



# SCIENCE, TECHNOLOGY AND INNOVATION SECTOR

## ANNUAL BUDGET MONITORING REPORT

FINANCIAL YEAR 2019/20

NOVEMBER 2020

Ministry of Finance, Planning and Economic Development  
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## ABBREVIATIONS

BIRDC	Banana Industrial Research and Development Centre
BMAU	Budget Monitoring and Accountability Unit
COVID 19	Corona Virus Disease 2019
DC	Development Committee
EAC	East African Community
ECGF	Electronically Controlled Gravity Feed
EU	European Union
GoU	Government of Uganda
ICT	Information, Communications Technology
IFMS	Integrated Financial Management System
IPR	Intellectual Property Rights
ISO	International Standards Organization
IUEA	International University of East Africa
JIBP	Jinja Industrial and Business Park
KMC	Kiira Motors Corporation
LG	Local Government
MDA	Ministry, Departments and Agencies
MEMD	Ministry of Energy and Mineral Development
MFPED	Ministry of Finance, Planning and Economic Development
MMISC	Manufacturing, Machining and Industrial Skilling Centre
MoSTI	Ministry of Science, Technology and Innovations
NARO	National Agricultural Research Organization
NDP II	National Development Plan II
NSTEISP	National Science, Technology Engineering and Innovation Skills Enhancement Project
PIBID	Presidential Initiative on Banana Industrial Development Project
R&D	Research and Development
STI	Science, Technology and Innovations
STP	Science and Technology Parks
TIBIC	Technology Innovation and Business Incubation Centre
UEDCL	Uganda Electricity Distribution Company Limited
UIRI	Uganda Industrial Research Institute
UK	United Kingdom
UNBS	Uganda National Bureau of Standards
UNCST	Uganda National Council for Science and Technology
UNDP	United Nations Development Programme
UNIDO	United Nations Development Organization
UVRI	Uganda Virus Research Institute

## FOREWORD

The Financial Year 2019/20 strategy focused on stimulating import substitution and export promotion, and incentivising private sector development. The government prioritised agriculture and agro-industrialisation, manufacturing, and mineral development to ensure inclusive growth and the creation of jobs, while promoting development of other key primary growth sectors. The economy grew despite the challenges experienced during the year. The wellbeing of Ugandans, and infrastructure necessary for development also improved considerably.

The above achievements notwithstanding, majority of the second National Development Plan (NDPII) outcome indicators were not achieved. This report by the Budget Monitoring and Accountability Unit (BMAU) shows that majority of the sectors monitored posted a fair performance, despite receiving a substantial amount of their budgets.

I encourage all government institutions, the private sector, development partners, and other key players in the development of this country, to harness the strengths coming with Programme Based Budgeting (PBB), and take cognizant of the lessons learnt during the NDPII to improve service delivery during this NDPIII period.



Keith Muhakanizi

**Permanent Secretary/Secretary to the Treasury**

# EXECUTIVE SUMMARY

## Introduction

The Science, Technology and Innovations (STI) Sector coordinates all activities and programmes relating to research, science, technology and innovation. The sector has two Votes and three subventions namely: Vote 023: Ministry of Science, Technology and Innovations (MoSTI); Vote 110: Uganda Industrial Research Institute (UIRI), and the subventions of: Uganda National Council for Science and Technology (UNCST), Kiira Motors Corporation (KMC), and the Presidential Initiative on Banana Industrial Development (PIBID) also known as Banana Industrial Research and Development Centre (BIRDC).

This report presents the annual implementation and achievement of set targets by 30<sup>th</sup> June, 2020 for the various programmes in the sector. The findings were generated from review of quarterly reports and physical monitoring of the programmes, sub-programmes and outputs within the Votes.

## Overall Performance

Overall sector performance was fair at 59.2%. Achievement of sector outcomes was poor at 47.5%. Most of the recurrent sub-programmes especially those under Finance and Administration exhibited good performance, while the development component performed fairly.

## Financial Performance

The sector approved budget for FY2019/20 was Ug shs 205.823billion (bn), of which Ug shs 92.331bn and Ug shs 10bn were supplementary to MoSTI and UIRI respectively. Ug shs 195.124bn (94.8%) was released and Ug shs 194.120bn (99.5%) expended by 30<sup>th</sup> June, 2020. Overall sector budget release and expenditure were very good.

## Highlights of Sector Performance

### The Regulation Programme

The overall programme performance was fair at 52%. The programme catalogued bio-economy resources and bio-fortified products nationally, and three planning meetings for the National Biosafety Conference were conducted. A concept and terms of reference (ToRs) for the National Science Mentorship Programme were developed. ToRs for the feasibility study for research and development in indigenous knowledge, nanotechnology and material science were developed. Consultative meetings with universities on the National Space Programme were conducted. Staff under the Bio-safety and Bio-security Sub-programme were trained in genetically modified organisms. The Science, Technology and Innovations Draft Policy, and five year draft National Space Science Roadmap were developed.

### Research and Innovation Programme

The overall programme performance was poor at 48.4%. The programme developed a concept for the National Research Agenda and profiled researchers in the 10 districts of Teso sub-region. A comparative study on the establishment and journey of Science and Technology Parks (STPs) was conducted. A project concept note on the establishment of STPs was revised and submitted to development committee. The STI infrastructure profiling was conducted in key research and development centres and institutions of higher learning. Five innovation and intellectual property clinics and trainings were conducted, 10 innovators were supported to develop intellectual property rights, and 50 innovators were profiled. A total of 20 scientists and researchers were supported to undertake COVID-19 research.



**Uganda National Council for Science and Technology (UNCST)**, the ToRs for the environmental and social impact assessment and monitoring plan for National Science, Technology Engineering and Innovation Skills Enhancement Project (NSTEIP) were developed. The project steering committee was constituted and draft communication and dissemination plan developed. A project management team was recruited. The supervisor for civil work for TIBIC-Namanve was procured. The project acquired 45 acres of land in Nyakasharara, Kiruhura District for construction of the NSTEIC. The cadastral and topographic surveys for TIBIC-Namanve were done, while those for the Kiruhura site were ongoing. Project implementation was behind schedule due to land related challenges and the COVID-19 lockdown.

**Kiira Motors Corporation (KMC)**: Good progress was observed with the construction of the Vehicle Assembly Shop at 50% progress, both the sub and super structures were completed. Construction of the Kiira Vehicle Plant Warehouse was at 75% progress, with sub and super structures constructed and shutters installed. Construction of the circular roads (6.4km) in the industrial park was estimated at 70% physical progress. The activity was behind schedule due to expiry of the contract for the consultant. Two hybrid buses and two charging kits were built. The buses were issued license plates and road tests were done along the Kampala-Entebbe express highway. A statement of requirements for the Kayoola Bus Seat Engineering, production samples and KMC bus warranty plan were developed. In response to the outbreak of COVID-19, KMC developed a low cost medical ventilator (*Bulamu*) to be used by COVID-19 patients under intensive care using funding (Ug shs 75,925,175) from the Resilient Africa Network. Although the project realised 100% budget release in the period under review, the appropriated budget was below the agreed medium term outlays and this was negatively impacting the project execution schedule.

**Banana Industrial Research and Development Centre (BIRDC)** was registered as a company in fulfillment of the strategy for operationalisation of the Presidential Initiative on Banana Industrial Development. Efficiency optimisation studies for the primary processing of bananas and testing of the peeling machine were ongoing. The company was in the final process of acquiring a UNBS quality distinctive mark. Marketing of the products was ongoing within and outside the country. Commercialisation of research laboratories awaited accreditation by UNBS. During the period under review, the pilot plant processed 589MT of fresh bananas amidst the price of raw bananas going as low as Ug shs 2,000 per bunch in the months of May to July 2020. The BIRDC had 11 and 37 metric tonnes of raw and instant banana chips respectively in stores. The delay in acquiring the quality mark from UNBS affected the marketability of the products. By July 2020, the banana processing pilot was not operating on commercial scale and the BIRDC did not have a substantive board of directors.

