



# **SCIENCE, TECHNOLOGY AND INNOVATIONS SECTOR**

## **SEMI-ANNUAL BUDGET MONITORING REPORT**

**FINANCIAL YEAR 2020/21**

APRIL 2021

Ministry of Finance, Planning and Economic Development  
P.O. Box 8147, Kampala  
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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
NDPIII	National Development Plan III
NSTEISP	National Science, Technology Engineering and Innovation Skills Enhancement Project
PIBID	Presidential Initiative on Banana Industrial Development Project
PRESIDE	Presidential Scientific Initiative on Epidemics
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

This Financial Year 2020/21 marks the first year of implementation of the third National Development Plan (NDPIII), within which we aim to achieve inclusive growth, employment and wealth resulting from sustainable industrialisation. It is hoped that the newly adopted coordinated programmatic approach will be a springboard to enabling government achieve its development objectives.

The semi-annual findings by the Budget Monitoring and Accountability Unit (BMAU) show that sectors still posted a fair performance. Whereas the Ministries, Departments, Agencies (MDAs), and Local Governments (LGs) should have adopted Programme Based Budgeting (PBB) this Financial Year, this is yet to be fully embraced as evidenced from the BMAU findings where entities are still operating and reporting achievements in sector format.

It is imperative that the lead agencies under all programmes ensure that all their constituent entities shift to the new development approach for us to harness its collective gains.

**Patrick Ocailap**

Ag. Permanent Secretary/Secretary to the Treasury



## EXECUTIVE SUMMARY

### Introduction

This Science technology and Innovations (STI) Sector coordinates all activities and programs relating to research, science, technology and innovation. The sector has two votes and three subventions (Vote 023: Ministry of Science, Technology and Innovations, 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) in transition to Banana Industrial Research and Development Centre (BIRDC). The semi-annual monitoring for FY2020/21 covered all the above votes and subventions.

### Financial Performance

The STI sector budget for Financial Year (FY) 2020/21 is Ug shs 277.195billion (bn) of which Ug shs 119.980bn (43.3%) was released and Ug shs 95.44bn (79.5%) spent by 31<sup>st</sup> December, 2020.

### Highlights of Sector Programme Performance

#### The Regulation Programme

The programme carried out preliminary consultations on the development of a Bio-Security Bill and conducted sensitisation radio talk shows on bio-security and bio-safety in eastern, western and northern regions. The programme finalised the Bio-Economy Policy draft and held consultative meetings on the development of Biotechnology and Bio-Safety Communication Strategy. The regulatory impact assessments (RIA) were undertaken for the development of indigenous knowledge and Space Science and Technology (SST) policies. The programme initiated collaborations in SST with South Africa, Kyutech-Japan, Egypt, Kenya and Airbus-United Nations Office for Outer Space Affairs (UNOOSA) regional project.

#### Research and Innovation Programme

The programme provided technical support to 14 innovators and developed a concept note for the National Technology Development and Transfer Framework. In collaboration with the Consortium for Enhancing University Responsiveness to Agribusiness Development (CURAD), National Agriculture Research Organisation (NARO) and Makerere University researchers developed a sweet potato value chain technology transfer. The programme submitted a concept note to Green Climate Fund on establishment of a Climate Science Institute and compiled a draft catalogue for STI infrastructure. The programme supported two institutions in development of the intellectual property policy and 15 walk in innovators were provided technical support.

Under the National Science Technology Engineering and Innovation Skills Enhancement Project (NSTEISEP), the environment social impact assessment; cadastral, topographic and



hydrological surveys for the NSTEISEP at Rwebitete, Kiruhura District and a technical center at Namanve- Mukono District were completed. The site clearance and grading for both facilities was ongoing by February 2021 awaiting handover to the contractor.

The MoSTI through the Presidential Scientific Initiative on Epidemics (PRESIDE) funded 23 research projects aimed at developing tools, therapeutics and vaccines to combat the COVID-19 pandemic. The projects were at varying levels of progress with one project on therapeutics at human trials, one on tools for diagnosing COVID-19 at animal trials while most of the projects were still at preliminary stages due to procurement delays of essential equipment and a few failures. The MoSTI also supported 14 innovations with a goal to commercialization, however out of the seven monitored projects only four (4) were producing for the market while the other projects were far from achieving the fund goal.

The construction of Kiira Vehicle Assembly Plant start-up facilities (assembly shop and warehouse) under the Kiira Motors Corporation (KMC) was at 68% progress. The construction of the circulation roads (3.4km) remained at 50% progress due expiration of the contract for the supervising consultant. The KMC developed a statement of requirements for both electric and diesel buses. By February 2021 one diesel bus was built in partnership with Luweero Industries and was undergoing road tests. The KMC made a 30% (1.708bn) payment for 1,280 acres of land in Kayunga District for establishment of an Automotive Industrial Technology Park. The stakeholder consultations on the development of an automotive industry policy were completed and draft regulatory impact assessment updated.

The Banana Industrial Research and Development Centre (BIRDC) during the period under review acquired a quality (Q) distinctive mark for the two products; raw and instant *Tooke* flours. This was anticipated to improve product marketing within and outside the country. The BIRDC procured a pilot drum dryer and studies on the development of *Tooke* flakes and *Tooke* flour composite were ongoing to increase on the products range. The BIRDC was in the process of acquiring ISO 22000:2018 certification (food safety management systems). The commercialisation of research laboratories was awaiting accreditation by UNBS. The pilot plant was not operating on commercial scale due to lack of working capital and low operating capacity of the tunnel dryer and storage facilities. The BIRDC did not have a substantive Board of Directors.

The Sericulture Technologies and Innovations Project maintained an aggregate total of 624.92 acres of mulberry in the following districts; Mukono, Sheema, Mubende, Kayunga, Kamuli, Iganga, Tororo, Palisa, Bulambuli, Bukedea, Zombo and Nwoya. Civil works for cocoon storage and processing facilities at Sheema and Mukono stations was at 90% physical progress. The procurement of post cocoon processing equipment was ongoing and delivery was anticipated in Q4 of FY 2020/21. The project provided agronomic and cooperative training to 120 farmers. The project received a 140% budget enhancement, however this did not cause a change in the targets and outputs for the FY2020/21. It was observed that the project had not been approved by the MFPED Development Committee and does not have clearly spelt out annualized deliverables



for the project duration. The subvention did not have legally binding agreements for the land where infrastructure developments were being established.

Under **Science Entrepreneurship Programme**, two regional Multimedia public engagements and meetings with local leaders in Northern and Western Regions were conducted. The engagements reached over 20,000 students using *YIYA* Air Science home based learning in partnership with *YIYA* Engineering solutions through radio and mobile phones. The National STI Advancement Task force was constituted and the draft terms of reference (ToRs) developed.

**The Industrial Research Programme;** Under UIRI, production of hydrolytic enzymes for bio-polishing of denim jeans was continued at laboratory scale. The food division developed spiced ghee and probiotic cheese. In partnership with Fraunhofer Gesellschaft Institute, the UIRI continued to improve on the performance of the Electronically Controlled Gravity Feed (ECGF) system in preparation for commercialisation. The UIRI equipped the textiles laboratory and expanded the tailoring section at the Manufacturing, Machining and Industrial Skilling Centre (MMISC). During the period under review 935,000 reusable non-medical face masks were produced and 106 Ugandans were trained in textiles technologies. The UIRI recruited eight staff and procured and installed a 1,250 kva generator and fuel reservoir tank (10,000 litres) for the MMISC. Stone pitching of the drainage at MMISC was completed.

## Conclusion

The STI sector performance was fair (61.6%) with most research outputs yet to be commercialised. Commercialisation of most research prototypes under the innovation grants (National Research and Innovations Projects -NRIPF) was yet to be realised. The overall programme performance was fair at 59.6%. The KMC posted better performance in comparison to the other sub-programmes. Commercialisation of the banana primary processing pilot plant and research laboratories were yet to be achieved by BIRDC. Four out of the seven monitored NRIP beneficiaries had started commercialisation, while the rest were far from achieving the objective of the call of supporting commercialisation of innovations.

