PARLIAMENT
REPUBLIC OF TRINIDAD AND TOBAGO

LASCSA

# 4th Report

JOINT SELECT COMMITTEE ON

LOCAL AUTHORITIES, SERVICE COMMISSIONS AND STATUTORY AUTHORITIES *(INCLUDING THE THA)*

on

## An Inquiry into the role of NIHERST as it pertains to the development of the STEM in Trinidad and Tobago

**First Session (2020/2021), 12th Parliament**

# 4th Report

## of the

## Joint Select Committee on Local Authorities, Service Commissions and Statutory Authorities (including the THA)

## on

## An inquiry into the role of NIHERST in the development of Science, Technology, Engineering and Mathematics (STEM) Sector of Trinidad & Tobago

**First Session (2020/2021), Twelfth Parliament**

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## Committee Membership

| | |
|---|---|
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| | |
|---|---|
| Mr. Julien Ogilvie | Secretary |
| Ms. Khisha Peterkin | Assistant Secretary |
| Ms. Terriann Baker | Graduate Research Assistant |
| Ms. Nicole Brown | Graduate Research Assistant |

## Publication

An electronic copy of this report can be found on the Parliament website using the following link:

## Contacts

All correspondence should be addressed to:

The Secretary
Joint Select Committee on Local Authorities, Service Commissions and Statutory Authorities (including the THA)
Office of the Parliament
Levels G-7, Tower D
The Port of Spain International Waterfront Centre
1A Wrightson Road Port of Spain Republic of Trinidad and Tobago
Tel: (868) 624-7275 Ext 2277, 2627 Fax: (868) 625-4672
Email: jsclascsa@ttparliament.org

**Date Laid in HOR:** **Date Laid in Senate:**

## ACRONYMS AND ABBREVIATIONS

| ABBREVIATION | ORGANISATION |
|---|---|
| CSO | Central Statistical Office |
| ECLAC | Economic Commission for Latin America and the Caribbean |
| FabLab | Digital Fabrication Laboratory |
| ICT | Information Communications Technology |
| MOE | Ministry of Education |
| NALIS | National Library and Information System Authority |
| NIHERST | National Institute of Higher Education, Research, Science and Technology |
| STI | Science Technology and Innovation |

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# EXECUTIVE SUMMARY

1.1 On Wednesday February 03, 2021, the Committee resolved to inquire into the role of the National Institute of Higher Education, Research, Science and Technology (NIHERST) in the development of Science, Technology, Engineering and Mathematics (STEM) Sector of Trinidad & Tobago and agreed that the following three (3) objectives would guide the inquiry:

i. **To examine the role of NIHERST in the development of Science Technology and Innovation (STI) policy to facilitate economic diversification**

ii. **To assess the challenges faced by NIHERST in fulfilling its mandate.**

iii. **To examine the extent to which NIHERST has influenced the development of tertiary education and training in STEM**

1.2. Further to this, on March 24th, 2021, the Committee convened a public hearing with NIHERST and the Ministry of Education.

1.3. Some of the issues which were highlighted during the course of the inquiry included:

- **The importance of STEM in creating opportunities for economic growth and development;**
- **NIHERST's key achievements;**
- **The impact of the Covid-19 pandemic on NIHERST's operations;**
- **The relationship between the Ministry of Education and NIHERST;**
- **The policy environment in which NIHERST operates;**
- **NIHERST's public relations and communications strategy;**
- **Human Resource and financial constraints experienced by NIHERST;**
- **The benefits that are being derived from stakeholder collaboration and partnerships**

- **NIHERST's future plans**

1.4. From observations made during this inquiry, the Committee has proffered recommendations which it believes will appropriately address the challenges identified based on the evidence received. A summary of these recommendations follows this Executive Summary.

1.5. The Committee looks forward to reviewing the line Ministry's response to this Report, which becomes due, sixty (60) days after it is presented to the Houses of Parliament.

# SUMMARY OF RECOMMENDATIONS

## Short-term Implementation

**The Committee recommended that the following be implemented in the short-term (3-6 months):**

i. **The Committee endorses NIHERST's recommendation for the appointment of a Chief Scientific Advisor to the Prime Minister and Scientific Advisors to specific government ministries and the Chief Parliamentary Counsel.**

ii. **The Committee also endorses NIHERST's recommendation for there to be coordination with relevant stakeholders from the public sector and academia for the creation of scholarships and sabbatical opportunities for STEM practitioners under the proposed Science and Technology Fund.**

iii. **Further to the endorsements of the above, the Committee recommends the involvement of the following entities in collaborating with NIHERST towards the development of STEM-based economic activities in Trinidad and Tobago:**
   - **The Ministry of Digital Transformation**
   - **Evolving Tecknologies and Enterprise Development Company Limited (e TecK)**
   - **The Ministry of Trade and Industry**
   - **The Ministry of Energy and Energy Industries**
   - **The Ministry of Planning and Development.**

iv. **The Ministry of Education is challenged to develop an implementation schedule to address key findings of NIHERST's studies relevant to teaching and learning by the second quarter of 2022.**

v. **NIHERST should play an integral role in consulting with all relevant state entities towards developing implementation plans in light of NIHERST's findings toward the development of the STEM sector. Notwithstanding NIHERST's capacity to conduct research, NIHERST must ensure that its limited resources are being utilised to execute research that should rightfully be done by the competent authority.**

vi. **As part of its response to this report, NIHERST should provide a status update on the findings of the following:**

1. **The ICT and Web Development SIM Study**
2. **The Tourism SIM Study**
3. **Proposal to advance the strengthening of secondary school teachers' capacity to deliver on the CAPE Animation and Game Design Syllabus.**

vii. **As part of its response, NIHERST should provide an update on the following:**