**Sericulture Technologies and Innovations Project** established and maintained 116 hectares of experimental mulberry gardens (silk worm feeds) in Sheema, Mukono, Kamuli, Iganga and Nwoya districts, and 1,203 farmers were sensitised and trained in technical aspects of sericulture value chains. Construction of silk worm rearing houses and reeling houses in Sheema and Mukono stations was at 70% progress. The equipment (reeling and re-reeling machines) was being manufactured in the People's Republic of China.

**Science Entrepreneurship Programme**, the overall performance was fair (52.2%). The programme conducted consultative meetings with district local governments on technopreneurship. Technopreneurship skills meetings to commercialise shea butter technologies and innovations were conducted in Teso sub-region. Trainings on laundry bar soap making in Iganga District was conducted. The programme supported the following events geared to promoting innovation: Bunyoro Youth Innovations Awards in Masindi District, Top 100 SMEs Award Program in Kampala, Technical and Vocational Education and Training (TVET) skills competition in four regions of Uganda and

commemoration of the World Science Day.

### **Industrial Research Programme**

The Uganda Industrial Research Institute (UIRI) realised 100% budget release. The overall programme performance was good at 84.4%. The UIRI developed formulations for instant hand sanitisers and germicidal liquid detergents to be used in prevention of COVID-19 spread. The UIRI also developed formulations for cultivation of oyster mushrooms using cotton stalks and a solar water heating system prototype.

The construction and installation of equipment at the Manufacturing, Machining and Industrial Skilling Centre at the Kampala Industrial and Business Park-Namanve was completed. The Centre was commissioned on 14<sup>th</sup> January 2020. In the fight against COVID-19, the UIRI procured equipment for manufacture of face masks that included: 120 industrial straight stitching sewing machines, two autoclaves for sterilisation of medical masks, textile hot press, and textile quality control equipment.

### **Conclusion**

In spite of a very good release and expenditure performance, the STI sector overall performance was average at 59.2%. This was largely due to the poor performance under the Research and Innovation Programme which registered limited progress on most output and outcome targets. Operationalisation of the pilot plant under BIRDC was not achieved. Most activities under MoSTI that included consultative meetings and workshops in the last two quarters of FY2019/20 were not carried out due the outbreak of COVID-19 and the subsequent lockdown. The fair performance of the sector was also attributed to: poor prioritisation of key STI interventions, delayed initiation of procurements, and infrastructure gaps to commercialise science and technology innovations.

### **Recommendations**

- i) The STI Sector prioritise funding for development activities for STI infrastructure like STI parks to facilitate innovations.
- ii) The MoSTI should develop and implement a national technology transfer and adoption strategy to aid commercialisation of innovations and enhance public engagements to appreciate the role of STI in national development.
- iii) The MoSTI should enhance capacity of implementing agencies to avoid project delays.
- iv) The MoSTI should approve the governance boards for Kiira Motors Corporation and the Banana Industrial Research and Development Centre to ensure good governance.
- v) The MoSTI should lead the process of the sericulture project becoming a public investment project with clear objectives, activities, outputs, outcomes and timeframe.



# CHAPTER 1: BACKGROUND

## 1.1 Introduction

The mission of the Ministry of Finance, Planning and Economic Development (MFPED) is, “*To formulate sound economic policies, maximize revenue mobilization, and ensure efficient allocation and accountability for public resources so as to achieve the most rapid and sustainable economic growth and development*”. It is in this regard that the Ministry gradually enhanced resource mobilization efforts and stepped up funds disbursement to Ministries, Departments, Agencies (MDAs), and Local Governments (LG) in the past years to improve service delivery.

Although some improvements have been registered in citizens’ access to basic services, their quantity and quality remains unsatisfactory, particularly in the sectors of health, education, water and environment, agriculture, ICT and roads. The services being delivered are not commensurate to the resources that have been disbursed, signifying accountability and transparency problems in the user entities.

The Budget Monitoring and Accountability Unit (BMAU) was established in FY2008/09 in MFPED to provide comprehensive information for removing key implementation bottlenecks. The BMAU is charged with tracking implementation of selected government programmes or projects and observing how values of different financial and physical indicators change over time against stated goals and targets (how things are working). This is achieved through semi-annual and annual field monitoring exercises to verify receipt and application of funds by the user entities. Where applicable, beneficiaries are sampled to establish their level of satisfaction with the public service.

The BMAU prepares semi-annual and annual monitoring reports of selected government programmes and projects. The monitoring is confined to levels of inputs, outputs and outcomes in the following areas:

- Accountability
- Agriculture
- Infrastructure (Energy and Roads)
- Industrialisation
- Information and Communication Technology (ICT)
- Social Services (Education and Sports, Health, and Water and Environment)
- Public Sector Management; and
- Science, Technology and Innovation

## 1.2 Secor Mandate

The Science, Technology and Innovations (STI) Sector was created in FY2018/19 to coordinate all activities and programmes relating to research, science, technology and innovation. The sector has two votes and three subventions namely: Vote 110: Uganda Industrial Research Institute (UIRI), and Vote 023 - Ministry of Science, Technology and Innovation (MoSTI). The Kiira Motors Corporation (KMC), the Uganda National Council for Science and Technology (UNCST), and the Banana Industrial Research and Development Centre (BIRDC/PIBID) are subventions under Vote 023.



### 1.3 Sector Objectives

The STI Sector is guided by four strategic objectives as provided in the Second National Development Plan (NDP II):

- To enhance the integration of science, technology and innovation into the national development process.
- To increase transfer and adaptation of technologies.
- To enhance research and development in Uganda, and
- To improve the science, technology and innovation legal and regulatory framework.



## CHAPTER 2: METHODOLOGY

### 2.1 Scope

This chapter reviews progress of programmes and projects implemented by the sector agencies in FY 2019/20 for the period 1<sup>st</sup> July 2019 to 30<sup>th</sup> June 2020.

**Table 2.1: Scope of Annual Monitoring for FY 2019/20**

Vote	Programme/Sub-programme
Vote 023, Ministry of Science, Technology and Innovations (MoSTI)	Regulation Research and Innovation Programme 1. Kiira Motors Corporation (KMC), 2. Uganda National Council for Science and Technology (UNCST) 3. Banana Industrial Research and Development Centre (BIRDC) Science entrepreneurship
Vote 110 Uganda Industrial; Research Institute (UIRI)	Industrial Research Programme

*Source: Author's Compilation*

### 2.2 Methodology

Physical performance of projects and outputs was assessed through monitoring a range of indicators and linking the progress to reported expenditure. Across all the projects and programmes monitored, the key variables assessed included: performance objectives and targets, inputs and outputs.

#### 2.2.1 Sampling

All programmes, and sub-programmes were monitored. Priority was given to monitoring outputs that were physically verifiable.

#### 2.2.2 Data Collection

Data was collected from various sources through a combination of approaches:

- Review of secondary data sources including: Ministerial Policy Statements for FY2019/20; National and Sector Budget Framework Papers; Sector project documents and performance reports from the Programme Budgeting System (PBS), Sector Quarterly Progress Reports and work plans, Budget Speech, Public Investment Plans, Approved Estimates of Revenue and Expenditure, and data from the Budget Website.
- Review and analysis of data from the Integrated Financial Management System (IFMS) and Quarterly Performance Reports from implementing agencies.
- Consultations and key informant interviews with project managers in implementing agencies both at the Central and Local Government level.
- Field visits to project areas for primary data collection, observation and photography.
- Call-backs in some cases to triangulate information



### 2.2.3 Data Analysis

The data was analysed using both qualitative and quantitative approaches. Comparative analysis was done using the relative importance of the outputs and the overall weighted scores.

Relative importance (weight) of an output monitored was based on the amount of budget attached to it; thus the higher the budget the higher the contribution of the output to the sector performance. This was derived from the approved annual budget of each output divided by total annual budget of all outputs of a particular programme/project. The weight of the output and percentage achievement for each output were multiplied to derive the weighted physical performance. The overall programme/project performance is a summation of all weighted scores for its outputs. On the other hand, the overall sector performance is an average of individual programme performances that make up the sector.

The performance was rated on the basis of the criterion in table 2.2.