Some projects were still reporting outputs achieved in the first grant provided under UNCST. The performance of the Presidential Scientific Initiative on Epidemics (PRESIDE) projects could not be assessed due to lack of targets for the projects and most of the research outputs were at procurement stage. The Sericulture Project is being implemented without approval from the Development Committee. The land on which non movable assets are made is acquired through Memoranda of Understanding with relevant authorities/owners which is a threat to public investments. Moreover, the expenditures on the processes of securing the MoUs for acquisition of land were hardly justifiable. The fair performance of the sector is due to; poor prioritization of key STI interventions, inadequate budget releases, delayed implementation of projects, infrastructure gaps to commercialise STI innovations, outbreak of COVID-19 and governance gaps among others.



## Recommendations

1. The programme should prioritise funding for development activities across all agencies.
2. The MoSTI should urgently constitute the governing boards for KMC and BIRDC.
3. The MoSTI should enhance the capacity of UNCST and streamline implementation of the NSTEI-SEP to avoid delays and cost overruns.
4. There is need for MoSTI to establish the science and technology parks to house incubates who graduate from micro and small incubation centers.
5. The MoSTI should lead the process of the sericulture project becoming a public investment project with clear objectives, activities, outputs, outcomes and timeframe.
6. The MoSTI should provide technical support to NRIP beneficiaries to commercialise the innovations and ensure value for the disbursed funds. Future selection should focus on projects whose prototypes have been proven.
7. The MFPED should undertake an audit of the NRIP fund and sericulture subvention to ensure value for money.





# 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 Sector 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/Innovation, technology development and transfer programme aims to increase the application of appropriate technology in the production and service delivery processes through the development of a well-coordinated STI eco-system and is guided by five strategic objectives as provided in the third National Development Plan (NDPIII):

- To develop requisite STI infrastructure;
- To build human resource capacity in STI;
- To strengthen R&D capacities and applications;
- To increase development, transfer and adoption of appropriate technologies and innovations;
- To improve the legal and regulatory framework.



## CHAPTER 2: METHODOLOGY

### 2.1 Scope

This chapter reviews progress of programmes and projects implemented by the sector agencies in FY2020/21 for the period 1<sup>st</sup> July to 31<sup>st</sup> December 2020.

**Table2.1: Scope of Semi-Annual Monitoring for FY2020/21**

Vote	Programme/Sub-programme
Vote 023, Ministry of Science, Technology and Innovations (MoSTI)	Regulation Research and Innovation Programme <ul style="list-style-type: none"> <li>• Kiira Motors Corporation (KMC),</li> <li>• Uganda National Council for Science and Technology (UNCST)</li> <li>• Banana Industrial Research and Development Centre (BIRDC)</li> <li>• Presidential scientific initiative on epidemics</li> </ul> Science entrepreneurship
Vote110 Uganda Industrial Research Institute (IIRI)	Industrial Research Programme

*Source: Author's Compilation*

### 2.2 Methodology

Physical performance of projects and outputs was assessed through monitoring arrange 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: MinisterialPolicyStatementsforFY2020/21; 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 makeup 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 FY 2020/21**

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:

1. Lack of detailed quarterly work plans and targets for some programmes/projects/outputs.
2. Lack of disaggregated financial information for some outputs which might have affected the overall weighted scores and performance.
3. Inadequate sampling of beneficiaries due to limited field time.
4. Some of the beneficiaries had little information on scope of works, project costs, contract periods particularly on projects contracted and implemented by some Votes.
5. Insufficient financial information at output level from the votes might have affected the performance rating of the sector.
6. 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 61.6%. Recurrent programmes performed better than development programmes.

#### Financial performance

The STI sector budget for FY2020/21 is Ug shs 277.195bn of which Ug shs 119.980bn (43.3%) was released and Ug shs 95.439bn (79.5%) expended by 31<sup>st</sup> December, 2020. The overall sector release and expenditure performance was poor and good respectively. Table 3.1 shows the overall sector financial performance.

**Table 3.1: Overall Financial Performance of the STI Sector by 31<sup>st</sup> December, 2020**

Institution	Budget	Release	Expenditure	% Release	% Spent
MoSTI	252,692,000,000	109,856,715,461	86,764,139,999	43.5	79
UIRI	24,503,310,465	10,123,428,393	8,675,651,899	41.3	85.7
TOTAL	277,195,310,465	119,980,143,854	95,439,791,898	43.3	79.5

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) 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 FY2020/21 are: policies and regulations for physical, chemical, social sciences, biosciences, and bio-economy developed and monitored; partnerships and networks in bio-sciences, social, physical and chemical sciences developed and strengthened; 2<sup>nd</sup> National annual bio-safety conference organised, climate change initiatives supported and



National chemical society strengthened among others.

### **Performance of the Regulation Programme**

The programme budget for FY2020/21 is Ug shs 4.3bn, of which Ug shs 1.34bn (31.2%) was released and Ug shs 0.82bn (61.2%) spent by 31<sup>st</sup> December, 2020.

Under the Bio-Safety and Bio-Security Sub-Programme, consultative meetings on development of Biotechnology and Bio-safety Communication Strategy were held in LGs of Mbale, Manafa, Sironko Hoima, Kagadi, Kibaale, Zombo, Nebbi, Arua. Mbarara, Bushenyi, Kabaale, Kyegegwa, Kasese, Fort portal, Masaka, Kyotera, Jinja, Kamuli, Tororo, Soroti, Katakwi, Moroto, Gulu, Lira and Amuru.

Consultative meetings on waste valorisation and management were conducted in LGs in Eastern region. Stakeholder trainings in bio-waste utilisation were conducted in the following National Parks: Queen Elizabeth NP, Semiliki Valley NP, Rwenzori NP, Lake Mburo NP, Kibale Forest NP, Mgahinga Gorilla NP and Bwindi Impenetrable NP.

The programme participated in the EASTECO Science, Technology and Innovation Virtual Conference and made a poster presentation on Bio-economy Contributions to Uganda's Economic Growth and Policy Implications. The following stakeholders in Bio-fortification were engaged: Senai Bioscience Laboratories, National Crops Resources Research Institute, Makerere University Agricultural Research Institute Kabanyolo, Mukono Zonal Agricultural Research and Development Institute, Community Enterprises Development Organization (CEDO), Mountains of the Moon University, Serere ZARDI, Hoima Caritas Development Organization, Ngetta ZARDI and Abi ZARDI.

Stakeholder consultations with academia, national and game parks and Central Forest Reserves management on bio-economy resources were conducted and the 2<sup>nd</sup> Bio-economy Policy draft was finalised. Bio-economy resources and products in selected districts of eastern region, National parks, game parks and forest reserves were catalogued. Two project concepts were developed and submitted to the Global Climate Fund.

In a bid to promote gender and equity in ST&I the sub-programme for physical, chemical and social sciences initiated engagements with the following institutions that work directly with people of special needs; the Albinism Umbrella, Equal Opportunities Commission, and National Council for Disabilities, National Union of Disabled Persons in Uganda and Legal Action for Persons with Disabilities. Regional assessments on social safety safe guards in STI projects and of new and emerging technologies were conducted in central region in the following Universities; Makerere, Ndejje, Kampala International University and Uganda Christian University. Consultations on chemical process regulation were conducted with private sector (Hima cement, Kilembe Mines Company) and various MDAs. Consultative engagements on the development of the RIA for the Indigenous Knowledge Policy were conducted with private sector, MDAs, Academia and cultural institutions.