- **Establishing a formal relationship with the Public Service Academy to provide training for Public Servants in research methodologies and practice.**
- **The partnership with WASA in developing a rainwater harvesting system for water-scarce communities.**
- **Plans to meet with the Ministry of Planning and Development to discuss conducting a manpower audit of the STEM sector in Trinidad and Tobago.**
- **Collaboration with the Intellectual Property Office of the Attorney General and Ministry of Legal Affairs to treat with Intellectual-Property related issues.**
- **Availability of technical and analytical support and peer reviews to key national institutions.**

viii. **NIHERST should improve its communications, promotions and marketing strategy geared towards improving its public engagement based on an assessment of the gaps in its current strategy.**

ix. **As part of its response to this report, NIHERST should provide the**

**Committee with a revised plan for income generation in light of Covid-19 restrictions.**

x. **NIHERST should consult with the Intellectual Property Office to secure patents and other legal protections for its Intellectual Property.**

xi. **As part of its response, NIHERST should provide the committee with an update on:**
- **Its Human Resources needs and filling of vacancies; and**
- **Efforts to new obtain new location to house its Head Office and NSC.**

xii. **As part of its response, NIHERST should provide a status update on the process of acquiring the UTT Campus in O'Meara.**

## Medium-term Implementation

**The Committee recommended that the following be implemented in the medium-term (6-12 months):**

i. **NIHERST and the Ministry of Education should develop a collaborative relationship to assess the current Bursaries and Scholarships offered by the MOE to determine whether there is sufficient emphasis given to the areas needed to propel the STEM sector in Trinidad and Tobago.**

ii. **Tertiary Institutions should collaborate with NIHERST and STEM-related Businesses to develop a STEM audit to assess the gaps between STEM education at the tertiary level and employability of graduates.**

iii. **Tertiary institutions should collaborate with NIHERST, the public and private sector to expand STEM-based internships available to students to improve employment opportunities for graduates.**

iv. **NIHERST should collaborate with the MOE and the Ministry of Youth Development and National Service and tertiary institutions to develop targeted STEM-based career guidance and mentorship programmes for students. These programmes could feature individuals who have been able to succeed locally in STEM-based careers.**

## Long-term Implementation

**The Committee recommended that the following be implemented in the long-term (12-24 months):**

i. **Based on its success in producing vital research on science and technology, NIHERST could consider offering its services as paid STEM consultants to regional and international governments desirous of developing the STEM sector in their respective jurisdictions.**

# INTRODUCTION

2.1. STEM is defined as "an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, and mathematics in contexts that make connections between school, community, work, and the global enterprise enabling the development of STEM literacy and with it the ability to compete in the new economy."[1]

2.2. The National Institute of Higher Education, Research, Science and Technology (NIHERST) was established as a statutory body by Act No. 20 of 1984 [Chapter 39:58]. Since its establishment, NIHERST has pursued its mandate to promote the development of science, technology and higher education in Trinidad and Tobago, and enhance the innovative, creative and entrepreneurial capabilities of the general population. The fulfilment of this mandate has been guided both by changes in national development priorities and government's policy imperatives.

2.3. The line ministry responsible for NIHERST is the Ministry of Education.

2.4. The mandate of NIHERST is as follows:

i. To conduct research and intelligence gathering with the aim of shaping science policy and guide the funding of research and development (R&D);
ii. To promote innovation and commercialisation of technology in priority areas;
iii. To build collaborative global relationships; and
iv. To foster a culture of science, innovation and entrepreneurship.

2.5. NIHERST's approach to achieving these goals is based on the Institute's mandate and its capabilities within the matrix of related institutions. The organisation seeks to leverage its distinctive competencies to become a pivotal, internationally

[1] https://www.invent.org/blog/trends-stem/stem-define

recognised agency that facilitates the utilisation of research, science and technology in the service of economic transformation driven by innovation and competitiveness. It plays both a leadership role and a supporting role in advancing the aims of the Government of Trinidad and Tobago, and in conceptualising and driving new pathways and initiatives for public-private partnerships.

2.6. NIHERST'S key objectives are as outlined below based on the headings identified:

**i. Research and Intelligence Gathering in Support of Economic Diversification**

- To provide policy support to government in developing a national science policy and action plan; and
- To undertake science, technology and innovation (STI) policy studies in support of economic diversification; and
- To undertake international benchmarking and comparative studies on Research & Development (R&D)/STI in selected countries, regions, sectors and areas.

**ii. Promoting Innovation and Commercialisation of Technology in Priority Areas**

- To establish a sustainable private-public sector mechanism to finance start-up enterprises in priority areas and niches identified in studies by NIHERST.

**iii. Building Collaborative Global Relationships**

- To build international relationships with world-class STI institutions; and
- To undertake joint projects of relevance to the rapid creation of a sustainable, knowledge-intensive economy.

**iv. Fostering a Culture of Science, Innovation and Creativity**

- To construct a world-class National Science Centre;
- To engage all citizens in the experiential learning of science;
- To provide hands-on experience for developing capabilities in technological innovation and entrepreneurship; and
- To recognise excellence in STI through national awards and publications.

**v. Positioning NIHERST as a World-Class STI Institute**

- To restructure NIHERST; and
- To re-brand the organisation as a world-class STI institute; and
- To consolidate its offices.

## INQUIRY RATIONALE

2.7. Trinidad and Tobago's Vision 2030 document states that one of the country's weaknesses is that, "with the exception of the energy sector, Trinidad and Tobago does not produce significant amounts of technologically-advanced goods, services and exports." The report further states, "our challenge is amplified by the rapid advances in technology as Trinidad and Tobago is continuous 'playing catch-up' to the new and changing technologies which are increasingly driving international trade and development, and ultimately making it more difficult to be globally competitive."[2] In light of these findings, the inquiry looks at NIHERST's role in advancing the STEM sector in Trinidad and Tobago in a way that improves Trinidad and Tobago's competitiveness on the global scale.

[2] Vision 2030, page 36

## BACKGROUND RESEARCH

### Science & Technology and Economic Benefits

2.8. In today's globalised world, a country's prosperity depends on its ability to generate new ideas and convert knowledge into socio-economic benefits. Technology enhances these capabilities and, in this regard, the ability to create and adopt technology is increasingly essential for firms to compete and prosper.[3]

### Technology

2.9. It is anticipated that by 2030, ICT will be pervasive and dictate human activity. By then, Information and Communications Technology will continue to radically transform society. The rise of social media will create a more interconnected world as electronic devices collect and exchange information.