**Table 2.2: Assessment guide to measure performance of projects monitored in FY2019/20**

SCORE	COMMENT
90% and above	Very Good (Most of the set targets achieved and funds absorbed)
70%-89%	Good (Some core set targets achieved and funds absorbed to 70%-89%)
50%- 69%	Fair (Few targets achieved and funds absorption is 50%-69%)
Less than 50%	Poor (No targets achieved and or funds absorption is less than 50%)

### 2.3 Limitations of the report

The preparation of this report was constrained by a number of factors namely:

- Lack of detailed quarterly work plans and targets for some programmes/projects/outputs.
- Lack of disaggregated financial information for some outputs which might have affected the overall weighted scores and performance.
- Inadequate sampling of beneficiaries due to limited field time.
- Some of the beneficiaries had little information on scope of works, project costs, contract periods particularly on projects contracted and implemented by some Votes.
- Insufficient financial information at output level from the votes might have affected the performance rating of the sector.
- The outbreak of COVID-19 reduced the level of interactions with some key stakeholders.



## CHAPTER 3: SECTOR PERFORMANCE

### 3.1 Overall Sector Performance

The overall sector performance was fair at 59.2%. The recurrent programmes performed better than development programmes.

#### Financial performance

The STI sector budget for FY2019/20 was Ug shs 205.823billion (bn) of which Ug shs195.124bn (94.8%) was released and Ug shs 194.12bn (99.5%) expended by 30<sup>th</sup> June, 2020. The overall sector release and expenditure performance was very good. Table 3.1 shows the overall sector financial performance.

**Table 3.1: Overall Financial Performance of the STI Sector by 30<sup>th</sup> June, 2020**

Institution	Budget	Release	Expenditure	% Release	% Spent
MoSTI	181,592,994,220	170,894,155,629	169,907,277,178	94.2	99.4
UIRI	24,229,935,060	24,229,935,060	24,213,189,471	100	99.9
TOTAL	205,822,929,280	195,124,090,689	194,120,466,649	94.8	99.5

Source: IFMS, MDAs

#### Vote performance

### 3.2 The Ministry of Science, Technology and Innovation (MoSTI)

The Ministry of Science, Technology and Innovation (MoSTI) was created in June 2016. The MoSTI's mandate is to: Provide policy guidance and coordination on matters of Scientific Research, Development, and the entire National Innovation System in the country.

The Ministry executes its mandate through the following programmes: i) (STI) Regulation, ii) Research and Innovation, iii) Science Entrepreneurship, and iv) General Administration and Planning.

The Banana Industrial Research and Development Centre (BIRDC), Uganda National Council for Science and Technology (UNCST), and Kiira Motors Corporation (KMC) are subventions under the vote.

#### 3.2.1 Regulation Programme

The Programme is responsible for: Coordination of matters pertaining to STI standards, development of policies, plans, programmes and regulations on physical, chemical and social sciences; bio sciences and bio economy. It is also responsible for strengthening collaboration and cooperation on matters of bio-economy and bio-security/safety, and coordinate implementation of policies, plans and programmes pertaining regulations in STI.

The programme planned outputs for FY2019/20 are: policies and regulations for physical, chemical, social sciences, bio sciences, and bio economy developed and monitored; 5<sup>th</sup> National Annual Bio-safety Forum organised and hosted, Inventory of institutions and laboratories undertaking biotechnology, bio safety and bio security activities established and respective research profiled; Collaboration and cooperation strengthened for STI standards and regulations; and Safety regulations in STI research developed and procedures revised.



## Performance of the Regulation Programme

The programme budget for FY2019/20 was Ug shs 4.723bn, of which Ug shs3.014bn (63.8%) was released and Ug shs2.818bn (93.5%) spent by 30<sup>th</sup> June, 2020. Release performance was fair, whereas expenditure was very good.

Under the biosafety and bio-security sub-programme, staff were trained in genetically modified organisms, and consultative meetings with zonal agricultural research officers, universities, (Kampala International University, Muni, Gulu, and Lira universities) on Biotechnology, Biosafety and Biosecurity legislation held.

The sub-programme held three planning meetings for the National Biosafety Conference. In addition, the sub-programme carried out sensitisation workshops in the districts of Gulu, Kitgum, Lamwo, Nwoya, Amuru, Agago, Pader, Omoro) Packwach, Nebbi, Zombo, Arua, Maracha, Koboka, Yumbe and Adjumani.

The programme through the Biosciences and Bio-Economy Sub-Programme catalogued bio-economic resources during the KIU Research and Innovation Conference. The sub-programme also catalogued bio-economy resources and products in the DLGs of Jinja, Iganga and Busia, Mbale, Tororo, Bugiri, Namayingo, Mayuge, Amuria, Kaliro, Buyende, Butaleja and Pallisa. A catalogue of bio-fortified products and researchers was developed. Terms of reference (ToRs) for a feasibility study on waste management were developed. Three meetings towards the development of the bio-economy policy were conducted and taskforce members identified.

An ad-hoc task force was established and ToRs developed for profiling research laboratories. TORs for feasibility study R&D in indigenous knowledge were produced. MoSTI conducted consultative meetings with academic institutions on the proposal to have the national space programme.

The project concept for the National Space Programme was developed and approved by the development committee of the Ministry of Finance, Planning and Economic Development (MFPED) to proceed to the project profile stage. The programme generated a concept note for the National Science Mentorship Programme. The sub-programme of physical, chemical and social sciences conducted consultative meetings with traditional institutions in Acholi and Bugisu sub-regions on the development of indigenous knowledge policy and institute.

In addition, the sub-programme developed ToRs for feasibility studies for R&D in indigenous knowledge, material science and nanotechnology. Table 3.2 shows performance of the regulation programme.



**Table 3.2: Performance of the Regulation Programme by 30th June, 2020**

Sub-programmes	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
Biosafety and Biosecurity	Enabling policies, laws and regulations developed	1,502,306,329	912,142,203	8.00	2.00	13.10	MoSTI staff were trained in genetically modified organisms, held three preparatory meetings for the National Biosafety conference. Held two meetings to organise the regulatory impact assessment workshop for the biosecurity bill and policy.
Biosciences and bio-economy	Enabling policies, laws and regulations developed	1,607,000,000	1,020,548,062	6.00	4.00	34.03	ToRs for feasibility study on waste management developed. Catalogue for bio-fortified products and bio-economy resources was developed. Sensitisation workshops/trainings conducted in DLGs of Eastern Uganda.
Physical chemical and social sciences	Enabling policies, laws and regulations developed	1,613,270,000	1,081,943,610	6.00	3.00	25.47	Ad-hoc taskforce for profiling research laboratories constituted. Concept notes for the national space and national science mentorship programs developed. ToRs for the feasibility study for R&D in indigenous knowledge and material science and nanotechnology developed.
Programme Performance (Outputs)						72.59	Good performance
Outcome Performance	Outcome Indicator			Annual Target	Achieved	Score (%)	Remark
	% compliance to National STI standards and guidelines			22	3	14	
	Programme Performance (Outcomes)						14
Overall Programme Performance						52.0	Fair performance

Source: IFMS, Progress Reports, and Field Findings



## Conclusion

The programme overall performance was fair (52%). The fair budget releases (63.8%) and outbreak of COVID-19 in the second half of the FY2019/20, affected implementation of planned activities. The programme outcome performance was poor at 14%, and this was due to lack of baseline data and low appreciation of STI in national development.

### 3.2.2 Research and Innovation Programme

The programme is responsible for: Coordination of multi-sectoral research and innovation activities, overseeing the development and implementation of research and innovation technology clusters, platforms, and programs. It also facilitates technology generation, assessment, transfer and adaptation, intellectual property acquisition and management and demonstration and piloting of new innovations and emerging technologies.

The programme planned outputs for FY2019/20 are: Research and Development (R&D) supported and jointly undertaken; Indigenous Innovations and technologies documented and promoted; Emerging technologies rationalised; Partnerships among artisans and other scientific knowledge interlocutors; knowledge generators (researchers) knowledge transformers (industrialists and entrepreneurs) and end users (consumers) developed; Methodologies for exploitation of Intellectual Property Rights (IPRs) developed; STI Regional Centres of Excellence established: and Infrastructure development projects undertaken and coordinated.

