigerated cool boxes;
  - Procurement of toothpick packaging machine;
  - ICT hardware & software, ICT requirements, ICT network security systems, ICT utilities;
  - Establishment of Multi-purpose Engineering training lab, plumbing tools and equipment, energy Laboratory purchase of equipments for the initial phase of establishing Energy systems lab;
- The above mentioned equipment account for a total of 4.2 billion.

**Table V2.6: Major Capital Investments**

Project, Programme	2013/14		2014/15
Vote Function Output <i>US\$ Thousand</i>	Approved Budget, Planned Outputs (Quantity and Location)	Actual Expenditure and Outputs by September (Quantity and Location)	Proposed Budget, Planned Outputs (Quantity and Location)
<b>Project 0430 Uganda Industrial Research Institute</b>			
<b>065172 Government Buildings and Administrative Infrastructure</b>	<ul style="list-style-type: none"> <li>- Construct the northern Boundary wall</li> <li>- Upgrade the storm water channel along the northern boundary</li> <li>- Upgrade the access road to the Eastern gate</li> <li>- Finish architectural Plans for the construction of Namanve multi-purpose incubation facility</li> </ul>	<ul style="list-style-type: none"> <li>- Construct the northern Boundary wall is 95% complete</li> <li>- The Institute is drawing architectural plans to upgrade the storm water channel along the northern boundary</li> <li>- Arua Mango Juice facility is 95% complete</li> <li>- Luweero distillation house for essential Oil is 75% complete</li> <li>- Finish architectural Plans for the construction of Namanve multi-purpose incubation facility are almost complete</li> </ul>	<ul style="list-style-type: none"> <li>- Upgrading of access road to the Eastern gate as it is Laying of stabilized gravel</li> <li>- Proposed Incubation center at Namanve - A model facility</li> <li>- Chemistry lab refurbishmentA model facility</li> <li>- Proposed water bottling plant in Bushenyi</li> <li>- Proposed Kigezi Diocese Poultry House</li> <li>- Proposed Maziba Winery Project, Kabale</li> <li>- Proposed Kika Farm Juice processing facility in Luweero</li> <li>- Proposed MAFFACO (Masindi fruits farmer's Company) Mango Juice Processing Plant.</li> <li>- Proposed Ikirah Soap Processing Factory Lyatonde, Mitooma</li> <li>- Proposed Model Dairy Farm in NtungamoA model farm</li> <li>- Proposed Itojo Juice processing plant. Ntungamo District</li> <li>- Proposed G.nut processing plant in Agago.A model facility</li> <li>- Extra works at Essential oils LuweeroVariation to additional scope to include office premises and wet areas</li> <li>- Proposed Water bottling plant for J &amp; S in KawempeA model facility</li> <li>- Arua Savoury Classic meat processing Plant</li> </ul>
<b>Total</b>	<b>542,500</b>	<b>118,339</b>	<b>542,500</b>
<b>GoU Development</b>	<b>542,500</b>	<b>118,339</b>	<b>542,500</b>
<b>External Financing</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>065177 Purchase of Specialised Machinery &amp; Equipment</b>	Processing equipment and laboratory instruments are obtained to facilitate scientific innovations and value addition through research and small-scale	1. MULTIMETER, LCR Description: MULTIMETER, LCR, 83X172X38MM; Capacitance Measuring Range:2nF, 20nF,	Vaccine production unit - Incubator for the Vaccine Production Unit Bakery - Four Deck Baking Oven i.e.



# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

Project, Programme Vote Function Output <i>US\$ Thousand</i>	2013/14 Approved Budget, Planned Outputs (Quantity and Location)	Actual Expenditure and Outputs by September (Quantity and Location)	2014/15 Proposed Budget, Planned Outputs (Quantity and Location)
	enterprise support and development UIRI shall procure the following specialized Machinery and equipment - Polyethylene Agri weave weed mat - Interactive Traffic Light System - Automatic indoor/outdoor lighting system - Keypad based door lock system - Mother's baby thermometer - Biomedical Monitoring System (Heart rate and blood oxygen saturation measurement) - Intrusion Detection System - Solar Powered Egg incubator - Weighing Scale - Automated Intravenous Fluid delivery regulator system - Automatic Voltage Regulator - Field vehicle for Director TDC - Temperature Monitoring Control - Fingerprint and pin code based security access control system - Motion detection - bowl cutter, - pasteurizer, - Form fill seal machine - Distillation equipments for essential oil extraction - Laboratory equipment for analyze of oil quality - Compressors for the Ceramic Unit	200nF, 2μF, 20μF, 200μF, 600μF; Capacitance Range Accuracy:(1.0 + 5d); DMM Type:Hand Held; Inductance Measuring Range Accuracy:(2.0 + 8d); Inductance M  2. CLAMP METER, LOW CURRENT Description: CLAMP METER, LOW CURRENT; DMM Type:Clamp; Voltage Measuring Range DC:(Not Applicable); Voltage Measuring Range AC:(Not Applicable); Current Measuring Range DC:0A to 40A; Current Measuring Range AC:0A to 40A; Resistance M  3. HOT AIR STATION, 100 DEG TO 500 DEG Description: HOT AIR STATION, 100 DEG TO 500 DEG; Supply Voltage V AC:230V; Heat Temperature Range:+100°C to +500°C; Output Power:320W  4. Soldering Gun Description: Supply voltage AC: 230V; Power: 40W 5. PH Meter 6. Copeland compressa 7. Air Conditioners 8. Colormeter 9. Distillation Unit 10. Agrivweave technology	used for baking especially cakes - Dough Mixer (75kg dough capacity) to be used for mixing dough of up to 75kg - Extruder to be used for making instant breakfast cereals e.g. cornflakes and pet foods - Other small equipment/tools needed for Chocolate Making Project Essential oil project - Agri-weave technology - 500kg Essential Oil distillation unit - Irrigation Systems - Purchase nursery inputs - Renew organic certification services for essential oil project Chemistry laboratory - Soxtec system (Fat content), Fiber Tec system(fiber content) & Kjel-tec system (protein) - Procurement of Laboratory Analytical Balance - Procurement of Gas Chromatography/ Mass spectrometer (GC-MS) equipment - 10 Analytical Chemistry & Laboratory text books Instrumentation division - 3D rapid prototyping printer - Light Intensity meter - Air Flow rate meter(Anemometer) - Pressure meter/Manometer - Hygro-Thermometer - Power supply with variable negative range - Reflow ovens - Drilling machine(handheld) - Drilling machine(bench machine) - Printer/Scanner/Copier, Computer (to be handled by ICT) - Logic Analyzer - Moisture meter - Clamp meter - Multi-meter - Documenting Process Calibrator Food laboratory - Extruder - Develop breakfast cereals, instant porridges, nooddles from local foods like cassava and sweet potato (Q2) - Desktop pasteurizer- Enable physical preservation of fluid foods at lab level before packaging (Q3)

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

Project, Programme	2013/14		2014/15
Vote Function Output <i>UShs Thousand</i>	Approved Budget, Planned Outputs (Quantity and Location)	Actual Expenditure and Outputs by September (Quantity and Location)	Proposed Budget, Planned Outputs (Quantity and Location)
			<ul style="list-style-type: none"> <li>- Electrical dryer - Fast and efficient drying of food products during product development (Q3)</li> <li>- cooker- Acquire an effective heat source in the laboratory (Q1)</li> <li>- Industrial blender - Acquire an equipment that can blend and mix (Q2)</li> <li>- Gas cylinders with regulators (CO2, N2, O2)- Accessories the MAP equipment already procured with a gas supply (Q3)</li> <li>- MAP packaging technology</li> <li>- Extrusion technology</li> <li>- Separation technology</li> <li>- Bakery</li> <li>- Deluxe Professional Airbrush Cake Decorating System</li> <li>- Infrared Thermometer</li> <li>- Countertop Microwave Oven</li> <li>- Polycarbonate Chocolate Moulds</li> <li>- Silicone Scoop Shovel</li> <li>- Scrapper Rabbler Multipurpose Spreader (pack of 3)</li> <li>- Spoon Shaped Silicone Spatula Scrapper</li> <li>- Fondant modeling Set</li> <li>- Table Top Tempera</li> <li>- Bench Scraper(large)</li> <li>- Bench Scraper (Medium)</li> <li>- Offset Spatula</li> <li>- Pastry Scraper</li> <li>- Multi-purpose Bowl Scraper</li> <li>- Chocolate Shaver</li> <li>- Chocolate Decorating Comb and Smoother (4"x6")</li> <li>- Ladle (½ oz)</li> <li>- Chocolate Dipping Tool Set</li> <li>- Chocolate Dipping Tool Basket</li> <li>- Mixing Bowl (4 quart)</li> <li>- Double Boiler Insert 8 Cup Capacity</li> <li>- Non-Stick Chocolate Bark Mold &amp; Baker's Quarter Sheet</li> <li>- Silicone Non-stick Baking Sheets</li> <li>- White Marble Superfine Grain Slab</li> <li>- Hot Air Gun</li> <li>- Aluminum Chocolate Wrapping foil</li> <li>- Meat technology</li> <li>- Ice Flake Machine 500 Kgs/ 24 Hrs</li> <li>- Sausage Filler 30 Lt</li> <li>- Blast Freezer 4m X 4m Min Temp -18 Degrees</li> <li>- Band Saw Free Standing</li> <li>- Brine Injector</li> </ul>