The collaborations in Space Science and Technology (SST) were initiated and a Cooperative Research Agreement (CRA) with Kyutech Japan/BIRDS5 Project was signed, South Africa\_ Uganda SST Collaboration Programme Framework was Signed, Draft South Africa ± Uganda SST Collaboration Agreement initiated, and the Draft Uganda-Egypt-Kenya and Airbus-UNOOSA Regional Project collaboration Agreement was initiated. Consultative meetings with SST National Stakeholders applications and end-users (OPM, MAAIF, NARO, MoWE, NEMA, NFA, MoICT&NG, UCC, UBC, NITA-U, UTL, MoLHUD, RCMRD, MoDVA, UPDF, UPF) were conducted. Training of three (3) Ugandan engineers in Japan in space technology supported

The materials laboratories were profiled in the following institutions; Makerere University, Kyambogo University, UNBS, Ministry of Works and Transport, Kampala International University and Busitema University. Draft Cabinet Paper on the National Space Program and Satellite Ground Infrastructure in Uganda submitted and draft framework and roadmap prepared. Table 3.2 shows the performance of the regulation programme.

**Table 3.2: Performance of the Regulation Programme by 31<sup>st</sup> December, 2020**

Sub-programmes	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
Bio safety and Bio security	Enabling policies, laws and regulations developed	1,187,341,000	428,968,868	9.00	0.40	3.40	Consultative meetings on development of Biotechnology and Bio safety communication strategy were held in Eastern, Western and Northern regions of Uganda.
Bio-sciences and bio economy	Enabling policies, laws and regulations developed	1,193,800,000	462,306,216	7.00	2.50	25.61	Second draft of the bio-economy policy was finalized. Consultative meetings on waste valorisation and management were conducted in DLGs in Eastern Uganda. Stakeholder trainings in bio-waste utilization were conducted for selected National parks management. Two research concepts for funding were submitted to the Global Climate Fund.



Sub-programmes	Output	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
Physical chemical and social sciences	Enabling policies, laws and regulations developed	1,333,502,288	600,682,299	11.00	4.20	26.30	Engagements with institutions that work directly with people of special needs were initiated to promote G&E in ST&I. Regional assessments on social safety safe guards in STI projects and of new and emerging technologies were conducted in Universities in the central region. Collaborations in space science and technology (SST) were initiated with different organization. Materials laboratories were profiled for selected institutions. RIA for the Indigenous Knowledge Policy was conducted with stakeholders
	Standards and guidelines	583,820,000	183,000,000	2.00	0.60	13.00	Conducted engagements with the universities in eastern Uganda on strengthening the Uganda Chemical Society.
Programme Performance (Outputs)						55.31	Fair performance

Source: IFMS, Progress Reports and Field Findings

### Conclusion

The overall programme performance was fair (55.3%) as most planned activities were at inception stage. The poor budget releases (31.2%) and outbreak of the COVID-19 pandemic that limited staff movement, affected implementation of planned activities.



### 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 FY2020/21 are: Research and Development (R&D) supported and jointly undertaken, national research and development strategy developed, indigenous knowledge and research mapped and documented, needs assessment for human resource capacity in research and development undertaken; strategic partnerships to foster local and international technology transfer developed, draft technology development and transfer standards and guidelines developed, technology, innovations and engineering and emerging technology profile developed, national ST&I infrastructure development strategy developed, framework for establishment of ST&I parks developed research institutions supported in the development of institutional IP policy and innovators supported in IP registration. The programme has the following subventions involved in research and devolvement: presidential initiative on banana industrial development, Kiira motors corporation, presidential scientific initiative on epidemics (PRESIDE), NSTEI-SE and sericulture projects.

#### Performance of the Research and Innovation Programme

The programme budget for FY2020/21 is Ug shs 193.29bn, inclusive of the supplementary budget of Ug shs 31.032bn for the PRSIDE Project. Ug shs 60.14bn (31.1%) was released and Ug shs 57.27bn (95.23%) spent by 31<sup>st</sup> December, 2020. The release and expenditure were poor and very good respectively.

During the period under review, a concept note for the National Technology Development and Transfer Framework was developed, preliminary stakeholder engagements conducted and task force constituted. In collaboration with national and international partners, the programme reviewed Phase I of the SDG impact accelerator program and initiated phase II of the SDG accelerator program. In collaboration with the UN Tech Bank, a roadmap for the Tech Access partnership with respect to addressing the challenges brought on by the advent of COVID-19 was developed. Sweet Potato value chain development and technology transfer was developed in collaboration with CURAD and a consortium of researchers (NARO, MUK). Task force for development of National ST&I Infrastructure Development Strategy was constituted and ToRs drafted.

Comparative study for ST&I infrastructure in the Eastern and Western regions was undertaken. Draft ST&I Infrastructure Catalogue was reviewed and updated and a report on space usage relationships for various ST&I infrastructure compiled. A report on existing utilisation mechanisms of ST&I institutions in Central region was developed. Field assessments on the establishment of an alternative protein research and production centre at UMU Nkozi



and upgrading of ST&I facilities into a bio-pesticide research and development centre at NASARRI were undertaken. The programme profile 48 innovators and 20 were provided with technical support to intellectual property rights. Two research institutions were supported in the development of institutional intellectual policy. The programme carried out monitoring visits to the 14 projects supported under the NRIFP.

### **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 Innovation Centre (NSTEIC)*-Rwebitete, and *Technology Innovation and Business Incubation Centre (TIBIC)*-Namanve 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 and end in 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 FY2020/21 is Ug shs 145.757bn of which Ug shs 133.36bn in external funding and Ug shs 12.4bn as GoU financing contribution. Ug shs 7.392bn was released and all spent by 31<sup>st</sup> December, 2020. The project did not receive donor funding during the period under review.

During the period under review the environment social impact assessment; cadastral, topographic and hydrological surveys for both project sites: NSTEIC at Rwebitete and TIBIC at Namanve were completed. Site clearance and grading for both facilities was ongoing by February 2021 awaiting handover to the contractor. The project procured a consultancy firm; to develop management and operational framework and guidelines for the TIBIC & NSTEIC



and instructional curriculum. The project also procured a recruitment consultancy firm and project personnel recruitment was ongoing. Procurement of project vehicles and furniture was scheduled for Q3 and Q4. The project constituted inter-ministerial and project steering committees but they were yet to be appointed. Project sites handover to the contractor was anticipated in Q4.

It was observed that planned activities were implemented at a rather slower pace which is likely to affect the project timelines.



L-R: Grades sites at NSTEIC-Rwebitete and TIBIC-Namanve

### 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 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.

The approved budget for FY2020/21 for Kiira Motor's Corporation is Ug shs 42.125bn of which Ug shs 27.469bn (65.2% of the approved budget) was released and all spent by 31<sup>st</sup> December, 2020.

#### Physical performance

Construction of the Kiira Vehicle Plant start-up facilities (assembly shop and warehouse) under the Kiira Motors Corporation (KMC) was at 68% progress. Construction of circulation roads (3.4km) had stayed at 50% progress due expiration of the contract for the supervising consultant. The KMC developed a statement of requirements for both electric and diesel buses. By February 2021 one diesel bus was built in partnership with Luwero Industries and was undergoing road tests. The KMC made a 30% (Ug shs 1.708bn) payment for 1,280 acres of land



in Kayunga District for establishment of an automotive industrial technology park. Stakeholder consultations on the development of an automotive industry policy were completed and draft regulatory impact assessment updated.

Construction of the Kiira Vehicle Assembly Shop, plant start-up facilities -Phase I and plant offices was ongoing and at 68% progress. The following were achieved during the period under review: 100% block walling, internal plastering of the assembly and electrical and plumbing ducts; 90% roofing done. The contract for design of body shop, paint shop, electrophoresis shop and chassis line was signed.