### Performance of the Research and Innovation Programme

The programme budget for FY2019/20 was Ug shs 130.416bn, inclusive of the supplementary budget of Ug shs 91.820bn for the National Science, Technology, Engineering and Innovation Skills Enhancement (NSTEI-SE) Project. Ug shs 125.808bn (96.5%) was released and Ug shs 125.467bn (99.8%) spent by 30<sup>th</sup> June, 2020. The release and expenditure were very good.

The programme profiled researchers and indigenous knowledge in 10 districts in the Teso, and 10 districts of West Nile sub-regions respectively. Procurement of a consultant to develop the National Research Agenda was ongoing. The programme established a thinktank to develop scientific proposals to address the outbreak of the COVID-19 pandemic. The programme through MoSTI established partnerships and collaborations with Soroti University, National Semi-Arid Resources Research Institute, and DLGs in West Nile sub-region. They revised the concept note for establishment of science and technology parks (STPs) and submitted to the Development Committee. Partnerships with, Makerere University, Busitema University, Mbarara University, Uganda Virus Research Institute (UVRI), and Natural Chemotherapeutics Research Institute to combat COVID-19 were established.

The programme trained artisans and innovators in central region involved in agro-technology and food value. The programme participated in conferences and shows like the 20<sup>th</sup> East African Community Jua Kali/Nguvu Kazi Exhibition and conference in Kigali-Rwanda, the 2019 AUTM Asia Technology Transfer Conference in Jerusalem, Israel, and The Global Sustainable Technology and Innovation Conference 2019 in Brussels. The programme profiled research and development infrastructure in key research and development centres and institutions of higher learning. A concept note on utilisation of existing regional STI infrastructure as additional COVID-19 testing facilities was submitted to the national task force.

The programme conducted an infrastructure needs assessment for artisanal miners and local mineral industrialists in the districts of Namayingo, Busia, Moroto, Mubende, Isingiro, Buhweju, Ntungamo and Kabale. Stakeholder engagements were held in districts of Lira, Otuke, Gulu, Kitgum and Soroti on the establishment of shared infrastructure for extraction of shea butter.



Ten innovators were supported to develop Intellectual Property Rights (IPRs) and 50 innovators profiled in west Nile sub-region. The programme organised one innovation and intellectual property (IP) sensitisation workshop and conducted five IP clinics/trainings, and five innovations were profiled. Table 3.3 shows the research and innovations programme performance.

**Table 3.3: Performance of the Research and Innovation Programme by 30<sup>th</sup> June, 2020**

Sub-programme	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
Research and Development	Research and Development Partnerships and collaborations initiated and fostered	1,559,000,000	910,740,991	7.00	3.30	0.90	Think-tank to develop research proposals to combat COVID-19 outbreak established. Profiled researchers, innovators and indigenous knowledge in 10 districts of West Nile and Teso sub-regions.
Technology Development	Technology, Innovation transfer and development	1,536,400,000	846,114,993	7.00	3.00	0.85	Participated in the 20th EAC Jua Kali exhibition and conference, held virtual meetings with UNIDO, Base camp Israel, UN Tech bank and UNDP to foster clean technology development, science parks and technology needs assessment.
Innovations and Intellectual Property Management	Capacity building in the innovation and IP value chain undertaken	1,594,834,000	928,626,243	5.00	3.00	1.14	Five IP clinics held in five universities in Western Uganda. Signed MoU with Grand Challenge-Canada. 10 IP policy regimes in public universities conducted.



Sub-programme	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
STI Infrastructure Development	Capacity Building	1,506,600,000	862,374,000	6.00	3.00	0.94	Comparative study report on establishment and journey of STPs in Korea submitted. STI infrastructure profiling in key research and development centres and institutions conducted. Concept on utilisation of existing regional STI infrastructure as additional COVID-19 testing facilities submitted.
Kiira Motors Corporation	Construction of Kiira Vehicle Assembly Shop Closures; Slab and roof, warehouse slab, closures and roof	12,077,264,397	12,077,264,397	100.00	80.00	6.89	Assembly shop sub and super structure completed, and roofing ongoing. Warehouse sub and super structure and roofing done.
	Draft automotive industry development policy	141,612,000	141,612,000	1.00	0.20	0.02	Draft automotive industry policy developed, however, the stakeholder consultations were stayed due to the COVID-19 lockdown.
	Electric buses and charging stations assembled and deployed	3,225,785,064	3,225,785,064	4.00	4.00	2.30	Two electric buses and two charging stations built and buses deployed to transport CAA staff during COVID-19 lockdown.



Sub-programme	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
	Kayoola bus seat engineering, chassis, web frame engineering and production samples developed	407,883,126	-	100.00	40.00	0.00	Developed the Kayoola EVS chassis and web frame engineering drawings and registered 5 trademarks and two utility models.
	General Office Administration	4,555,338,539	5,237,134,847	100.00	100.00	2.82	KMC stock handed over to MoSTI from UDC. Key stakeholder engagements conducted and KMC Jinja and CHTC plant facilities in China. Staff salaries and utilities paid.
National Science, Technology, Engineering and Innovation Skills Enhancement Project	Government Buildings and Administrative Infrastructure	1,500,000,000	1,200,000,000	4.00	1.00	0.33	Cadastral and topographic surveys and schematic designs for TIBIC completed and approved. Supervision consultant for civil works for TIBIC Namanve procured
	Research and Development	102,300,000,000	100,739,931,300	100.00	30.00	22.21	ToRs for environment and social management and monitoring plans developed. Supervision consultant for civil works procured. Project communication and dissemination plans developed. Recruitment plan for contract staff developed and project management team recruited.



Sub-programme	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
							ToRs for a consultant to develop instruction curriculum developed and procurement of the consultant was ongoing. Most of the activities were at initial stages by 31st July 2020 and civil works for both centres had not started in spite of funds being transferred to the contractor
	Purchase of office & ICT equipment and residential furniture	420,000,000	320,000,000	4.00	2.00	0.20	ICT equipment procured and installed. Installation of furniture and fittings was deferred to FY2020/21.
Presidential Initiative on Banana Industrial Development	Operationalisation of the BIRDC model and recruitment of adequate human resource	5,800,000,000	5,800,000,000	100.00	70.00	2.89	BIRDC was registered as a company, staff salaries and plant overheads paid. The governance framework for BIRDC was not concluded.
	Commercialisation of banana pilot plant and certification of the processing and laboratory framework, continuous product development and research	3,143,000,000	3,143,000,000	12.00	3.00	0.56	A total of 37 and 11MT of instant and raw Tooke chips respectively were processed. Five research outputs were under patent registration process. Certification of products was not achieved. Most of the planned activities were not implemented



Sub-programme	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
	Global supply chain development and operationalization and continuous local market development	557,000,000	557,000,000	4.00	1.00	0.10	Formed five school Tooke clubs to promote the product locally. 11 cooperatives supplied 480MT of green bananas. Marketing activities were hindered due to lack of Q mark and restrictions on movement due to outbreak of COVID-19 and lockdown in Q4 FY2019/20.
Sericulture project	Construction of grainage, rearing, reeling and re-reeling facilities	1,714,000,000	1,348,100,000	4.00	2.80	1.09	Civil works for grainage, rearing, reeling, re-reeling facilities at Rubare and Namasumbi stations was at roofing stage.
	Sericulture equipment purchased and installed	800,000,000	627,000,000	100.00	30.00	0.22	Specification for post cocoon, reeling and re-reeling equipment were developed and an advance payment made to the contractor
	Mulberry gardens established, research and capacity built	3,521,000,000	2,357,438,196	100.00	80.00	2.51	A total of 136 acres of mulberry were established on station and satellite stations. 402 acres established on individual farms. Three staff trained in silk worm egg production.