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

Project, Programme Vote Function Output <i>US\$ Thousand</i>	2013/14		2014/15
	Approved Budget, Planned Outputs (Quantity and Location)	Actual Expenditure and Outputs by September (Quantity and Location)	Proposed Budget, Planned Outputs (Quantity and Location)
			<ul style="list-style-type: none"> <li>- Dairy technology</li> <li>- Aluminum Milk Cans (50 Litre Capacity) - 50 Pieces</li> <li>- Manual Cup Sealers - 3 Pieces</li> <li>- Heavy Duty Plastic Crates - 200 pieces</li> <li>- Positive Displacement Pump - 1 unit</li> <li>- On- Line milk filter - 1 unit</li> <li>- Automatic Vertical Form, fill &amp; Seal Packaging Machine</li> <li>- Small Scale Dairy Processing Equipment</li> <li>- Lira Peanut and Research Center</li> <li>- Peanut grinder for grinding ground nuts into peanut butter. This will enable us meet the demand because we roast a lot but the current grinder has a low capacity compared to the roasted capacity</li> <li>- Generator is need especially when there is load shedding there is no other way to push ground nuts out of the roaster or cooler. All the big losses we have had are attributed to this.</li> <li>- Compressor to deliver compressed air to filling machine for automatic filling</li> <li>- Sachet packing machine for filling Peanut butter into sachets</li> <li>- Welding machine for joining/welding processing machinery together especially during maintenance</li> <li>- Laboratory Centrifuge</li> <li>- Moisture analyzer</li> <li>- Analytical balance</li> <li>- Laboratory Oven</li> <li>- Laboratory Blender</li> </ul>
<b>Total</b>	<b>4,371,598</b>	<b>802,147</b>	<b>3,087,971</b>
<i>GoU Development</i>	<i>4,371,598</i>	<i>802,147</i>	<i>3,087,971</i>
<i>External Financing</i>	<i>0</i>	<i>0</i>	<i>0</i>

### (iv) Vote Actions to improve Priority Sector Outcomes

UIRI's key policy and process to be carried out and planned to address vote performance issues include but not limited to:

- Enhanced training and skills capacity building as included in the training budget item. Staff to Continuous training for technical personnel keeps them updated with evolving technologies and information that propels them to perform more effectively and efficiently.
- Collaboration with other agencies, WAITRO, CSIR, provide knowledge and experience sharing platforms that benefit and improve on methodology of best practices
- Facilitating dialogue and workshops for necessary exposure from those ahead of us

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

For Value for money assurance UIRI shall continue to engage in:

- Prudent and informed choices of technology sure by deploying competent of staff and best strategies for technology transfer
- Establishment of model agro processing that will stimulate raw material production for primary processing and subsequent secondary processing that will result into industrial manufacturing
- Taking technology to the people will encourage local participation at different levels of industrialization
- Extended services to incubatees and private sector