The construction of the Kiira Vehicle Plant Warehouse was substantially complete with following achievements as off 31<sup>st</sup> December, 2020: 100% internal and external plastering done, electrical and plumbing ducts done, 100% first line installation for electrical, mechanical, and ICT works. The foundation for the pump house and water reservoir was completed and 50% starter column for the perimeter fence done. Design specifications for the assembly plant (Chassis line, electrophoresis shop, body shop and paint shop) were completed.

The contract for construction of the 2.79km dual carriage principal and classified road by KOM Consults was extended for six months with little progress observed.

The KMC planned to build two Kayoola EVS and two Kayoola diesel coaches and one mobile charging unit. By February 2021 one Kayoola diesel bus was built in collaboration with Luweero industries and was undergoing road tests. The KMC developed and submitted to the Solicitor General the statement of requirements for the electrical and diesel bus technology transfer program between KMC and CHTC Automobile Co., Ltd.

The KMC procured 2 square miles of land in Kayunga district for establishment of an Automotive Industrial and Technology Park to support investment in motor vehicle parts manufacture. The corporation made 30% down payment (Ug shs 1.708bn) and cadastral and topographical surveys were ongoing. The KMC developed ToRs for consultancy services for the preparation of the strategic investment plan of the Automotive Industrial and Technology Park. Stakeholder consultations were finalised and findings used to update the draft Automotive Industry Policy. The KMC drafted a cabinet paper on building of an indigenous motor vehicle industry in Uganda. Improvement of the Bulamu ventilator prototype was ongoing and the following modifications were incorporated; printed circuit board, pneumatic air supply and artificial intelligence power unit. A Cabinet Paper for approval of the members of the KMC Board of Directors was submitted to the Cabinet secretariat and MFPED for a certificate of financial implication.

The overall project performance was good, but behind schedule due to inadequate releases (53% of approved four-year budget). It is therefore paramount that the KMC and MoSTI enhance stakeholder engagement to appreciate the roadmap and the associated timelines for the commercialization of the Kiira Electric Vehicle Project and vehicle assembling plants.



**L-R: KMC vehicle assembly shop under construction at JIBP and a diesel bus built by KMC**

### **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.

The project is in tandem with the Government's priority economic strategies in the third National Development Plan (NDP III), strategic objectives one and two: enhance value addition in key growth opportunities and strengthen the private sector capacity to drive growth and create jobs.

The planned outputs for FY2020/21, operationalise the BIRDC model, recruit the staff, commercialize the banana pilot plant and research laboratories, continuous product development, establish a secure IP portfolio, Global supply chain development and operationalization, Continuous local and international market development, optimise the banana value chain benefits to rural farmers.

#### **Performance of the BIRDC**

The approved budget for, FY2020/21 is Ug shs 11.5bn, of which Ug shs 5.75bn (50% of the approved budget) was released and Ug shs 5.38bn (93.6% of the released funds) spent by 31<sup>st</sup> December, 2020. The BIRDC received Ug shs 244 million for COVID-19 research and development; however, by 31<sup>st</sup> December no expenditure was made. A total of Ug shs 126 million was collected as non-tax revenue and Ug shs 113 million spent at source by 31<sup>st</sup> December, 2020.



The Banana Industrial Research and Development Centre (BIRDC) was registered as a company in FY2019/20 in fulfillment of the strategy for operationalisation of the Presidential Initiative on Banana Industrial Development. However, operationalisation of the BIRDC model was yet to be achieved due to lack of a certificate of financial implication and a governance framework. The pilot plant acquired quality distinctive mark for two products; raw and instant *Tooke* flour and initiatives to have the products certified for ISO: 22000 (Food Safety Management Systems) were underway. The BIRDC filed five patent applications and several research studies were ongoing and these included; pilot plant efficiency, product development using different banana formulations for bakery products, development of banana flakes using a drum dryer and on-farm banana production systems. During the period under review 401,699.8kg of bananas were procured for production of raw and instant *Tooke* flours against annual target of 960,000kg.

It was observed that the pilot plant was not running on a commercial scale and therefore yet to deliver on the objective of science led processing and value addition for improved livelihood of banana farmers in the region. The BIRDC had challenges of inadequate staff and did not have a substantive Board of Directors.

#### **3.2.2.4 Sericulture Project**

Located in Sheema and Mukono districts, the project aims at increasing production of silk, promotion of sericulture technologies in Uganda and undertaking research and development in silk production value chain. 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.

The Sericulture Project deliverables for FY2020/21 are: construct and equip two research and technology transfer centres, acquire 75 acres of land for sericulture development, construct 8 valley water tanks/dams, silk worms reared at four stations, procure and install four complete lines of post cocoon processing equipment, validate nine sericulture appropriate technologies, maintain 1200 acres of mulberry, construct four post cocoon handling, storage and drying houses, conduct crop demonstrations, training and capacity building and project monitoring and administration

During the period under review, the project received Ug shs12.5bn against the original budget of Ug shs 5.180bn and Ug shs 9.883bn was spent by 31<sup>st</sup> December, 2020 representing 79.1% absorption. Over Ug shs 800 million was spent on allowances for local government leaders engaged in land acquisition processes.

By February 2021, construction of the silk worm rearing houses at Rubaare and Namasumbi stations were at final finishes. The physical progress at both sites was estimated to be 85% and 80% respectively. Procurement of a complete line of next generation equipment for post cocoon technologies and innovations was ongoing and delivery is expected in Q4 of FY2020/21.

A total of 488 acres of mulberry were established in 12 districts of Sheema, Bulambuli, Kamuli,



Mukono, Iganga, Bukedea, Zombo, Pallisa, Busia, Kayunga, Nwoya and Mubende bringing the total acreage under mulberry to 624 acres. During the period under review, silk worm rearing had started at three satellite stations of Kayunga, Kamuli and Pallisa. The planted mulberry at Busitema had reached harvest stage but silk worm rearing was yet to begin. A total of 265 acres of land were acquired in eight districts for mulberry growing through signing memoranda of understanding with district local governments and individual owners.

The Namasumbi Sericulture Station was evaluating four mulberry varieties (Thailand, Thika, Embu and Local) for silk worm rearing and four models of egg production from China, India, ICIPE and KALRO.



**L-R: Structure to house post-cocoon silk equipment at Namasumbi Station, Mukono District and worm rearing structure under construction at Nwoya Sericulture Satellite Station**

It was observed that the 140% budget enhancement was not commensurate with the change in quantity of outputs. The benefits of commercialisation of sericulture notwithstanding, the current investment is not in tandem with the public investment guidelines for preparation and appraisal of projects 2017.

### **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 in FY2019/20. The framework replaced 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. A total of 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 Scientific Initiative on Epidemics to procure equipment and reagents for COVID-19 research. The funds were disbursed in the last quarter of the FY2019/20 and implementation generally started in Q1 FY2020/21 and implementation was at varying levels of progress.

Seven out of the 14 supported projects were sampled for monitoring and they include: Integrated Banana Juice Factory in Uganda Project (*Eshande*) Juice; Commercialisation of local Banana Juice (*Eshande*) Production to answer Industrial Raw Material Demand; Low



Cost Solar Irrigation Water Pumps; Production of tropical fruit wines for improved rural household incomes and reduced post-harvest losses of fruits; Up-Scaling the production and distribution of Bugalama Super Banana Wine; Production of Nutrient Dense Composite Flours for complementary feeding solutions to fight infant malnutrition in Uganda and Improving livelihoods of rural communities through cassava processing and value addition.

The status of implementation of the projects is shown in table 3.3.