Sub-programme	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
	General Office Administration	3,965,000,000	3,205,000,000	100.00	70.00	2.45	A total of 45 staff recruited, 47 partnerships formed for sericulture development and marketing. Two study visits to Japan and China. Draft curriculum for an academic program in sericulture developed.
Programme Performance (Outputs)						42.14	Poor performance
Outcome Performance	Outcome Indicator			Annual Target	Achieved	Score (%)	Remark
	% of MDAs trained on STI			20	12	60	
	Programme Performance (Outcomes)					60	
Overall Programme Performance						48.4	Poor performance

Source: IFMS, MDAs

### 3.2.2.1 National Science, Technology, Engineering and Innovation Skills Enhancement Project (NSTEI-SEP)

The goal of the project is to ensure Ugandans design, implement and manage key infrastructural projects and create globally competitive businesses. The project will support: Scientists and innovators, Ugandan graduates, craftsmen, technicians and engineers to participate in the development and establishment of national infrastructure projects. The objectives of the Project are to:

1. Establish the National Science, Technology and Engineering Skills Enhancement Centre (NSTESEC), and Technology Innovation and Business Incubation Centre (TIBIC) to enhance STEI Skills development, and promote STEI based enterprise development among graduates, craftsmen, technicians, engineers as well as other scientists and innovators.
2. Re-tool graduates, craftsmen, technicians and engineers and equip them to undertake various infrastructural works (electricity distribution, water drilling and distribution, road construction, building construction, pipeline construction, light railway construction, etc.) to promote local content, generate employment and create wealth.





3. Establish technology, innovation and business incubation facilities including workspaces and common-user facilities for scientists and innovators to help them further develop their technologies and business models.

The five-year project was anticipated to start in FY2016/17 to FY 2020/21, however financing was concluded in FY2018/19 with a loan from the China Exim Bank and counterpart funding from GoU. Therefore, the project effectively started in FY 2019/20.

### Performance

The project budget for FY2019/20 was Ug shs 104,220,000,000, of which Ug shs 102,259,931,300 (90%) was released and all spent by 30<sup>th</sup> June, 2020. Most of the received funds were advanced to the contractor for civil works, supply of equipment and loan insurance (Ug shs 91.82bn). The project acquired 45 acres of land in Nyakasharara, Kiruhura District for construction of the NSTEIC. The cadastral and topographic surveys for TIBIC-Namanve were done, while those for the new NSTEIC site were ongoing by August 2020. The project steering and inter-ministerial committees were constituted. The draft communication and dissemination plan was developed. ToRs for environmental and social impact and monitoring plan, and the framework for equipment and machinery surveys were developed.

The supervision consultant for civil works at TIBIC-Namanve was procured, while procurement of a consultant to develop an operational plan and management guidelines for NSTEIC and TIBIC was ongoing. By 31<sup>st</sup> July 2020, civil works had not started at the proposed sites. The project experienced delays in constituting a management team and procurement of a consultant for the environment social impact assessment. The project experienced land related challenges due to encumbrances on the existing land owned by UNCST in Sanga–Kiruhura which necessitated a change to an alternative site donated to the project in Nyakasharara. The outbreak of COVID-19 and subsequent lockdown including border closures restricted movement of the key staff of the contractor from travelling from China to Uganda. The project was behind schedule amidst Ug shs 91.82bn advance payment to the contractor.

#### 3.2.2.2 Kiira Motors Corporation (KMC)

Established in 2014, Kiira Motors Corporation (KMC) intends to set up the first automotive manufacturing plant in Uganda. The KMC investment is thus poised to catalyse innovations and industrialization leading to savings in foreign exchange; economic diversification; attraction of foreign direct investment and development of skills relevant for developing a sustainable automotive value chain in Uganda. In 2018, Cabinet approved a disbursement plan for the commercialisation of the Kiira Electric Vehicle Project over a period of four years as follows: Ug shs 24bn for FY 2018/19, Ug shs 44bn for FY2019/20; Ug shs 43bn for FY2020/21 and Ug shs 32.7bn for FY 2021/22.

During FY2019/20, the approved budget for Kiira Motor's Corporation was Ug shs 20bn (over 50% below the agreed disbursement plan) and all was released. The KMC had Ug shs 681,796,308 brought forward from FY2018/19. In addition, the corporation received Ug shs 75,925,175 from the Resilient African Network (RAN) for development of an open design low cost medical ventilator. Therefore, the available funds to KMC during FY2019/20 were Ug shs 20,757,721,483 which was all spent by 30<sup>th</sup> June, 2020.

### Physical performance

Construction of the Kiira vehicle assembly shop, plant start-up facilities-Phase I and plant offices was ongoing and the following achievements were done during the period under review: The assembly shop



sub and super structures were completed, and the building was being roofed in August 2020. The contract for design of body shop, paint shop, electrophoresis shop and chassis line was signed.

Construction of the Kiira Vehicle Plant Warehouse: The building was roofed, while shuttering, and casting of the floor slab were ongoing.

Five kilometers of the 6.4km of the plant circulation roads opened. Construction of the 2.79km dual carriage principal and classified road was at 70% progress. The activity was behind schedule due to expiry of the contract for the consultant. Routine maintenance of the 1.7km open storm water channel was done. Civil works for the Kiira Vehicle Plant start-up facilities was at 50% progress.

Two Kayoola Electric buses (EVS) and two charging stations were built. Development of the assembly manual and knitting plan was completed. KMC partnered with Britam Insurance Company Limited for the comprehensive insurance cover of the Kayoola EVS. KMC was engaging Uganda Revenue Authority (URA) for a better tax treatment for the buses under Research and Development. The KMC signed a commercial contract with CHTC-China for supply of the Kayoola diesel bus kits and portable chargers. The KMC installed two level 3 chargers at Luwero Industries and Victoria Motors respectively.

Using financial support from RAN, the KMC developed an engineering and three validation prototypes of the low cost ventilator. This was in response to the outbreak of COVID-19 in the country.

Five trademarks were issued by the Uganda Registration Service Bureau (URSB) to KMC and these include; Kiira EV, Kiira EVS, Kayoola EVS, KMC and Kiira Plant. KMC submitted applications to URSB for the industrial design for Kiira EVS and utility model for 8+ seat for the Kayoola bus. KMC applied to International Society for Automotive Engineers for a Uganda World Manufacturer's Identifier (vehicle identification number) system.

KMC got clearance from Ministry of Finance for a multi-year contract with CHTC Motors Co Ltd. All the KMC stock was transferred from UDC to MoSTI. The financial and accounting management manual and back to work handbook in response to COVID-19 were drafted.

The MoSTI was constituting a Board of Directors for KMC. The overall project performance was good, but behind schedule.



**L-R: Vehicle assembly shop, plant and warehouse under construction at Jinja IBP**



## Challenges

- The heavy and prolonged rains in the second season of 2019 that extended into 2020 affected progress of construction works.
- Under funding in relation to the approved roadmap for KMC is derailing execution of activities.

## Recommendation

- The KMC and MoSTI should enhance stakeholder engagement to appreciate the roadmap and the associated timelines for the commercialisation of the Kiira Electric Vehicle Project and vehicle assembling plans.

### 3.2.2.3 Banana Industrial Research and Development Centre

Formerly known as the Presidential Initiative on Banana Industrial Development (PIBID). The Agency started in 2005 as a pilot project of the Government of Uganda (GoU) whose underlying theory is that rural farmers with access to science led processing and value addition enterprises will be able to rapidly access profitable market chains, that supply local, regional and international markets; resulting into increased household incomes. It was anticipated that the project would be a catalyst for socio-economic transformation through research based crop value addition. Over Ug shs 150bn has so far been injected in the project since inception.

The project is in tandem with the Government's priority economic strategies in the Second National Development Plan (NDP II), which among others include: value addition to agricultural products and agro-processing through Research and Development (R&D).

In FY 2019/20, the project was expected to transit into a Banana Industrial Research and Development Centre (BIRDC), acquire the International Standards Organization (ISO) and UNBS certification, install additional equipment, operationalise the laboratories, and commercialise *Tooke* products, map production capacities of farmers and undertake countrywide soil resource testing among others.

### Performance of the BIRDC

The agency budget for, FY2019/20 was Ug shs 9.5bn, all of which was released and spent by 30<sup>th</sup> June 2020. The agency however had unaudited arrears amounting to Ug shs 8.9bn. A total of Ug shs 1.439bn of the released funds were used to clear some of the arrears accrued from supply of raw materials to the pilot plant.