The above intuitive will aim at addressing the following challenges

- Low level of technology use
- Lack of technical skills
- Flawed planning and imprudent resource allocation
- Inadequate facilitation impedes technology transfer, value addition, etc
- Lack of information and access to value addition funds.
- Poor infrastructure and low connectivity
- Very slow pace for industrial growth
- Inadequate pool of specialized scientists and engineers.
- Dealing with a business community that seriously lacks entrepreneurial competences
- National planning process does not promote inter-institutional collaborations.
- Unfunded mandates / projects.
- Inadequate funding for r & d continues to be a national malady
- Limited skilled manpower and lack of entrepreneurial skills
- Infrastructure problems (e.g. Connectivity, energy, transport, etc)
- Inadequate facilities for research and prototyping
- Funding UIRI would help mitigate the above challenges and would have immediate impact on Uganda's socio- economic transformation

**Table V2.7: Priority Vote Actions to Improve Sector Performance**

2013/14 Planned Actions:	2013/14 Actions by Sept:	2014/15 Planned Actions:	MT Strategy:
<b>Sector Outcome 1: A Competitive and Export-oriented Industrial Sector</b>			
Vote Function: 06 51 Industrial Research			
<i>VF Performance Issue: Inadequate application of scientific research and technology for development</i>			
Development of human resource skills needed for comprehensive handling of new and already existing technologies, market and product research to match appropriate and cost effective technologies, management of academia and industry technology transfer.	UIRI continues to invest in its human resource. It provides trainings, skills and capacity development programs for staff in particular fields of interest. It subscribes to scientific research bodies that provide a platform for researchers, scientists and engineers to access and share - Innovative research, scientific consultancy & regulatory guidance. - On- line research material and the latest presentations on global consumer trends, novel research methodologies and nutrition research which is critical for value addition projects and product development in an increasingly dynamic food and	Upgrade staff skills to measure up to the ever evolving technologies to be able to design and develop competitive products and services	Development of human resource capacity to undertake applied research; Establish project pilot center in two municipalities; Development of industrial projects and technologies for commercialization

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

2013/14 Planned Actions:	2013/14 Actions by Sept:	2014/15 Planned Actions:	MT Strategy:
	<p>drink industry.</p> <ul style="list-style-type: none"> <li>- Free &amp; exclusive attendance at 3 annual flagship events: Food Innovation, Nutrition &amp; Food Safety.</li> <li>- Weekly Legal Highlights email and archive access.</li> <li>- Daily Foodline News email and archive access.</li> <li>- Online technical updates via a Foodline database.</li> <li>- Direct access to extensive libraries</li> <li>- Access to a 24/7 Crisis Management line.</li> <li>- Preferential Member rates (up to 30% lower) on trainings, conferences, publications&amp; online services.</li> </ul> <p>All these initiatives are aimed at improving and maintaining UIRI employees knowledgeable and in touch with the fast changing and evolving technologies.</p>		
<p><i>VF Performance Issue: The need to functionalize set up value addition projects</i></p> <p>Operationalise model value additional centers that have been set up for demonstration of the benefits of value addition and hence widen awareness and interest in the public. These will act as hubs for knowledge and skills transfer.</p>	<p>UIRI Model Value Addition Centers established in line with the GOU's strategy of encouraging mass industrialization at every resource abundant area, include but not limited to;</p> <ul style="list-style-type: none"> <li>- Kabale Potatoe Processing Facility</li> <li>- Lira Peanut and Research Center</li> <li>- Nabusanke Fruit Juice Processing Facility</li> <li>- Arua Mango Juice Processing Facility</li> <li>- UIRI pilot plants</li> <li>- Luweero Essential Oil Pilot Project</li> <li>- Kabale Mushroom Training and Research Center</li> <li>- Busia Meat Packers</li> <li>- Mbarara Winery Processing Facility</li> </ul> <p>The above facilities are at different levels of operationalisation. The Institute aims to attain 100% full operations by Q2 FY 2014/15.</p>	<p><b>Establish the Regional Scientific and Innovation hub as Center of Excellence.</b></p>	<p>Establishment of five multi-function value addition centers across at regional level; Developed value added industries especially agro industries as per the National agro zone centers.</p>
<p><i>VF Performance Issue: Un-competitiveness of local industries</i></p> <p>In partnership with capable private partners through</p>	<p>Under the UIRI Industrial and Technological Incubator</p>	<p><b>Enhance the Business incubation portfolio. Take</b></p>	<p>Set up a technology depository at UIRI; Establish regional</p>