Table 3.3: Performance of NRIP Supported Projects

Project title	UNCST Grant FY 2017/18 (million)	MoSTI Grant FY 2019/20	Planned outputs	Progress and challenges	Remark
Integrated Banana Juice Factory in Uganda Project (Eshande) Juice. Buloba-Wakiso District	675.08	250,000,000	Architectural banana juice factory design developed -one market study conducted -ripening room designs developed	Architectural designs of the juice factory were developed. -A market study to inform the acceptability and product consumers -Design of a banana ripening was delayed by closure of academic institutions due to covid-19 outbreak	The project outputs (Eshande) are far from commercialisation as intended by the grant
Commercialization of local Banana Juice (Eshande) Production to answer Industrial Raw Material Demand Bushenyi District	338.77	600,000,000	-Procure finished goods delivery truck, juice haulage truck -Acquire UNBS certification of the products -borehole abstraction -Commercialise production	-Procured 4.5MT truck for finished product delivery -Acquired UNBS Q mark for three products (honey, banana juice ready to drink and banana juice dilute to taste) -Borehole abstraction was completed in 2019 -Procurement and delivery of three delivery tanks was yet to be completed due to inadequate budget -Juice production increased from 6 m <sup>3</sup> to 20m <sup>3</sup> per week. The project noted challenges of juice spoilage due to lack of a refrigerated raw juice transportation truck.	The project showed efficiency in resource utilization and had achieved the grant objective of supporting innovations for commercialisation.
Low Cost Solar Irrigation Water Pumps Makerere University – College of Engineering	520.0	300,000,000	-Manufacture and brand 200 pumps -Setup pilot irrigation sites in all regions of the country -Train 200 farmers -Setup a pump factory	-Seven on-farm demonstration sites were setup in the following districts Wakiso, Gulu, Pallisa, Kiryandongo, Soroti, Lira and Kasese. -89 farmers were trained and 50 provided with solar pumps as part of trail runs.	The project was far from achieving the intended objective of commercialisation and it was still reporting on outputs achieved in the first grant.
Production of tropical fruit wines for improved rural household incomes and reduced post-harvest losses of fruits Mukono	162.1	250,000,000	-Acquire UNBS quality certification mark -Construction of robust wine processing plant -Procurement and installation of robust	The following were procured; delivery van (2MT) and pineapple juice press (200 pcs/hr) Sub-structure of the wine factory was constructed The Maritas Foods Ltd was in a process of acquiring the UNBS Q mark Product quality improvement was ongoing.	The project demonstrated potential for commercialisation however product certification was not



Project title	UNCST Grant FY 2017/18 (million)	MoSTI Grant FY 2019/20	Planned outputs	Progress and challenges	Remark
			<p>machine</p> <ul style="list-style-type: none"> <li>-Procurement of a delivery van for finished products</li> <li>-continuous product quality improvement</li> <li>-Training of farming communities in basic wine making</li> </ul>	<p>The project had challenges of inadequate fund to complete the planned outputs</p>	<p>achieved.</p>
Up-Scaling the Production and Distribution of Bugalama Super Banana Wine Kigarama- Shema	64.77	200,000,000	<p>Procure production consumables and other key assets.</p> <p>Continuous product improvement</p>	<ul style="list-style-type: none"> <li>-The project procured a generator, tricycle, and office equipment and production consumables.</li> <li>-The project experienced reduction in sales amidst increase in production volumes attributed to COVID-19 restrictions on bars and weddings.</li> </ul>	<p>The project demonstrated both efficiency and effectiveness in delivering outputs</p>
Production of Nutrient Dense Composite Flours for complementary feeding solutions to fight infant malnutrition in Uganda Sseeta- Mukono	85.75	200,000,000	<ul style="list-style-type: none"> <li>-Purchase of processing machinery</li> <li>-Start commercial production of the product</li> </ul>	<p>UNBS quality mark acquired for the two products; pumpkin millet probiotic and moringa millet probiotic blended flours</p> <p>Filled patent application for the two products with URSB</p> <p>Commercial production had not commenced and the project had challenges sourcing for quality raw materials and lack of developed channels for marketing the product</p>	<p>Commercialization of the products was yet to start and was still reporting on outputs achieved from the first grant. There is need for the project to develop a marketing strategy for the products.</p>
Improving Livelihoods of Rural Communities through Cassava Processing and Value Addition Lira Industrial Area	82.95	560,000,000	<ul style="list-style-type: none"> <li>Acquire UNBS quality mark for HQCF</li> <li>-Construction of peeling shade</li> <li>-Modification of peeling machine</li> </ul>	<p>Constructed, peeling shade, washing station and a perimeter fence around the factory</p> <p>Modification of peeling machine and chipping machine from 500 to 2000kg/h was ongoing. The company was engaging Hot Loaf Bakery Ltd in production of cassava flour blended products like bread, cakes, cookies and chapattis by complementing wheat flour with cassava flour.</p> <p>The project PI lost his life in a motor accident in February 2021.</p>	<p>Project registered good progress and had achieved the intended objective of commercialisation of the cassava flour.</p>

Source: UNCST, MoSTI & Field findings



### 3.2.2.6 Presidential Scientific Initiative on Epidemics

In FY2020/21, the scientists working under the Presidential Scientific Initiative on Epidemics (PRESIDE) were allocated Ug shs 31.03bn towards research and development for COVID-19 response tools. By 31<sup>st</sup> December 2020, Ug shs 25.87bn had been released to MoSTI, of which Ug shs 15.787bn is for equipment for COVID-19 research and development, and Ug shs 10.084bn for recurrent expenses for the 23 research projects. All funds were managed by the MoSTI.

The procurement of equipment under PRESIDE is executed by MoSTI and the status of the process is shown in table 3.5. Implementation was generally at inception level as most of the equipment were still under procurement as shown in table 3.4 and 3.5.

**Table 3.4: Progress of the PRESIDE Projects by 31<sup>st</sup>December 2020**

Project	Progress	Allocation FY2020/21 (Ugsh)
The PCR and anti-body diagnostic kits	Prototype of COVID-19 antibody test kit developed and commercial production anticipated in Q4 Construction of good manufacturing practice facility and procurement of equipment was ongoing	1,476,200,000
PCR based Diagnostic assays	The assay is ready with proof of concept and ethical clearance by UNCST approved. The assay is expected to reduce the cost and run time of PCR test to USD 8 and 20-30 minutes respectively. However, procurement of some major equipment was yet to be concluded.	308,795,000
Saliva Diagnostic Kit	Procurement of R&D equipment ongoing	159,954,000
NANO-Adjuvant Therapeutics, Vaccine adjuvant & materials testing	Procurement of R&D equipment ongoing	111,401,650
Development of Antibody ELISA for COVID-19 Surveillance	No progress so far as the project is awaiting products from Oligopeptide synthesis process.	201,300,000
COVID-19 Subunit Vaccine	Vaccine development process and procurement of laboratory reagents/consumables were ongoing. Animal trials expected to begin in Q3 FY2020/21.	754,295,950
Inactivated COVID-19 Vaccine development	Vaccine development process and procurement of laboratory reagents/consumables were ongoing. Animal trials expected to begin in Q3 FY2020/21.	1,337,392,224
Self-Amplifying RNA	No progress made after withdrawal of the project partner from UK	344,513,743
Novel Adenovector COVID-19 Vaccine	At preliminary stages	493,029,000
Hyper Immune Immunoglobulin	Prototype of the therapeutic drug developed and awaiting clearance from UNCST to start a clinical trial	373,223,400
The Production and Clinical Evaluation of Herbal Medicinal Drugs for effective Management of COVID-19 and other Diseases in Preparation for Future Epidemics in Uganda	A natural therapy from honey bees was developed and clinical trials were ongoing under the National Chemotherapeutic Institute.	1,260,000,000
Stem Cell Research	No progress, project under technical review.	171,487,123