The Banana Industrial Research and Development Centre (BIRDC) was registered as a company in fulfillment of the strategy for operationalisation of the Presidential Initiative on Banana Industrial Development. A taskforce was constituted to develop the governance framework for BIRDC but due to the outbreak of COVID-19 and the subsequent lockdown, some of the committee activities were not carried out. Efficiency optimisation studies for the primary processing of bananas were ongoing. The company was in the final process of acquiring a UNBS quality distinctive mark. Commercialisation of research laboratories awaited accreditation from UNBS. Marketing the products was ongoing within and outside the country at a low scale due to lack of a quality mark and lockdown. The peeling machine and a sugar mill were installed. The pilot plant processed 37 and 11MT of instant *Tooke* flour chips and raw *Tooke* chips respectively during the period under review amidst plant production capacity of 10MT per day.

It was observed that most of the planned activities were not implemented and the pilot plant was far from running on a commercial scale due to poor prioritisation and inadequate funding.



L-R: Raw toke chips in sacks, and finished Tooke biscuits in store at Nyaruzinga- Bushenyi

### 3.2.2.4 Sericulture Project

Located in Sheema and Mukono districts, the project aims at increasing production of silk and promotion of sericulture technologies in Uganda. The intervention is a subvention under the MoSTI that had previously been supported under the Innovation Fund. The project has 17 satellite stations/gardens across the country to promote sericulture. During the period under review, the project received Ug shs7.537bn and Ug shs 8.634bn was spent by 30<sup>th</sup> June, 2020 representing 114.6% of the released funds. The project expenditure was more than the released funds. The owners reported that they secured additional funding as part of owner's equity. Even though sericulture is considered a development project, it was observed that during the period under review, 70% of the expenditure was on recurrent activities.



L-R: Silk worm rearing and processing facility at Namasumbi Station-Mukono District and Rubare Station -Sheema District

By August 2020, construction of the silk worm rearing houses at Rubaare and Namasumbi stations were at roofing level. Specifications for establishing and operationalising a complete line of next generation equipment for post cocoon technologies and innovations was completed and the contract to manufacture, install and build capacity of Ugandans to operate the processing line finalised.



A total of 136 acres of mulberry were established in nine districts of Sheema, Bulambuli, Kamuli, Mukono, Iganga, Bukedea, Zombo, Pallisa and Busia. The mulberry at Rubare- Shema District and Namansumbi- Mukono District were at harvesting stage. A total of 402 acres of mulberry were established and rehabilitated at farmers' gardens in 17 districts. A total of 1,203 farmers were trained in various sericulture technologies and innovations. The project recruited 45 staff and three of them were trained in silk worm egg production. A total of 33 extension workers were trained in silk worm rearing. It was observed that the project activities kept changing during the year and the project was not yet approved by the Development Committee.

### 3.2.2.5 National Research and Innovation Programme Framework

The National Research and Innovation Programme (NRIP) framework was approved by Cabinet and it was operationalised during the period under review. The framework replaces the Innovation Fund that originally supported scientists working with the Uganda National Council of Science and Technology (UNCST). The MoSTI received Ug shs 9.53bn for the National Research and Innovation Programme framework for the FY2019/20. Ug shs 4.298bn was disbursed to 14 grantees supported by the inaugural Innovation Fund in the FY2017/18. Ug shs 5.23bn was re-allocated to the Presidential Initiative for Epidemics to procure equipment and reagents for COVID-19 research. The funds were disbursed in the last quarter of the FY and implementation generally started in Q1 FY2020/21. On 29<sup>th</sup> June 2020, the ministry got a supplementary budget worth Ug shs 32bn as additional support to scientists on COVID-19 related research, however, the money was refunded to the consolidated fund and re-voted for use in FY2020/21.

**Table 3.4: Utilisation of the NRIP Framework Funds by 30<sup>th</sup> June, 2020**

Project PI and address	Project title	Grant amount (Ug shs)
Dr. Louis Mukwaya, UVRI	The Discovery and Development of Indigenous Microbial Mosquito Larval Pathogens for Malaria Vector Control in Uganda	200,000,000
Mrs. Edith K. Isharaza P.I Rev. Justus Murokore Biryomumeisho	Production and Industrial Application of Phytolacca Dodecandra (PD) to control vector borne diseases (Snailtox)	348,000,000
Mr. Paul Kimera	Up-Scaling the Production and Commercialization of Makapads	150,000,000
Mr Niwagaba David	Fresh Vacuum Sealed Matooke (FREVASEMA) Research Project	100,000,000
Prof. William Kyamuhangire,	Integrated Banana Juice Factory in Uganda Project (Eshande) Juice	250,000,000
Prof. Miph Musoke	Oluwoko versus Malaria Project	200,000,000
Mr. Najjuka Kano	Commercialization of local Banana Juice (Eshande) Production to answer Industrial Raw Material Demand	600,000,000
Prof. John David Kabasa,	Scaling-Out of SPEDA Innovation	700,000,000
Prof. Joseph K. Byaruhanga,	Low Cost Solar Irrigation Water Pumps	300,000,000
Mr. Paul Sserumaga,	Production of tropical fruit wines for improved rural house hold incomes and reduced post-harvest losses of fruits	250,000,000



Ms. Tracie Namanya	Up-Scaling the Production and Distribution of Bugalama Super Banana Wine	200,000,000
Dr. Evelyne Isingoma,	Production of Nutrient Dense Composite Flours for complementary feeding solutions to fight infant malnutrition in Uganda	200,000,000
Mr. Ivan Okori,	Improving Livelihoods of Rural Communities Through Cassava Processing and Value Addition	560,000,000
Mr. Mugarura Samuel	Tear Gas Product Development and Prototype Standardization	220,000,000
Prof Moses Joloba	The PCR and anti-body diagnostic kits	3,705,942,922
Dr. Jennifer Serwanga UVRI, Entebbe	Inactivated COVID-19 Vaccine Development	972,556,900
Dr. Sheila Balinda UVRI, Entebbe	COVID-19 Adeno Vector Vaccine	252,437,000
Prof. Enock Matovu Makerere University COVAB	COVID-19 Subunit Vaccine	322,194,400
Dr. Grace Nambatya Natural Chemotherapeutics Research Institute - Wandegeya	Production and Clinical trial of therapeutic herbal drugs against COVID-19	Received equipment from MoSTI
<b>TOTAL</b>		<b>9,531,131,222</b>

## Conclusion

The overall programme performance was poor at 48.4%. The programme outcome performance was fair at 60%, while the output performance was poor at 42.1%. This was attributed to the low delivery on NSTEISEP which constitutes 74% of the programme budget. Civil works for the TIBIC and NSTEIC had not begun due land related challenges and the COVID-19 lockdown that restricted movement of the contractor's key staff from China to Uganda. The PIBID reportedly accrued unverified arrears in previous FYs and part of the released funds were used to settle these arrears thus affecting execution of planned activities. The commercialisation of the pilot plant and research laboratories was never achieved in FY2019/20. The KMC and sericulture projects posted better performance in comparison to the other sub-programmes. However, the Sericulture Project had not gone through the project approval process. There is need for MoSTI to have a clear agreement or MoU with Tropical Institute of Development Innovations (TRIDI) to protect and safe guard public resources and assets thereof.

### 3.2.3 Science Entrepreneurship Programme

The programme facilitates Science, Technology and Innovation skills development for artisans, innovators and researchers. It is responsible for creating a critical mass of highly trained and skilled Science Technology and Engineering (STE) professionals to drive industrialisation and economic growth. It facilitates establishment of product development facilities and innovation hubs, liaison with financial intermediaries for technology acquisition and access to credit for STI based SMEs, and fostering linkages and partnerships between STI institutions (universities, technical, and vocational) and industrialists as well as Public sector (Ministries, Departments and Agencies).