# Vote: 110 Uganda Industrial Research Institute

## Vote Summary

2013/14 Planned Actions:	2013/14 Actions by Sept:	2014/15 Planned Actions:	MT Strategy:
business incubation will develop and commercialize a range of value added products. Work with Agricultural institutes in developing crop varieties and animal breeds suitable for high value products.	program that has grown into a vibrant, robust and competent platform that sets up and hand holds enterprises to self sustainability. Innovations and value added products are developed in partnership with private sector aimed for commercialisation. The UIRI Incubator program assisting in <ul style="list-style-type: none"> <li>- Nurturing and growing start-up agribusiness enterprises,</li> <li>- Training in application of best practices, international standards of management and enhanced work ethic for indigenous enterprises,</li> <li>- Mentoring and cultivating other professional business management practices.</li> <li>- Practical trainings in business managerial competence, book keeping and business discipline.</li> <li>- Trainings in principles of technology acquisition, deployment and diffusion.</li> </ul>	technology to the people	business incubation centers in industrial parks; Install a foundry and mineral beneficiation testing lab at UIRI.

## V3 Proposed Budget Allocations for 2014/15 and the Medium Term

This section sets out the proposed vote budget allocations for 2014/15 and the medium term, including major areas of expenditures and any notable changes in allocations.

**Table V3.1: Past Outturns and Medium Term Projections by Vote Function\***

	2012/13 Outturn	2013/14		MTEF Budget Projections		
		Appr. Budget	Spent by End Sept	2014/15	2015/16	2016/17
<b>Vote: 110 Uganda Industrial Research Institute</b>						
0651 Industrial Research	11.543	14.012	3.356	14.012	15.471	17.052
<b>Total for Vote:</b>	<b>11.543</b>	<b>14.012</b>	<b>3.356</b>	<b>14.012</b>	<b>15.471</b>	<b>17.052</b>

### (i) The Total Budget over the Medium Term

### (ii) The major expenditure allocations in the Vote for 2014/15

UIRI's major expenditure is on purchase of specialized machinery and equipment. The focal point in industrializing Uganda is to establish primary industries that would feed into manufacturing industry. The machinery and equipment purchased are for establishment of model or primary industries that would stimulate increased production of raw materials, increased processed volumes necessary for industrial production.

### (iii) The major planned changes in resource allocations within the Vote for 2014/15

- Inadequate investment in R&D which had been proposed to be at least 1% of GDP but is still lower than 0.04%
- Societal mindset in respect to quality, especially quality products, continues to hamper creation of

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competitive enterprises

- Society's inclination towards retail business also doesn't encourage investment in production facilities
- Other drawbacks include lack of entrepreneur skills within private sector low availability of affordable financing, low level of technology use and lack of requisite technical skills
- Institutions of higher learning are not adequately preparing graduates to take participation in industrial activities

**Table V3.2: Key Changes in Vote Resource Allocation**

Changes in Budget Allocations and Outputs from 2013/14 Planned Levels:			Justification for proposed Changes in Expenditure and Outputs
2014/15	2015/16	2016/17	
<i>Vote Function:0601 Industrial Research</i>			
<b>Output: 0651 01 Administration and Support Services</b>			
US\$ Bn: -1.520	US\$ Bn: 0.711	US\$ Bn: 1.211	
<b>Output: 0651 02 Research and Development</b>			
US\$ Bn: -0.200	US\$ Bn: 0.304	US\$ Bn: 0.528	
This output will be measured against number of regional pilot processing plants set up. Number of value added products produced Number of SMEs	This output will be measured against number of regional pilot processing plants set up. Number of value added products produced Number of SMEs		
<b>Output: 0651 08 Popularization of research and technologies</b>			
US\$ Bn: 0.250	US\$ Bn: 0.220	US\$ Bn: 0.250	
<b>Output: 0651 76 Purchase of Office and ICT Equipment, including Software</b>			
US\$ Bn: 0.010	US\$ Bn: 0.010	US\$ Bn: 0.028	

## V4: Vote Challenges for 2014/15 and the Medium Term

This section sets out the major challenges the vote faces in 2014/15 and the medium term which the vote has been unable to address in its spending plans.