2.10. At the same time, more machines will be working autonomously and technology will replace routine work. By 2030, many more countries will provide free wireless internet hotspots, more cabinet meetings will be held online, most people will bank on the internet, voters in a general election will cast their ballots online and most routine transactions between persons and the government will be via the internet. Also, due to the rapid changes in technology a new range of occupations and job titles such as Human Organ Engineer, Climate Change Reversal Specialist and Memory Augmentation Surgeon will be in vogue in 2030.

### Implications for Trinidad and Tobago

2.11. To surmount these trends, citizens of Trinidad and Tobago must possess 21st century skills, including technological know-how, and become multilingual and multi-skilled. This will help the country capitalise on trade and growth opportunities in expanding markets such as China.

[3] Vision 2030, page 38

2.12. Technological advancements are expected to lower production costs in some sectors and therefore it is likely that there will be much more competition from imports. Local producers must therefore be prepared to embrace and incorporate new and advanced technologies in the production of goods and in the delivery of services.

2.13. There is an urgent need for persons to reskill, retool and engage in lifelong learning in order to capitalise on potential, new work opportunities. This requires a relevant, flexible education system, particularly at the tertiary level, that is aligned to a world where technology plays a major role in the workplace. At the same time, as the world shifts to alternative energy and sustainable production, businesses must now focus on added value products and services, so that the shortfall in foreign exchange earnings can be met.

## Methodology for Obtaining Evidence

2.14. A virtual public hearing was held via the Zoom Video Conferencing application with representatives of NIHERST and the Ministry of Education on Wednesday March 24, 2021.

2.15. The following witnesses represented NIHERST:

- Mrs. Marlene Lord-Lewis — President
- Ms. Nandi Ogiste — Registrar (Ag.)
- Ms. Lovaan Superville — Vice President, Science and Technology (Ag.)
- Mr. Pedro Britton — Senior Accountant
- Ms. Julie David — Senior Policy Analyst

2.16. The following witnesses represented the Ministry of Education:

- Mr. Kurt Meyer — Permanent Secretary (Ag.)
- Mrs. Lisa Henry-David — Chief Education Officer (Ag.)

2.17. Both NIHERST and the Ministry of Education provided the Committee with written submissions.

2.18. The Minutes and Verbatim Notes relevant to the Committee's public hearing with the CLFA, are attached as Appendix V and Appendix VI respectively.

# Summary of Evidence, Findings and Recommendations

## Objective 1: To examine the role of NIHERST in the development of Science Technology and Innovation (STI) policy to facilitate economic diversification

### Relationship with the Ministry of Education

3.1.1. The Ministry of Education's vision for NIHERST is:

- for the organisation to be a key driver in pushing a Science, Technology, Engineering and Mathematics (STEM) agenda in Trinidad and Tobago; and
- for the use of technology in the current virtual learning environment provides further opportunities for school-aged children to develop an interest in STEM.

3.1.2. The Ministry therefore sees NIHERST as a vehicle for bringing technology into the classroom setting for all students from Early Childhood Centres to Secondary Schools.

3.1.3. In an effort to ensure the compliance of the Institute, the Ministry of Education, in its capacity as Line Ministry, and ln accordance with the monitoring mechanism contained in the State Enterprises Performance Monitoring Manual (SEPMM) conducts a continuous review of the Institute, through specific monitoring indicators and the submission of reports by NIHERST in respect of the following:

a. Strategic Plan;
b. Board Minutes;
c. Annual Audited Financial Statements;
d. Administrative Reports;
e. Internal Audit Reports;
f. Return of the Award of Contracts;
g. Litigation Proceedings;

h. Monthly Cash Statement of Operations/ Monthly Cash Flow Statements;

i. Quarterly Returns Reports.

3.1.4. The Ministry of Education, in its written submission indicated that it facilitates requests from the NIHERST to conduct periodic surveys among primary and secondary schools. **While copies of the Report are submitted to the Ministry of Education, the findings are not normally utilized by the Ministry**. NIHERST also provides opportunities for teachers and students at the primary and secondary levels to explore STEM education.

3.1.5. The MOE expressed concerned about under-performance of students in the sciences and other areas. The Ministry is in the process of providing support for these students. They require additional research on the issues affecting teaching and learning in order to develop solutions for these challenges.

3.1.6. The Ministry of Education has provided funding to the NIHERST in the amount of $160.7Mn over the period 2015/2016 to 2019/2020. Funding in respect of recurrent expenditure from the Estimates of Recruitment Expenditure amounted to $112.8Mn and funding in respect of the Public Sector Investment Programme (PSIP) amounted to $47.8Mn. Details are provided in Table 1 below.

**TABLE 1 MOE FUNDING PROVIDED TO NIHERST**

| Year | Recurrent Expenditure | PSIP | Total |
|---|---|---|---|
| 2015/2016 | $36,613,368 | $31,200,000 | $67,813,368 |
| 2016/2017 | $23,286,635 | $13,170,000 | $36,456,635 |
| 2017/2018 | $20,948,687 | $2,105,000 | $23,053,687 |
| 2018/2019 | $13,940,683 | $560,000 | $14,500,683 |
| 2019/2020 | $18,000,000 | $848,000 | $18,848,000 |
| **Total** | **$112,789,373** | **$47,883,000** | **$160,672,373** |

3.1.7. As the line Ministry, the Ministry of Education has an oversight role of the Institute to ensure good governance and the efficient use of resources. The Ministry ensures the appointment of the Board of Governors of the Institute which has responsibility for managing the affairs of the institution and fulfilment of its mandate. The Board of Governors is responsible for planning, monitoring and controlling the activities of the Institute to ensure the optimal utilisation of its resources and achievement of its objectives.