Project	Progress	Allocation FY2020/21 (Ugsh)
Therapeutic Intervention for COVID-19 using Antivirals, Immune modulators and antiplatelet agents	No progress reported	200,000,000
Identification and optimization of available drug molecules for clinical treatment of COVID-19	Ivermectin was identified and cleared by NDA as a candidate drug for treatment of COVID-19. The project is yet to start clinical trials after ethical clearance by UNCST.	202,065,000
Assessment of Vit D plasma levels in high-risk groups (Diabetics, Hypertensives, Cancer, COPD, HIV, Health workers)	Data collection and sample analysis for Vit D in COVID-19 high-risk groups was ongoing.	360,000,000
Matooke Starch as a Pharmaceutical Excipient in Selected Medicinal Formulations for use in the treatment of COVID-19	No progress reported	243,901,000
Evaluation of the anti-SARS-COV-2 activity of Tephrosialinearis, Zanthoxylum chalybeum and Albizia coriaria and formulation of a herbal product for management of COVID-19	Little progress so far made, completed preliminary experiments. The project was delayed by procurement and institutional related challenges	160,000,000
Lab Animal house	Procurement of a contractor to renovate facility at Makerere University was ongoing.	1,401,066,270
Equipment for biomarker research facility	Procurement of key equipment was ongoing	80,074,900
Establishment of a high-quality biobank of samples from COVID-19 patients to facilitate research in diagnostics, treatment and vaccines	Bio-bank facility has been established at Makerere University	445,570,000
Support towards procurement of the vaccine/test kits manufacturing facility	Procurement of equipment was ongoing under MoSTI	
Equipment for testing facemasks and other personal protective wear	Procurement of equipment was ongoing under MoSTI	
Total		10,084,269,260

Source: MoSTI



**Table 3.5: Status of COVID-19 Research and Development Equipment Procurements under MoSTI as of 28<sup>th</sup> February 2021**

Contractor	Type of equipment	Contract sign date	Expected date of delivery	Contract amount (Ugsh)
Beautiful Engineering & Equipment LTD	Electron Scanning Microscope	23/11/2020	22/02/2021	2,450,500,000
Medfield Solutions (U) LTD	Assorted equipment from Eppendorf and Qiagen	30/11/2020	28/02/2021	3,508,836,990
Micro Heam Scientifics	Assorted equipment from Thermofisher and Biorad	30/11/2020	28/02/2021	2,646,260,440
Vision Scientific and Engineering Uganda	Assorted equipment from Thermofisher and VWR	30/11/2020	28/02/2021	832,375,493
Africa Biosystems Uganda	Assorted equipment from Thermofisher	30/11/2020	28/02/2021	647,083,564
Palin Corporation LTD	Assorted equipment from Mettler Toledo	20/01/2021	28/02/2021	633,021,396
ESTEC (Kenya)	Equipment from Hahanshin and Shimazdu	05/02/2021	05/05/2021	956,295,824
Kentros Limited (Kenya)	Assorted equipment from Brooks Automation	05/02/2021	05/05/2021	145,109,175
Kobian Scientific Uganda LTD.	Assorted equipment from Erweka and Merck	05/02/2021	05/05/2021	781,080,000
Science Logistics LTD	Assorted equipment from Thomas Scientific and Gilson	05/02/2021	05/05/2021	639,400,565
Medfield Solutions (U) LTD	Assorted equipment from Eppendorf and Molecular	05/03/2021	05/06/2021	1,262,065,593
Total				14,502,029,040

*Source: MoSTI*

The overall programme performance is shown in table 3.6.



**Table 3.6: Performance of the Research and Innovation Programme by 31<sup>st</sup> December 2020**

Sub-programmes	Outputs	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
Research and Development	Research and Development	16,506,202,831	10,536,374,913	11.00	2.40	8.07	Technical backstopping for 14 NRIP awardees was conducted. Most of the funds was a supplementary for the PRESIDE for covid-19 R&D.
Technology Development	Technology, Innovation transfer and development	1,400,478,392	402,339,911	5.00	1.80	2.00	Concept note for the National Technology development and transfer framework was developed, preliminary stakeholder engagements conducted and task force constituted.
Innovations registration and Intellectual Property Management	Technology, Innovation transfer and development	1,411,978,392	456,268,320	14.00	4.70	2.02	48 innovators were profiled and 20 were provided with technical support in IPR. 2 Institutions supported with the development of IP policy.
STI Infrastructure Development	Technology, Innovation transfer and development	1,339,478,392	414,384,603	8.00	3.60	1.92	Comparative study for ST&I infrastructure in the Eastern and Western regions was undertaken. Draft ST&I Infrastructure Catalogue was reviewed and updated and a report on space usage relationships for various ST&I infrastructure compiled.
Kiira Motors Corporation	Kiira vehicle assembly shop and plant office, ware house, plant utility system	19,253,422,984	19,253,422,984	100.00	68.00	18.74	68% of assembly building and warehouse civil works completed. Construction of the dual carriage principle road had stayed due to expiration of the contract for the contractor.
	Purchase of land (1280 acres and titled)	7,120,000,000	7,120,000,000	1.00	0.30	3.06	Contract for land procurement signed and cadastral and topographical survey commenced. 30% payment made.
	2 Electric and 2 diesel buses built	3,316,573,396	3,316,573,396	4.00	1.00	1.19	One diesel bus was built. Manufacture of production parts for the other buses was ongoing. Complimentary shuttle services offered to UCAA.
	Automotive industry advisor retained	191,958,000	191,958,000	12.00	6.00	0.14	Edward T. Hightower retained and rendered advice on KMC_CHTC technology transfer agreements. Draft stakeholder consultation report and RIA for the Automotive industry policy updated.



Sub-programmes	Outputs	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
	Bulamu medical ventilator	20,799,600	20,799,600	1.00	0.50	0.01	Improvements on power supply and artificial intelligence of the 4th generation Bulamu prototype were ongoing
National Science, Technology, Engineering and Innovation Skills Enhancement Project	Research and Development Transfer to innovators and scientists	2,000,000,000	1,000,000,000	100.00	1.00	0.06	Contract staff salaries paid
		12,400,000,000	7,392,357,300	25.00	13.80	16.43	Site clearance and grading for both facilities (TBIC & NSTEIC) was ongoing by February 2021 awaiting handover to the contractor. The project procured a consultancy firm; to develop management and operational framework and guidelines for the TBIC, NSTEIC and instructional curriculum. Procurement of project vehicles and furniture was scheduled for Q3 and Q4.
Presidential Initiative on Banana Industrial development	Operationalization of the BIRDC model	354,000,000	201,000,000	1.00	0.10	0.09	A task force to develop the institutional framework was constituted. Request for certificate of financial implication from MFPEd for BIRDC to operate as company.
	Commercialization of banana pilot plant and certification of the processing and laboratory framework	2,683,000,000	1,010,000,000	4.00	1.50	3.83	UNBS Quality certification for raw and instant Tooke flour was achieved. The PIBID trained staff in the pilot plant in food safety management systems. Accreditation of research laboratories and commercialization of the pilot plant were yet to be achieved.
	Global supply chain development and operationalization and continuous local product and market development	1,871,000,000	558,000,000	13.00	3.00	2.07	5 patent applications were filed. Development of a risk management register was ongoing. Draft sales policy was developed and product profile videos for online marketing were developed.