It should be noted that there has been high staff turnover during FY 13/14 due to salary. The current budget highlights UIRI's staff in post. There is urgent need to revise the remuneration of UIRI staff to maintain their motivation momentum as to keep them motivated

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

Additional Requirements for Funding and Outputs in 2014/15:	Justification of Requirement for Additional Outputs and Funding
<i>Vote Function:0601 Industrial Research</i>	
<b>Output: 0651 01 Administration and Support Services</b>	
US\$ Bn: • Support to UIRI	Capacity building efforts would mitigate against lack of skills, competences and entrepreneurship that is a weakness squarely faced by the country. The acquired skills that are diverse in nature would be distributed across other sister institutions, like the petroleum industry, manufacturing industry which would indeed catalyse the industrialisation process of Uganda.
<b>Output: 0651 02 Research and Development</b>	
US\$ Bn: • Capacity building for Industrial Research and Development	Additional funding would be directed to re-equipment and accreditation of analytical laboratories, recruitment of high calibre talent to conduct meaningful R&D with ability to operate hi-tech machinery and equipment being procured, support for UIRI business incubator and set up of a modern unit for product development.

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Additional Requirements for Funding and Outputs in 2014/15:	Justification of Requirement for Additional Outputs and Funding
<b>Output: 0651 03 Industrial and technological Incubation</b> <b>US\$ Bn:</b>	<i>As part of the effort towards Uganda's socio-economic transformation. A direct method of increasing house hold incomes is the platform of the envisaged Business Incubator Center of Excellence which is intended to apply the principles of technology transfer and leapfrog some of the evolutionary steps of the business incubation process, an approach that has been rated 85% successful as a proven mechanism to nurture start up enterprises.</i>
<b>Output: 0651 77 Purchase of Specialised Machinery &amp; Equipment</b> <b>US\$ Bn:</b>	<i>Government initiative for One Villiage One Product (OVOP) would be addressed on the assumption that Ministry of Finance allocates more funds to improving technology through acquisition of specialised machinery and equipment , development of technical skills through capacity building &amp; training, business incubator programes to kick start primary industries a prerequisite for a manufacturing and an industrilised economy.</i>

*This section discusses how the vote's plans will address and respond to the cross-cutting policy, issues of gender and equity; HIV/AIDS; and the Environment, and other budgetary issues such as Arrears and NTR..*

### (i) Cross-cutting Policy Issues

#### (i) Gender and Equity

URI has continued to encourage and support women led projects in agro processing through training and provision of technologies. These projects are aimed at improving the socio economic transformation of such groups for instance, Kasaka mothers union in Mpigi district, MTRC mushroom production in Kabale district. Other efforts addressing gender and equity issues include business incubation to support start up business, these are pursued under in-house or virtual incubation models.

#### (ii) HIV/AIDS

Medical cover for staff and their immediate dependants is provided.

#### (iii) Environment

Effort has been made to develop an Environmental Social Management Framework Plan to demonstrate compliance to environment issues in especially waste management, Physical environment issues like concern for pollution and safety of laboratory officers by use of protective wear. Other efforts include deployment of environment friendly technologies during the technology transfer for example development of paper products that are degradable. Through capacity building staff will be trained in relevant environment safety and management studies.

### (ii) Payment Arrears

The table below shows all the payment arrears outstanding for the Vote:

N/A

### (ii) Non Tax Revenue Collections

The table below shows Non-Tax Revenues that will be collected under the Vote:

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Source of NTR	UShs Bn	2012/13 Actual	2013/14 Budget	2013/14 Actual by Sept	2014/15 Projected
Rent & rates – produced assets – from private entities				0.000	0.100
	<b>Total:</b>			<b>0.000</b>	<b>0.100</b>

Contributions by UNBS