## Policy Environment

3.1.8. During the March 24, 2021 public hearing, the Committee learnt that the draft National Science and Technology Policy was completed in 2014 but was not submitted to the MOE until March 2021. An indication was given that the Policy would be revised within a six-month period.

3.1.9. NIHERST also indicated in the March 24, 2021 public hearing that Science, Innovation and Technology is the engine of growth for economic prosperity.

3.1.10. NIHERST prepared a strategic plan for the period 2019-2022. This strategic plan included development of a virtual platform. Due to the Covid-19 pandemic, plans to use and develop the virtual platform have been accelerated. Some of the planned initiatives include virtual camps and virtual field trips. Due to the Covid-19 pandemic, plans to use and develop the virtual platform have been accelerated. Some of the planned initiatives include virtual camps and virtual field trips.

3.1.11. NIHERST has the capacity to hire staff but must receive approval from the MOE.

## The Digital Fabrication Lab

3.1.12. The Digital Fabrication Lab (Fab Lab) is located at the National Science Centre in Maloney and was established to stimulate ICT-enhanced entrepreneurship in Trinidad and Tobago. Plans for training includes topics such as Intellectual Property, Project Management and Computer-Aided Design (CAD).

3.1.13. The Fab Lab has provided virtual training during the Covid-19 pandemic.

3.1.14. NIHERST aims to expand the scope of the Fab Lab to become a Fab Academy, which will reach a wider range of entrepreneurs who are equipped to develop innovative products and prototypes.

## Partnerships and Stakeholder Engagement

3.1.15. There is currently no formal relationship with the Public Service Academy to provide training for Public Servants in research methodologies and practice. However, this is something NIHERST is willing to explore.

3.1.16. NIHERST has partnered with the Water and Sewerage Authority (WASA) in developing rainwater Harvesting Systems for water-scarce communities.

3.1.17. NIHERST plans to meet with the Ministry of Planning and Development to discuss conducting a manpower audit of the STEM sector in Trinidad and Tobago with a view to identify future employment prospects in the industry. However, a time frame for this meeting was not given.

3.1.18. NIHERST is working with the Intellectual Property Office of the Ministry of the Office of the Attorney General and Ministry of Legal Affairs to treat with Intellectual Property-related issues and have developed a draft MOU to address the same.

3.1.19. NIHERST has made technical and analytical support as well as peer reviews available to key national institutions subject matter expertise.

## NITHERST'S Key Research Initiatives

3.1.20. Form NIHERST's written submission, the Committee learnt that the Institute established a Policy Research and Intelligence Unit in October 2012.

3.1.21. NIHERST coordinated six (6) stakeholder consultations in the development and drafting of a national science and technology (S&T) policy. The Policy included the establishment of a national S&T fund.

3.1.22. NIHERST has been able to Leverage in-house capability in economics to undertake the following:

- Science Technology and Innovation (STI) studies and surveys in support of Economic Diversification; and
- Sectoral Innovation Mapping (SIM) Studies Targeting Priority Sectors in Trinidad and Tobago.

3.1.23. In their written submission, NIHERST indicated that they completed initiatives under the following headings:

- Research and intelligence gathering to shape science policy and guide the funding of research and development (R&D);
- Promoting innovation and commercialisation of technology in priority areas;
- Building collaborative global relationships; and
- Fostering a culture of science, innovation and entrepreneurship.

3.1.24. A complete description of the achievements under these headings can be found at Appendix I. Table 2 below summarises the main research products generated by NIHERST and their descriptions.

**TABLE 2 SUMMARY OF RESEARCH PRODUCTS GENERATED BY NIHERST**

| Research Products | Description | Main Consumer(s)/Users |
|---|---|---|
| **S&T Surveys** | a) Survey of Science and Technology (S&T Indicators) 2011–2020: This is an annual survey designed to measure the investment in S&T in Trinidad and Tobago by gathering data on financial and human resources dedicated towards S&T.<br><br>b) **Public Perception of Science, 2012:** This survey was the second of its kind to be conducted by NIHERST as a similar study was undertaken in 2005. The results of this study measured changes in attitudes towards S&T over time.<br><br>c) Survey of Environmental Awareness and Practices, 2013: The empirical results of this second study on environmental awareness and practices were intended to assist in monitoring public knowledge, attitudes and behaviour towards the environment and sources of information about the environment through a number of key indicators and monitor changes over time. | Ministry of Planning and Development |
| STEM Education Surveys | STEM education surveys provide insights into the teaching of STEM at the primary and secondary school levels. These studies focused | Ministry of Education |

| | | |
|---|---|---|
| | on the following factors that affect teaching and learning outcomes:<br>1. Teachers' qualifications and training needs<br>2. Adequacy of teaching materials, textbooks and equipment<br>3. Areas of difficulty – teaching and understanding<br>4. Teaching and assessment methods<br>5. Access to STEM education workshops and professional literature<br>6. Students' attitudes towards STEM subjects and occupations<br>7. Changes in Science and Mathematics education over time. | |
| **Innovation Surveys** | NIHERST has been conducting innovation surveys in the Manufacturing sector since 2006.<br><br>During the last 10 years the Institute completed three (3) innovation surveys in sub-sectors of the Manufacturing Industry.<br><br>These innovation studies were designed to collect data on the innovative activities of establishments in the manufacturing sector.<br><br>Innovation studies focused on types of innovation; obstacles to innovation; drivers of innovation; government's support for innovation; impact of innovation; linkages in the industry and resources allocated to innovation.<br><br>These surveys were undertaken to | Ministry of Planning and Development<br><br>Ministry of Science and Technology (2011 - 2015)<br><br>The Network for Science and Technology Indicators – Ibero-American and Inter-American (RICYT)<br>Regional S&T Institutions<br>Manufacturing Sector<br><br>Policy-makers and decision-makers<br><br>Researchers |