Sub-programmes	Outputs	Annual Budget (Ug shs)	Cum. Receipt (Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
Sericulture	Construction of grainage, rearing, reeling and re-reeling facilities	260,000,000	1,870,000,000	12.00	4.00	0.02	Civil works for grainage, rearing, reeling, re-reeling facilities at Rubare and Namasumbi stations was substantially complete and undergoing final finishes. The cost of constructing the structures increased beyond the acceptable threshold for variations. Two valley dams were reportedly constructed. However, this output had been delivered in the previous years. Construction of the shelling house was ongoing at Mukono and Nwoya stations.
	Sericulture equipment purchased and installed	370,000,000	1,100,000,000	4.00	2.00	0.09	Manufacture of post cocoon, reeling and re-reeling equipment was ongoing and delivery was expected in Q4
	Land acquired	300,000,000	1,000,000,000	75.00	265.00	0.43	265 acres of land acquired in the districts of Lira, Otuke, Amorator, Mubende, Kiruhura, Kween and Nwoya.
	Mulberry gardens established, research and capacity built	3,210,000,000	6,389,400,000	1893.00	1121.00	1.37	A cumulative total of 625 acres had been planted with mulberry. Research on three mulberry and silk worm varieties and production technologies was ongoing. Silk worm rearing started in three satellite stations (Kamuli, Kayunga and Palisa. A total of 120 farmers were trained in sericulture technologies.
	Programme Performance (Outputs)					59.63	Fair performance

Source: IFMS, MoSTI Progress Report, and field findings



## Conclusion

The overall programme performance was fair at 59.6%. The KMC posted better performance in comparison to the other sub-programmes. Four out of the seven monitored NRIP beneficiaries had started commercialisation while the rest were doing prototypes or designs for infrastructure and therefore far from achieving the objective of commercialisation of innovations.

It was observed that some projects were still reporting outputs achieved in the first grant provided under UNCST. The commercialisation of the banana primary processing pilot plant and research laboratories were yet to be achieved by BIRDC. The performance of the PRESIDE projects could not be assessed due to lack of targets. It was noted that most of the outputs facilitating the core research were at procurement stage.

The performance of the Sericulture Project did not reflect the 140% budget enhancement during the period under review. The pieces of land on which project investments are made is acquired through memoranda of understanding with relevant authorities/owners which is a threat to public investments. The expenditures on the processes of securing the MoUs for acquisition of land were hardly justifiable. Given the level of investments, the MoSTI should strengthen the relationship with Tropical Institute of Development Innovations (TRIDI) in terms of binding agreements to protect and safe guard public investments. The MoSTI should emphasize the alignment of activities/outputs of the beneficiaries to the project objectives and ensure value for money.

### 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 industrialization 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 FY2020/21 include: guidelines and standards for technological transfer and commercialization promotion developed, technology transfer initiatives supported, indigenous technology enterprises supported, access to new and existing technology by SME supported, feasibility studies on establishment of technology business incubation centres, ST&I skills development catalogue developed, human resources assessment in science and technology conducted, skilling at STI incubators supported, Uganda international science festival and exhibitions conducted and STI advancement strategy developed.



## Performance

The approved budget for the programme FY2020/21 is Ug shs 4.074bn, of which Ug shs 1.389 bn (34.1%) was released and Ug shs 0.896bn (64.5%) spent by 31<sup>st</sup> December, 2020. The release performance was poor, while expenditure was fair.

The programme conducted STI exhibitions in all the four regions of the country to showcase innovations to students and sector agencies. The ToRs for the consultant to develop ST&I advancement and public engagement strategy were developed. The follow-up visit on establishment of proposed technology business incubators and consultative meetings with municipality leaders in Eastern region were undertaken. The MoSTI carried out an assessment of commercialization of technology initiatives.

The programme conducted supervisory visits to assess performance of banana wine, urea, shea butter and essential oils innovators in Western, Northern and Eastern Uganda respectively, and participated in World science day commemoration festivities at Kyambogo University.

Table 3.7: Performance of the Science Entrepreneurship Programme by 31<sup>st</sup> December, 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	1,093,878,392	368,647,798	6.00	0.50	6.64	Supervisory visits to assess performance of innovations in Banana wine, urea, Shea butter, and essential oil production were conducted.
	Industrial Skills Development and capacity Building	361,600,000	68,375,000	1.00	0.20	8.87	Consultative meetings with municipality leaders in Eastern region on the development of Design for Technology Business Incubators were undertaken
Skills development	Industrial Skills Development and capacity Building	879,478,392	329,463,653	4.00	0.00	0.00	No outputs information provided
	Support Scientific and innovations	425,983,250	104,956,258	4.00	0.00	0.00	No outputs information provided
Advancement and Outreach	Industrial Skills Development and capacity Building	1,314,043,773	518,102,574	11.00	6.00	32.25	National science week and World science day festivities held. ST&I exhibitions were held in the four regions of the country. ToRs for ST&I advancement and public engagement strategy were developed.
	Programme Performance ( Outputs)					47.8	

Source: IFMS, MoSTI Progress Report, and field findings



## Conclusion

The programme output performance was poor at 47.8%. The programme objective of creating a critical mass of highly trained and skilled Science, Technology and Engineering (STE) professionals to drive industrialisation and economic growth is handy in realising Uganda Vision 2040. However, the programme experience poor budget release (34%) and most of the interventions were on creating awareness and sensitizations with a few on supporting training and skilling.

### 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 Industrialization 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 FY2020/21

The planned deliverables for UIRI include: undertake skills development for industrialists; design and develop hardware and analyze prototypes; purchase office equipment and specialized machinery; commercialize production of the neonatal baby warmer, ECGF machine, sanitary pads from local cotton and banana fibre, two hydrolytic enzymes, potato flour and non-medical face masks; support incubation activities at headquarters and satellite facilities and



operationalisation of the Machining Manufacturing Industrial and Skilling Centre (MMISC) in Namanve.

### 3.3.2 Performance of Industrial Research Programme

The approved budget for UIRI, FY2020/21 is Ug shs 24bn, of which Ug shs 10.123bn was released (41%) and Ug shs 8.675bn spent (85.7% of the released funds) by 31<sup>st</sup> December, 2020.

#### Project 1598: Retooling of Uganda Industrial Research Institute

The UIRI equipped the textiles laboratory and expanded the tailoring section at the Manufacturing, Machining and Industrial Skilling Centre (MMISC). The following textile quality testing equipment were procured and installed at MMISC textile laboratory; bacterial filtration efficiency tester, differential pressure tester and breathability tester. Processing equipment at the following value addition centres were repaired and maintained; Bwebajja textiles facility, Maziba wine factory and Koboko cosmetic factory. The UIRI procured and installed a 1250 kva generator, fuel reservoir tank (10,000l) at MMISC and assorted office and ICT equipment. Stone pitching of the drainage channel at MMISC was completed.



**L-R: Equipment installed in textiles quality testing laboratory and students from UPIK undergoing training in one of the mechatronics workshop at MMISC - Namanve**

### Headquarters

Preliminary works for the commercialisation of the ECGF machine were conducted with the help of a grant from the Fraunhofer Institute. The project team had modified the ECGF machine by adding a new microcontroller and currently migrating the legacy algorithms to the new platform. The commercial production of the neonatal warmer was yet to be achieved as improvements on the device were still going on. The commercialization of other research outputs including; sanitary pads from cotton and banana fibre and potato flour had not started.

The textiles division at MMISC-Namanve produced 935,000 re-usable non-medical face masks and trained 106 Ugandans in textiles technologies. A total of 370 food and non-food product samples were tested by the analytical laboratories. The UIRI provided technical support to entrepreneurs in value addition to fruits (tomato sauce, paste and hot pepper), dairy (pasteurized



milk, yoghurt and cheese) and banana. The UIRI in partnership with the Norwegian Refugee Council (NRC) trained 15 members of the United South Sudanese Urban Refugees Community (USSURC) in the production of laundry and cosmetics products. A total of eight (08) staff were recruited at UIRI headquarters during the period under review.

The inadequate recurrent budget release and the outbreak of COVID-19 and the SOPs issued by Ministry of Health that require social distancing affected the achievement of some of the recurrent outputs like SME training and support to incubates. Table 3.6 shows the performance of the Industrial Research Programme by 31<sup>st</sup> December, 2020.