The planned outputs for FY2019/20 include: Needs based assessment, comparative analysis and adoption of appropriate models for technological enterprise development undertaken spin off and start up technology enterprises supported; Technology uptake, adoption and diffusion initiatives supported; Skills



development on technology uptake, commercialization and enterprise development undertaken; ST&I business mentorship undertaken; Frameworks, policies and guidelines for Technology adoption, diffusion and commercialisation developed and public and private sector collaborations and investment in ST&I Commercialisation strengthened.

## Performance

The programme approved budget for FY2019/20 was Ug shs5.078bn, of which Ug shs 2.872bn (56.6%) was released and Ug shs2.627bn (91.5%) spent by 30<sup>th</sup> June, 2020. The release performance was fair, while expenditure was very good.

The programme conducted technopreneurship consultative meetings with innovators and entrepreneurs and profiled commercially viable technologies in Sheema, Masaka, Ssembabule, Nakaseke, Bushenyi and Mubende DLGs.

The programme held meetings with stakeholders in Pader, Agago, Nebbi and Moyo districts to promote the commercialisation of shea butter. Business skills needs assessment in essential oils and mushroom production were carried out in Bukedi sub-region. The programme through MoSTI organised the Bunyoro Youth Innovation Awards, in Masindi District and supported the Top 100 SMEs awards programme in Kampala.

The programme participated in the 20<sup>th</sup> East African Community (EAC) *Jua- Kali* exhibition in Kigali, Rwanda and commemorated the World Science Day. Collaborations and partnerships were established for STI Advancement with Italian Embassy, United Nations Educational, Scientific and Cultural Organisation (UNESCO), YIYA Solutions, E2 young engineers, KPMG and World Vision Uganda. The Technical and Vocational Education and Training (TVET) skills competitions were held in four regions of Uganda.

**Table 3.5: Performance of the Science Entrepreneurship Programme by 30<sup>th</sup> June, 2020**

Sub-programmes	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
Technology Uptake, commercialization and enterprise development	Technological enterprise developed	1,036,600,600	691,405,417	3.00	1.00	10.33	Conducted consultative meetings DLGs and profiled commercially viable innovations. Technology uptake, adoption and diffusion not supported.
	Industrial Skills Development and capacity Building	350,000,000	83,326,518	2.00	1.00	6.98	Entrepreneurial skills trainings and consultative meetings conducted among Shea butter stakeholders in Teso and West Nile sub-regions.
	Support Scientific and innovations	500,000,000	207,069,315	2.00	0.30	3.61	Task force to formulate guidelines and standards for technology transfer and commercialisation constituted and ToRs approved.



Sub-programmes	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
Skills development	Industrial Skills Development and capacity Building	1,193,844,000	833,883,691	4.00	2.00	17.03	A total of 100 innovators from Lango sub-region were trained in oil seed standardisation. Bunyoro Youth Innovation Awards supported. Participated in the 20 <sup>th</sup> EAC Jua-Kali exhibition.
	Support Scientific and innovations	400,000,000	187,590,339	2.00	0.50	4.25	Supported TVET skills competitions in four regions of the country. Six leather processors were profiled.
Advancement and Outreach	Industrial Skills Development and capacity Building	1,536,400,000	846,114,993	5.00	1.00	11.12	World Science Day commemorated and National STI Conference conducted.
<b>Programme Performance (Outputs)</b>						<b>53.32</b>	Fair performance
Outcome Performance	<b>Outcome Indicator</b>			<b>Annual Target</b>	<b>Achieved</b>	<b>Score (%)</b>	<b>Remark</b>
	% increase in transfer, adoption and uptake of technologies			2	1	50	
	<b>Programme Performance (Outcomes)</b>						<b>50</b>
<b>Overall Programme Performance</b>						<b>52.2</b>	Fair performance

Source: IFMS, MoSTI Progress Report, and field findings

## Conclusion

The overall programme performance was fair at 52.2%. Both the outcome and output performances were fair at 50% and 53.3% respectively. This average performance was largely attributed to the low budget releases (56.6%). The outbreak of COVID-19 stayed most of the planned activities in Q3 and Q4 that required stakeholder engagements. In order for the programme to contribute significantly to the development of a sustainable industrial economy, there is need for the sector to develop and implement formal mechanisms to facilitate technology transfer and adoption from researchers to industrialists for commercialisation. In addition, the sector should develop and implement a national STI advancement and outreach strategy.





### 3.3 Uganda Industrial Research Institute (UIRI)

#### 3.3.1 Background

The Uganda Industrial Research Institute (UIRI) is the lead agency for the promotion of Industrialisation in Uganda. The institute is an agency under the Science, Technology and Innovations Sector. UIRI traces its roots to the East African Federation of the 1970s, as a precursor of the then East African Research Organization (EARSO) which was headquartered in Nairobi, and served as a regional Research and Development (R&D) institution for Kenya, Tanzania and Uganda. Upon the collapse of the East African Federation, the EARSO was disbanded in 1997, and later transformed into the Kenya Industrial Research and Development Institute. The establishment of UIRI was at the behest of GoU negotiations with the Chinese Government which offered a grant to build and equip the institute.

#### Objectives

UIRI's primary objectives are:

- To carry out applied research for the development of products and provide platform for innovations, application of science and technology.
- To develop and acquire appropriate technologies in order to create strong, effective and competitive private sector.
- To promote value addition activities so as to transform local raw materials into competitive marketable products.
- To bridge the gap between academia, government and the private sector and to enhance commercialization of R&D.

#### Planned Outputs for FY 2019/20

The planned deliverables for UIRI for FY2019/20 were to: undertake skills development of industrialist, design and develop hardware and analyse prototypes, purchase office equipment and specialised machinery, produce and market Newcastle vaccines, support incubation activities at headquarters and satellite facilities, and construction, equipping and operationalisation of the Machining Manufacturing Industrial and Skilling Centre (MMISC) in Namanve.

#### 3.3.2 Industrial Research Programme

The approved budget for UIRI, FY 2019/20 was Ug shs 14.23bn and in the course of the financial year, the vote got a supplementary budget of Ug shs 10bn, thus increasing the annual budget to Ug shs 24.23bn and all was released. Ug shs 24.213bn (99.9%) was spent by 30<sup>th</sup> June, 2020. Both release and expenditure performance were very good. It was observed that 66% of the expenditures were on administrative and other recurrent items.

#### Project: 0430 Uganda Industrial Research Institute

Development and testing of the *Wendi* mobile application aimed at easing public transport was ongoing. The UIRI conducted a pediatric study on the performance of the Electronically Controlled Gravity Feed (ECGF) system. Formation of partnerships with Fraunhofer Gesellschaft Institute of Germany for technical support and mass production of the units was ongoing. The ECGF machine passed the IP searches by URSB, and UIRI procured a legal service firm to file the patent corporation treaty with the World Patent and Trademarks Office (WPTO). The UIRI developed a method for production of lactic acid from cassava.



Product formulations for instant hand sanitisers, anti-bacterial soaps and detergents were developed. The agency developed prototypes of a non-alcohol hand sanitisers and antiseptics using Chlorhexidine acetate and Benzalkonium chloride. Research on use of cotton stalks for cultivation of oyster mushrooms was ongoing. The UIRI also designed a prototype of a solar water heating system in partnership with Makerere University.

Construction of the **Machining and Skilling Centre (MMISC) at the Kampala Industrial and Business Park - Namanve** with a US\$30 million grant from the People’s Republic of China was completed and commissioned in January 2020. The facility is expected to provide practical training to a total of 200 students (technicians) in standard machining, robotics, and Programmable Logic Control (PLC) among others. Installation of equipment in all workshops was completed. The high voltage power line along the fence of MMISC was reinforced with lined drainage and civil works were ongoing. The COVID-19 lockdown restricted movement of the Chinese instructors into the country, therefore actual training had not started.

In response to the COVID-19 outbreak, one of the workshops was remodeled to house the textile machinery. The UIRI procured 120 straight stitching machines for production of re-usable cloth masks and two autoclaves for sterilising medical masks. By 30<sup>th</sup> August 2020, the agency had a production capacity of 15,000 pieces of re-useable facemasks (three layered) per day. In addition, three lines with a production capacity of 240 disposal facemasks per minute were procured and one line was being installed, while the other two were in transit.