| | | |
|---|---|---|
| | provide data on the current innovative capacity of the manufacturing sector from which data driven policies could be developed to promote innovation in the industry and to transform businesses into globally competitive businesses. | |
| **Sectoral Innovation Mapping Studies (SIMS)** | a. **Animation Industry, 2018:** The SIM of the Animation Industry in Trinidad and Tobago (2018) identifies internal and external actors of the sector: Industry Practitioners, Education and Training Institutions and Supporting Institutions. The SIM provides a snapshot of the linkages between actors and highlights the challenges within the enabling environment.<br><br>b. **Energy Services, 2019:** The SIM unveils the actors, their interactions and the activities that initiate, import, modify and diffuse new technologies. It is anticipated that the SIM will inform government's efforts in diversifying the energy sector towards the exportation of energy services and energy-related innovations in products and processes. | Animation SIM: government officials from Ministry of Trade and Industry and Ministry of Planning and Development<br><br>FilmTT and consultants have also used the document asking for the conduct of further research in this subject area.<br><br>Energy Services SIM: Graduate students both at the Masters and PhD levels from Arthur Lok Jack have asked for the document and wished to cite it in their work.<br><br>Consultants have also asked for this document.<br><br>UTT's Faculty of Process Engineering have read it, offered congratulatory remarks and based on the work completed wished to partner with NIHERST in delivering on a grant funding application. |

## Findings of Surveys and Studies Conducted by NIHERST

3.1.25. The Sectoral Innovation Mapping (SIM) Study of Strategic Sectors of the Economy is one of two types of research studies captured under a PSIP project titled "STI Mapping and Priority Setting Programme". There are **five (5) SIM studies and one (1) technology mapping (TM) study under this PSIP project**.

3.1.26. Of the five (5) SIM studies listed in this PSIP project, research pursuant to three SIMs has been conducted. The SIM Study on the Animation Industry was completed and published in February 2018. The Energy Services Sectoral Innovation Mapping Study was completed and published in June 2019.

3.1.27. At the time of the Public Hearing, the ICT Software and Web Development SIM was near completion and was expected to be published by May 2021. Completion of this SIM study and commencement of the Tourism SIM study was delayed largely owing to resource constraints.

3.1.28. The economic sectors selected for SIM research include the Animation, the Software and Web Development Industries, Energy Services, Tourism and Finance. The Technology Mapping study will focus on identifying the areas in need of technological upgrades of the Food and Beverage sector.

3.1.29. The findings of the SIM on the Animation Industry and the SIM on the Energy Services Industry studies have been summarized in Table 3 below.

**TABLE 3 FINDINGS OF THE SIM ON THE ANIMATION INDUSTRY AND SIM ON THE ENERGY SERVICES INDUSTRY**

| Study | Key Findings |
|---|---|
| SIM Study on the Animation Industry | The local Animation sector has tremendous potential to become a significant generator of new revenue streams for the local economy.<br><br>The global Animation industry valued at |

| | |
|---|---|
| | US$244 billion in 2015 is still growing and has room for new entrants.<br><br>Animation is an innovative industry enabled by technology and human creativity.<br><br>Linkages between certain categories of actors need strengthening e.g., the linkages between the industry practitioners and local content distributors, and between industry practitioners and financial institutions.<br><br>Local studios can leverage a Caribbean brand rendering animated services to the global niches of this industry such as entertainment animation, education animation, engineering animation, manufacturing animation and medical animation. |
| The Energy Services Sectoral Innovation Mapping Study | As of June 2019, there were approximately 400-500 firms operating in the local Energy Services Sectors (ESS). By definition, the ESS includes all the services contracted by the entire oil and gas sector value chain that require oil and gas sector specific knowledge, skills and competencies.<br><br>Product and process innovations were the two dominant types of innovation developed by the local ESS.<br><br>T&T's professional and technical and skilled workers are reputed for their knowledge and the supply of services rendered in geological works, directional drilling, well logging, completion, cementing, mud engineering, platform fabrication, inspection, the design and conduct of practical skills training |

| | |
|---|---|
| | programmes and platform and pipeline maintenance.<br><br>The innovations listed in the study, though not exhaustive, were developed either locally or in partnership with global associates, adopted and diffused into the local oil and gas sector. A characteristic of some of these innovations was their intersectionality namely their applicability across industries. |

3.1.30. There were official launches of the findings for the studies. In attendance were relevant stakeholders from academia, industry and the public sector. The completed SIM studies were also uploaded onto the NIHERST website for visitors to view and download the documents. Reviews on the Animation and Energy Services SIM studies were completed by high level officers from the Ministry of Planning and Development, the Delegation of the European Union to Trinidad, Cambridge University and the Ministry of Science and Innovation in Barbados. These reviews are available on the NIHERST website.

3.1.31. Additionally, in response to a gap identified on the Animation Action Plan, a proposal was prepared to advance the strengthening of secondary school teachers' capacity to deliver on the CAPE Animation and Game Design Syllabus. Unfortunately, the COVID -19 pandemic interrupted this initiative.

3.1.32. Table 4 below outlines the surveys conducted over the past five (5) years and the status of each.

**TABLE 4 STATUS OF SURVEYS COMPLETED (2015-2020)**

| Survey | Start date | Completion date |
|---|---|---|
| Survey of S&T Indicators, 2015 | 1 October 2015 | 30 June 2016 |
| Survey of Mathematics in | 1 January 2016 | 30 June 2017 |

| | | |
|---|---|---|
| Secondary Schools, 2016 | | |
| Survey of Mathematics in Primary Schools, 2017 | 1 January 2017 | 1 September, 2018 |
| Survey of S&T Indicators, 2016 | 1 October 2016 | 30 June 2017 |
| Survey of S&T Indicators, 2017 | 1 October 2017 | 30 June 2018 |
| Survey of S&T Indicators, 2018 | 1 October 2018 | 30 June 2019 |
| Survey of Innovation in the Tourism Sector, 2019 | 1 October 2019 | (Not completed due to low response rate from the industry) |
| Survey of ICT in Secondary Schools, 2020 | 1 January 2020 | (Interrupted by COVID-19 pandemic) |
| Survey of S&T Indicators, 2020 | 1 January 2020 | 31 August 2020 |