**Table 3.8: Performance of the Industrial Research Programme by 31<sup>st</sup> December, 2020**

Sub-programmes	Output	Annual Budget ( Ug shs)	Cum. Receipt ( Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
Headquarters	Research and development	2,698,324,697	210,156,255	13.00	4.50	24.47	Improvement of the ECGF machine was ongoing to have it ready for commercialization. Research on development of herbal products for treatment of wounds was completed and other research studies were ongoing. The textiles unit at Namanve produced 935,000 reusable non-medical face masks and 370 product samples tested in analytical laboratories. Planned commercialization of research outputs was yet to start. Training/apprenticeship for students at MMISC had started.
	Industrial and technological incubation	528,033,000	60,000,000	4.00	2.00	4.79	13 in-house incubatees supported. Technical support was provided to Kiruhura Creameries Cooperative Society Limited and Krystal Ice Ltd
	Model value addition centre establishment	641,971,000	125,017,876	4.00	1.00	5.82	Installed sterilizer at Rukarara Palm oil project - Kanungu and established an essential oils pilot plant has in Tongo community in Luwero District.
	Facility repair and maintenance	1,000,000,000	191,004,000	4.00	0.70	8.31	Air compressor installed and three phase power was extended to textiles laboratory at Namanve. Maintenance of Maziba wine factory was done
	Industrial Skills development and capacity building	600,000,000	12,000,000	22.00	6.60	5.44	106 Ugandans in textiles technologies. 15 members of the United South Sudanese Urban Refugees Community (USSURC) in the production of Laundry and Cosmetics products.



Sub-programmes	Output	Annual Budget ( Ug shs)	Cum. Receipt ( Ug shs)	Annual Target	Cum. Achieved Quantity	Physical performance Score (%)	Remark
	Popularization of research technologies	64,000,000	19,000,000	10.00	4.00	0.58	UIRI Participated and exhibited at World Science day held at Kyambogo University and hosted the PITCHFEST 2020
Project: 0430 Uganda Industrial Research Institute	Government buildings and administrative infrastructure	400,000,000	150,000,000	1.00	1.00	3.63	The UIRI installed a 1250 kva generator, fuel reservoir tank (10,000l) and stone pitching of the drainage channel at MMISC was completed
	Purchase of office and ICT equipment including software	780,000,000	107,500,000	10.00	1.00	5.13	Assorted office and ICT equipment
	Purchase of Specialised Machinery & Equipment	4,316,000,000	2,195,500,000	9.00	3.00	25.64	Equipped the textiles quality testing laboratory at MMISC and fabricated a mixing tank for Koboko cosmetic factory.
	Programme Performance ( Outputs)					83.8	Good Performance

Source: UIRI and field findings



## Conclusion

The programme output performance was good at 83.8% and the interventions were consistent with the NDPIII theme “Sustainable Industrialisation for inclusive growth, employment and wealth creation”. The interventions were contributing to strategic objectives one and two: “Enhance value addition in key growth opportunities and strengthen the private sector capacity to drive growth and create jobs” Commercialisation of the three layered non-medical face masks had taken shape and the textile unit at MMISC was operational. However most of the research outputs planned for commercialization were yet to be achieved due to inadequate releases. Even though apprenticeship for students from Uganda Petroleum Institute-Kigumba (UPIK) had started, training of instructors for MMISC by instructors from the People’s Republic of China was put on hold due to COVID-19 restrictions and inadequate resources.

## Recommendation

- 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 61.6%. Most recurrent sub-programmes exhibited good performance, while the development component performed fairly. Table 3.9 shows the overall performance by 31<sup>st</sup> December, 2020.

**Table 3.9: STI Sector Performance by 31<sup>st</sup> December, 2020**

Programme	Output Performance (%)
Regulation	55.3
Research and Innovation	59.6
Science Entrepreneurship	47.8
Industrial Research	83.8
Average	61.6

*Source: Author’s compilation*



## CHAPTER 4: CONCLUSION AND RECOMMENDATIONS

### 4.1 Conclusion

The overall STI Sector performance was fair at 61.6%. The MoSTI conducted consultative meetings with DLGs, National Parks Management and other stakeholders on waste valorisation and catalogued bio-economy resources and products in the Eastern Uganda region. The concept for National Technology Development and Transfer framework and Climate Science Institute were developed. Two institutions were supported in the development of Intellectual Property policy. The MoSTI through the PRESIDE funded 23 research projects aimed at developing tools, therapeutics and vaccines to combat the COVID-19 pandemic. The projects were at varying levels of progress with one project on therapeutics at human trials, while another project on tools for diagnosing COVID-19 at animal trials. Most projects were still at preliminary stages due to procurement delays of essential equipment and a few had not started.

The MoSTI supported 14 innovations with an objective of commercialisation, however out of the seven monitored projects only four had products on the market.

The performance of the NSTEIP project was fair and was behind schedule. Site grading, topographical and cadastral surveys for NSTEIC at Rwebitete Kiruhura District and TIBIC at Namanve were completed. The extension of utilities (water and electricity) was done for the TIBIC site. The project procured a consultancy firm to develop management and operational framework and guidelines for the TIBIC & NSTEIC as well as the instructional curriculum.

Good progress was observed under Kiira Motors Corporation with construction of the Vehicle Assembly Shop facilities phase 1 at 68% progress. One diesel bus was built in collaboration with Luweero Industries Limited. The KMC acquired 2sq miles of land in Kayunga district for the establishment of an Automotive Industrial and Technology Park.

Construction of the grainage, silk worm rearing, reeling and re-reeling facilities under the Sericulture Project was at 85% physical progress. The project received a 140% budget however, it not did cause a commensurate change in the targets and outputs for the FY2020/21. It was observed that the project had not been approved by the MFPED Development Committee and does not have clearly spelt deliverables over the four-year period.

The Banana Industrial Research and Development Centre (BIRDC) acquired UNBS certification for raw and instant *Tooke* flour products. Even though BIRDC was registered in FY2019/20, the governance framework for the company is yet to be finalised. The commercialisation of the pilot plant and research laboratories was still pending.

Under the UIRI, the operationalisation of the Manufacturing, Machining and Industrial Skilling Centre (MMISC) at the Kampala Industrial and Business Park-Namanve was underway. The UIRI recruited eight staff and equipped the textiles quality testing laboratory at MMISC-



Namanve. The UIRI commercialised the production of the three layered non-medical face mask, however commercialisation of the other planned four research outputs was yet to be realized. Training of the recruited instructors/staff at MMISC had not started due to the COVID-19 pandemic that affected movement of trainers from the People's Republic of China.

The sector is faced with poor prioritisation of key STI interventions, leading to low achievement of sector outputs and delayed implementation of projects.

#### 4.2 Sector Challenges

1. The sector is faced with infrastructure gaps to undertake science, technology and innovations from research to commercialisation.
2. Low uptake of scientific research findings and lack of entrepreneurship skills.
3. Low preparedness to implement development projects.
4. Delayed commercialisation of the banana pilot plant at PIBID.
5. The Sericulture Project yet to be approved by the MFPED Development Committee and lacks clear terms and conditions between Government and other stakeholders.
6. The sericulture project is doing huge investments on land whose legal ownership is not clear
7. Inadequate funding for the KMC according to the approved four-year roadmap.
8. Poor performance of the NRIP projects in regard to commercialisation.

#### 4.3 Recommendations

1. 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.
2. The MoSTI should expedite the development and implementation 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.
3. The MoSTI should enhance capacity of implementing agencies to avoid project delays.
4. The MoSTI should approve the governance board for KMC and PIBID and separate research from pilot plant activities.
5. The MoSTI should strengthen the relationship with Tropical Institute of Development Innovations (TRIDI) in terms of binding agreements to protect and safe guard public investments.
6. The MoSTI should demand for alignment of activities/outputs of the beneficiaries across programmes to the project objectives.



7. The MoSTI should guide the project and prioritize legal acquisition of the land where investment has been made to safeguard public interests.
8. The MoSTI should provide technical support to NRIP beneficiaries to commercialise the innovations and ensure value for the disbursed funds.
9. The MFPED should cause an audit of the NRIP Fund and sericulture subvention to ensure value for money.



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