L-R: Disposable/medical facemask line, straight stitch sewing machines for production of reusable facemasks, some of the equipment installed in the mechatronics workshop and stone pitched drainage works at Namanve



### 3.3.3 Headquarters

At UIRI headquarters, 17 staff were recruited and a number of facilities were undergoing renovation. Construction of the container platform for wine production was ongoing. The UIRI provided technical support to entrepreneurs in value addition to dairy (yoghurt, cheese), fruits (jam, marmalades, wines and sauces), peanut and cow horn and 80 samples were analysed.

The UIRI trained 33 students from Uganda Christian University (UCU) in value addition; 35 female farmers from Kalungu District in dairy processing; and 26 people from Kampala in tailoring, knitting and embroidery. Training of entrepreneurs was disrupted in Q4 due COVID-19 outbreak and the subsequent lockdown. Table 3.6 shows the performance of the Industrial Research Programme by 30<sup>th</sup> June, 2020.

**Table 3.6: Performance of the Industrial Research Programme by 30<sup>th</sup> June, 2020**

Sub-programmes	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score	Remark
Headquarters	Administration and support services	16,220,568,885	16,220,568,885	100.00	100.00	66.94	Paid salaries and benefits for 302 staff. Recruited 17 staff. Institute assets were insured. Institute machinery and buildings maintained
	Arrears	788,206,175	788,206,175	100.00	100.00	3.25	Arrears accrued during FY2018/19 cleared
Project: 0430 Uganda Industrial Research Institute	Research and development	1,488,660,000	1,488,660,000	4.00	3.10	4.76	Developed formulations for instant non-alcoholic hand sanitizer, anti-bacterial soap and detergents. Developed solar water heater prototype in collaboration with Makerere university. Filed for a patent for the ECGF machine and baby warmer/incubator. Developed a protocol for production of lactic acid from cassava.
	Government Buildings and Administrative Infrastructure	500,000,000	500,000,000	2.00	1.50	1.55	Painted administration block and laboratories at Nakawa and stone pitching of side drainage channel at MMISC Namanve was ongoing. Itojo Pineapple Juice Plant was commissioned.
	Purchase of Office and ICT Equipment, including Software	1,150,000,000	1,150,000,000	100.00	100.00	4.75	Procured assorted ICT equipment.



	Purchase of Specialized Machinery & Equipment	4,082,500,000	4,082,500,000	4.00	3.00	12.64	Procured 120 industrial straight stitching machines, two autoclaves and assorted textile testing equipment. Procured four vehicles (three pickups and one minibus)
Programme Performance (Outputs)						93.89	Very good performance
Outcome Performance	Outcome Indicator			Annual Target	Achieved	Score (%)	Remark
	Number of Research Innovations developed			5	5	100	
	Number of developed and transferred Technologies utilized			6	6	100	
	Cumulative Number of Sustainable Model Value Addition Centers and Technical Business Incubation Enterprises			4	0	0	Support was provided to three already existing value addition centres
	Programme Performance (Outcomes)					67	Fair performance
Overall Programme Performance						84.4	Good performance

Source: IFMS, MDAs

## Conclusion

The programme overall performance was good at 84.4% and the interventions were consistent with the NDPII theme of strengthening Uganda's competitiveness for sustainable wealth creation, employment and inclusive growth. The supplementary funding to UIRI during the year was a step towards the operationalisation of the Manufacturing, Machining Industrial Skilling Centre (MMISC). The programme registered five innovations during the year that were yet to be commercialised. However, challenges like low technology transfer, and commercialisation of innovations were experienced. The outbreak of COVID-19 restricted movement of instructors from the People's Republic of China to Uganda to start training of trainers (ToTs) for the MMISC.

## Recommendations

- The UIRI should continuously engage with stakeholders and the public about the innovations and services offered.
- The UIRI through MoSTI should develop a national technology transfer and adoption strategy to aid commercialisation of innovations.

## 3.4 Overall Sector Performance

The STI sector performance was fair at 59.2%. Most of the re-current sub-programmes exhibited good performance, while the development component performed fairly. Poor performance was noted under the sector outcomes. Table 3.7 shows the sector overall performance by 30<sup>th</sup> June, 2020.

**Table 3.7: STI Sector Performance by 30<sup>th</sup> June, 2020**

Programme	Output	Outcome	Overall (%)
Regulation	72.59	14	52
Research and Innovation	42.14	60	48.4
Science Entrepreneurship	53.32	50	52.2
Industrial Research	93.89	67	84.4
Average performance	65.5	47.5	59.2

Source: Author's compilation



## CHAPTER 4: CONCLUSION AND RECOMMENDATIONS

### 4.1 Conclusion

The Science, Technology and Innovation (STI) Sector mission of providing leadership, an enabling environment and resources for scientific research and knowledge-based development for industrialisation, competitiveness and employment creation, leading to a sustainable economy, is in tandem with the country's Vision 2040 and NDP II. If well facilitated, and well prioritised, the STI sector is capable of contributing to the industrialisation and economic growth of Uganda.

The overall STI sector performance was fair at 59.2%. Some achievements included: MoSTI drafting the National STI Policy, and the Bio-Economy Policy and Draft Gender and Equity Strategy for the sector. Under the NSTEIEP project, the ToRs for the environmental and social impact assessment and monitoring plans were developed, and a consultant for supervision of civil works. The site for the NSTEIP was changed from Sanga to Nyakasharara due to encumbrances on the first proposed site, however, civil works on the two project sites of Nyakasharara (NSTEIC) and Namanve (TIBIC) had not started. The project was more than 10 months behind schedule.

Good progress was observed under Kiira Motors Corporation with the construction of the Vehicle Assembly shop facilities phase 1 at 50% progress (roofing stage). Two Kayoola EVS buses and two charging kits were built and tested.

Construction of the grainage, silk worm rearing, reeling and re-reeling facilities under the Sericulture Project was at 70% progress. It was observed that the project had not been approved by the MFPED Development Committee and did not have a project code.

The Banana Industrial Research and Development Centre (BIRDC) was registered as a company in fulfillment of the strategy for operationalisation of the Presidential Initiative on Banana Industrial Development, however, the commercialisation of the pilot plant and research laboratories was not achieved.

Under UIRI, the construction and equipping of the Manufacturing, Machining and Industrial Skilling Centre (MMISC) at the Kampala Industrial and Business Park-Namanve was completed. One of the workshops was remodeled to house textile equipment and was used to manufacture facemasks in response to the COVID-19 outbreak. Recruitment of trainers for the facility was done, but their training had not started due to the lockdown that affected movement of instructors from China.

The sector is faced with poor prioritisation of key STI interventions, leading to low achievement of sector outputs and outcomes, and delayed implementation of projects. The sector working group should rationalise the limited resources to the most critical requirements of the sector and work with MFPED to identify alternative sources of funding to meet its objectives.



## 4.2 Overall Sector Challenges

- i) The sector is faced with infrastructure gaps to undertake science, technology and innovations from research to commercialisation.
- ii) Low uptake of scientific research findings and lack of entrepreneurship skills.
- iii) Poor planning and inadequate appropriation on the sector development budget for FY 2019/20.
- iv) Low preparedness to implement development projects.
- v) Delayed commercialisation of the banana pilot plant at PIBID.
- vi) The lockdown due to the COVID-19 outbreak restricted implementation of planned activities.
- vii) The sericulture project in spite of posting good progress was not approved by the MFPED Development Committee and lacks clear terms and conditions between Government and other stakeholders.

## 4.3 Recommendations

- i) The STI Sector Working Group should prioritise funding for development activities for STI infrastructure like STI parks, and KMC to facilitate innovations and timely completion.
- ii) The MoSTI should develop and implement a national technology transfer and adoption strategy to aid commercialisation of innovations and enhance public engagements to appreciate the role of STI in national development.
- iii) The MoSTI should enhance capacity of implementing agencies to avoid project delays.
- iv) The MoSTI should approve the governance board for KMC and PIBID. and separate research from pilot plant activities.
- v) The MoSTI should lead the process of the sericulture project becoming a public investment project with clear objectives, activities, outputs, outcomes and timeframe.



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