3.1.33. Major findings of the Surveys of S&T Indicators 2015 – 2020 include:

i. Investments in R&D over the period 2014 to 2018 was below 1% of GDP. Growth in expenditure on R&D as a percentage of GDP was negligible during the five-year period.

ii. Expenditure on R&D declined over the five-year period from TT$144.64M in 2014 to TT$131.10M in 2018.

iii. The business sector continued to pose a challenge when undertaking the S&T Indicators survey. Therefore, the data does not represent the entire business sector.

iv. The number of researchers increased by 37.4% over the five-year period from 1,228 in 2014 to 1,687 in 2018.

v. The Institute began capturing Researchers by Full-time Equivalent (FTE) in the 2018 survey as this was the indicator required for international reporting. The number of FTE researchers in 2018 was 788 compared to the 1,687 headcount.

vi. The total number of graduates from public higher education institutions

increased from 3,774 in 2016 to 3,981 in 2019. In addition, females outnumbered their male counterparts in all faculties except Engineering. Of the total graduates in 2019, 12.8% were in S&T and 12.6% in Engineering.

3.1.34. Major findings of the Survey of Mathematics in Secondary Schools, 2016 include:

i. The majority (82%) of teachers reported an undergraduate degree as their highest educational qualification and 12% indicated a post-graduate degree. Of the teachers who possessed a university degree, 47% had a degree in Mathematics.
ii. Compared to the study undertaken in 2006, the data showed a decrease in the percentage of teachers without professional training from 60% in 2006 to 46% in 2016.
iii. Over a half (55%) of the Mathematics teachers who participated in the study stated that teaching was their first choice as a career while 45% indicated that it was not.
iv. The majority (73%) of teachers indicated that they were not desirous of changing to another career.
v. A comparison of the results of the study to the 2006 survey results showed an increase in the percentage of teachers desirous of changing to another career from 19% in 2006 to 24% in 2016.
vi. A significant percentage (85%) of the sample of Mathematics teachers indicated that there was a need for more professional development workshops for the effective teaching of Mathematics. The main topics identified by teachers for future workshops were curriculum (16%), teaching methods (15%), use of technology to teach Mathematics (11%) and classroom management (10%).
vii. With regard to assistance required in teaching areas, the data revealed that teachers required the most assistance in using audio visual resources and diagnosis and remediation.

viii. Approximately one-third (31%) of the sample of secondary school students identified Algebra as the most difficult area of the Mathematics syllabus to understand, followed by Geometry (14%) and Trigonometry (13%).

ix. Compared to the results of 2006, the data showed that the percentage of students who had computers available at home increased from 61% in 2006 to 90% in 2016.

3.1.35. Major findings of the Survey of Mathematics in Primary Schools, 2017 include:

i. Most principals (88%) stated that numeracy was a component of their school development plan while 9% reported that it was not.

ii. The main suggestions principals provided to improve students' performance in Mathematics at the primary level was the teaching of concepts using manipulatives (28%), followed by increasing teacher development (27%) and making Mathematics more hands-on and fun (18%).

iii. Compared to a similar study undertaken in 2007, the data showed an increase in teachers' qualification in education. The percentage of teachers with a B.Ed. degree increased from 8% in 2007 to 56% in 2017, while teachers with a M.Ed. qualification increased from 2% in 2007 to 8% in 2017

iv. The majority (84%) of teachers surveyed reported an O Level/CSEC pass as their highest qualification in Mathematics while 7% obtained an A Level/CAPE pass and 3% and 2% possessed a diploma and bachelor's degree respectively.

v. The survey results reveal that teachers were divided on what was the most difficult topic for students to conceptualise. Thirty percent (30%) of the teachers identified Numbers as the most difficult topic for students to conceptualise, followed closely by Measurement (29%) and Geometry (28%).

vi. Compared to the study undertaken in 2007, the data show an increase in the level of difficulty for students in all topics except Numbers which decreased from 58% in 2007 to 30% in 2017.

3.1.36. The findings of the surveys are published and forwarded to key stakeholders to inform the development of policies, programmes and initiatives to build STI capacity and improve STEM education in Trinidad and Tobago. Key stakeholders identified by NIHERST include the Ministry of Education, the Ministry of Planning and Development, the Central Statistical Office (CSO), tertiary institutions, the National Library and Information System Authority (NALIS) and the United Nations Economic Commission for Latin America and the Caribbean (ECLAC).

## Performance Indicators

3.1.37. The last ten years spans two strategic plans namely **NIHERST strategic plan 2011-2015 and more recently NIHERST strategic plan 2020–2022.** Under the NIHERST strategic plan 2011-2015, the manner in which the value of output was measured was based on the output or deliverable provided on time and within budget as well as the deliverable provided in keeping with its intent. This approach is based on a **traditional or activity-based monitoring and evaluation approach,** in which emphasis is placed on the delivery of the output.

3.1.38. Under the Institute's new strategic plan 2020-2022, the approach adopted was in keeping with **results-based or outcomes-based monitoring and evaluation approach**. The value of output extends to usability, in particular the extent of use of product as well a value of the product to intended users. It incorporates users' requests for product, users' feedback and reviews.

3.1.39. In relation to the Institute's research products, key performance indicators used under the 2011-2015 plan were the number of technical studies or policy briefs completed, i.e. number of research products completed per area of study.

3.1.40. In 2020-2022, performance indicators used are number of users per study, number of committees with NIHERST representation and number of data requests per study. Also included was the percentage of full time qualified staff conducting research, which relates to the building of the Institute's capacity in policy, research and intelligence gathering.

3.1.41. In terms of initiatives covered under the focus area research and intelligence gathering, in 2011-2015, it is important to note that all listed initiatives, with the exception of S&T policy development, were new initiatives. The majority of these initiatives identified the securing of consultancies to conduct the required work.

3.1.42. Work commenced on 75% of feasible initiatives (or 6 out of 8 initiatives) namely S&T policy development, technical support to listed bodies, business feasibility studies, technical studies to support development of 5 growth poles, comparative studies on competitiveness and innovation as well as development of a knowledge management ecosystem for NIHERST.

3.1.43. 25% of (or 2 of 8) feasible initiatives were completed. Priority was placed on S&T policy development. The draft S&T policy was developed in 2014 and not 2012 as planned. This was in large measure due to the required human resources not being obtained until October 2012, therefore consultations towards the development of the S&T policy commenced in the first quarter of fiscal year 2013. All work was also completed in the area of technical support, both scheduled and unscheduled; a total of 18 unplanned initiatives took place. The target was therefore exceeded in the area of technical support.

3.1.44. Additional work completed during the period included the completion of 3 STEM education surveys, 3 innovation surveys and 5 annual surveys of S&T indicators.

3.1.45. The targets set for the other two initiatives were not met. These were the business feasibility studies and STI studies to support economic diversification. Work commenced on one of ten identified research areas- the smart city concept. The targets were not met largely due to limited financial and/or human resources in support of consultancies.

3.1.46. The Institute completed work in research and intelligence gathering for economic diversification by the establishment of a unit staffed by qualified policy analysts in lieu of procuring of consultancy. This had the added advantage of building internal capacity of Institute and benefitting from synergies among departments.

3.1.47. The established unit came into operation in October 2012 with the hiring of one senior policy analyst and one policy analyst. Subsequently, after completion of draft S&T policy in 2014 by this new department, research was focused on micro-level innovation studies known as Stakeholder Innovation Mapping (SIM) studies to support economic diversification in three sectors – Animation, Software and Web Development Industries and Energy Services.

3.1.48. Under the new strategic plan 2020-2022, the strategic objectives relate to Solution Oriented Research (aligned to research and intelligence gathering) and are as follows:

1. To grow the Institute's internal critical mass to generate knowledge;
2. To achieve wider acceptance and use of the Institute's research studies by private and public organisations and policy makers; and
3. To improve evidence-informed policy information at national levels.

3.1.49. Major Achievements of NIHERST during the past 5 years include the following:

1. Appointment of Executive leadership
2. Completion of a 2020-2022 strategic plan

3. The expansion of Fab Lab services to advance entrepreneurship and innovation.
4. Completed an HR Operational Efficiency Review
5. Completed consultancy on Organisation Transformation Study... The Restructuring of NIHERST
6. Board approval of top tier structure and functional areas
7. The complete list of achievements can be found at **Appendix III.**

## National Science Policy

3.1.50. The key components of the Draft Science and Technology (S&T) Policy are as follows:

1. The introduction has the background, problem statement, methodology and outline of the policy;
2. The S&T Policy Framework gives the vision, specific objectives, assumptions and guiding principles;
3. An illustration is offered mapping an existing National Innovation System of Trinidad and Tobago not created by any purposeful design;
4. The challenges hindering the building of STI capabilities;
5. The Role of Governance in STI;
6. Promoting S&T in Tobago;
7. Policy Prescriptions; and
8. The construct of a Monitoring and Evaluation (M&E_ System for the National S&T Policy. Appended to this policy document are the following key components:
    - Action Plan for the period 2014-2018
    - List of Priority Areas for Action
    - List of STEM subjects offered at Educational Institutions in T&T; and
    - S&T Statistics at a Glance.

3.1.51. The policy attempts to build a bridge between the knowledge producers and decision-makers, carving out a role for scientific and business communities to work with policy makers in setting an STI agenda that supports the diversification of T&T's economy beyond the energy and energy-based industries.

3.1.52. The policy clearly articulates the parameters (rules, regulations, international and organisational frameworks) within which stakeholders can operate to generate new knowledge and technology.

3.1.53. A Draft Science and Technology Policy was formulated and submitted in April 2014 to the then Executive Management and Board of Governors of NIHERST.

3.1.54. For the period 2013-2016, NIHERST engaged in activities commenting on policy-related documents such as the National Innovation Discussion Paper, the National Innovation Survey, the 11th European Development Fund (EDF) Multiannual Indicative Programme, development of National Services Policy, and in 2017, the Consultancy on Technological Foresight.

3.1.55. **In 2020 NIHERST submitted a paper to the Roadmap to Recovery Committee**. NIHERST has indicated that it will continue to contribute to relevant policy documents focused on the impact of STI on economic transformation.

## Digital Transformation Initiatives

3.1.56. The Institute's ongoing 5-year digital transformation initiative in content and document management, file sharing, communication and collaboration has continued at a steady pace, and yielded unexpected benefits particularly in 2020

during the COVID-19 pandemic. Digital transformation will provide ongoing development of the Institute's capability in records, document and information management to support Trinidad and Tobago's knowledge-based economy and the Institute's alignment to the Ministry of Education's Goal 1-6: to effectively govern and administer the education system.

3.1.57. With an increased online presence through the development of online programmes such as virtual tours of the National Science Centre and the availability of NIHERST publications and research products online.

3.1.58. The Institute will also expand its scope by improving the scientific and technology literacy of the national population and providing research and statistical data at a more cost-efficient pace to inform policy development, decision making and advanced research by government, industry and academia.

## Findings and Recommendations

Based on the evidence outlined in this section, the Committee concluded the following:

**i.** The NIHERST'S policy environment is well established and defined. Arguably, the services provided by NIHERST have the potential to inform policy formulation/development. However, the Committee observed that there is need for stronger or more defined linkages between the work that NIHERST executes and the needs of the users of its services.

**ii.** NIHERST's research provides an opportunity for the government of Trinidad and Tobago to engage in data-driven policy development and execution in the STEM sector.

**iii.** Given the de-linking of NIHERST from the then Ministry of Science and Technology, there is a need for a revision of the STI policy to align with its current operations under the Ministry of Education.

**iv.** While the FabLab and other initiatives have achieved commendable success in the promotion of STEM and STEM-based economic activity, there has been negligible impact on the national economy.

**v.** While a strategic plan has been developed, there is limited execution of this plan mainly due financial, human and other resource constraints.

**vi.** The increasing move toward digitisation and digitalisation during the pandemic provides an opportunity for NIHERST to take the lead in developing STEM in education.

**vii.** While NIHERST has a wide range of stakeholders it interacts with, partnerships need to be strengthened towards strategic, evidence-based implementation based on findings of research conducted by the institute.

**viii.** NIHERST's partnership with WASA in the development of rainwater harvesting for water-scarce communities demonstrates the scope for the Institute's ability to provide technical assistance and science-based solutions to the challenges faced by Ministries, Departments and State Enterprises.

**ix.** NIHERST's reports are widely available and accessible to key stakeholders in both the public and private sectors.

**x.** Whilst any research study may provide a more in-depth understanding of an issue, the Committee was not convinced that the findings of these studies are being fully utilised by stakeholders.

**xi.** Given that NIHERST's mandate is focused on policy planning, development and research, there needs to be coordination with other public sector entities for

implementation of its recommendations to take place. Support from these entities is paramount to seeing investment in STEM benefit the wider economy.

**xii.** There is a disconnect between the Ministry of Education and NIHERST with regard to incorporation of findings from NIHERST's research on the education sector. The Committee was particularly concerned that the Ministry of Education does not fully utilise the findings of NIHERST's public surveys.

**xiii.** The Committee was also concerned that though NIHERST completed a draft National Science and Technology policy, the document was not submitted to the Ministry of Education until 2021.

## Recommendations

Based on the evidence and information received by the Committee, we respectfully recommend the following:

**i.** **The Committee endorses NIHERT's recommendation for the development of the appointment of a Chief Scientific Advisor to the Prime Minister and Scientific Advisors to specific government ministries and the Chief Parliamentary Counsel.**

**ii.** **The Committee also endorses NIHERST's recommendation for there to be coordination with relevant stakeholders from the public sector and academia for the creation of scholarships and sabbatical opportunities for STEM practitioners under the proposed Science and Technology Fund.**

**iii.** **Further to the endorsements of the above, the Committee recommends the involvement of the following entities in collaborating with NIHERST towards the development of STEM-based economic activities in Trinidad and Tobago:**

- **The Ministry of Digital Transformation**

- **Evolving Tecknologies and Enterprise Development Company Limited (e TecK)**
- **The Ministry of Trade and Industry**
- **The Ministry of Energy and Energy Industries**
- **The Ministry of Planning and Development**

iv. **The Ministry of Education is challenged to develop an implementation schedule to address key findings of NIHERST's studies relevant to teaching and learning by the second quarter of 2022.**

v. **NIHERST should play an integral role in consulting with all relevant state entities towards developing implementation plans in light of NIHERST's findings toward the development of the STEM sector. Notwithstanding NIHERST's capacity to conduct research, NIHERST must ensure that its limited resources are being utilised to execute research that should rightfully be done by the competent authority.**

vi. **As part of its response to this report, NIHERST should provide a status update on the findings of the following:**

a. **The ICT and Web Development SIM Study;**
b. **The Tourism SIM Study;**
c. **Proposal to advance the strengthening of secondary school teachers' capacity to deliver on the CAPE Animation and Game Design Syllabus.**

xiv. **As part of its response, NIHERST should provide an update on the following:**

- **Establishing a formal relationship with the Public Service Academy to provide training for Public Servants in research methodologies and practice.**
- **The partnership with WASA in developing a rainwater harvesting system for water-scarce communities.**

- **Plans to meet with the Ministry of Planning and Development to discuss conducting a manpower audit of the STEM sector in Trinidad and Tobago.**
- **Collaboration with the Intellectual Property Office of the Attorney General and Ministry of Legal Affairs to treat with Intellectual-Property related issues.**
- **Availability of technical and analytical support and peer reviews to key national institutions.**

## Objective 2: To assess the challenges faced by NIHERST in fulfilling its mandate

### Future Developmental Plans

3.2.1 NIHERST's Marketing and Communications Unit has been charged with the responsibility of coordinating communication with members of the public, educational institutions and other entities interested in partnering with NIHERST.

3.2.2 NIHEST's strategic focus for the period 2020-2022 is based on the pillars outlined in Table 5 below.

TABLE 5 NIHERST'S STRATEGIC FOCUS 2020-2022

| Pillar | Area(s) of Focus |
|---|---|
| Science and Innovation for Development | - Solution-Oriented Research<br>- Solution-oriented Innovation<br>- Science Advancement<br>- Skills Development |
| Stakeholder Engagement | - Developing Strategic Partnerships |
| Appropriate Infrastructure | - Improving Accommodation/Facilities<br>- Exhibits |
| Effective and Efficient Organisation | - Human Resources<br>- Accounting<br>- Business Processes |
| Resources Mobilisation and Financial Sustainability | - Growing non-subvention revenue by 25%<br>- Acquisition of sponsor funding equal to at least 5% of operating expenditure |

## Institutional SWOT Analysis

3.2.3 NIHERST provided the committee with an institutional SWOT analysis. A condensed version of this analysis is presented in Table 6 below. The complete SWOT analysis can be found in **Appendix III.**

**TABLE 6 SUMMARY OF NIHERST'S SWOT ANALYSIS**

| | |
|---|---|
| **Strengths**<br>- Board of Governors appointed by the Government to support corporate governance<br>- Highly committed staff<br>- Subject matter experts in key areas of Science, Technology and Innovation<br>- First mover advantage in promotion and delivery of STEM | **Weaknesses**<br>- Staff vacancies in key functional areas<br>- Insufficient buy-in from internal stakeholders<br>- Insufficient contemporary skills and knowledge to achieve mandate<br>- Lack of protection of intellectual property |
| **Opportunities**<br>- Leverage use of ICT across the Institute<br>- Mobilise new technologies such as Robotics and Artificial Intelligence in the provision of new services<br>- Build brand visibility through virtualisation<br>- Expediting digital transformation through Entrepreneurship, the Fablab and assistance to the MOE in implementing hybrid and online learning | **Threats**<br>- Change in Government's focus/mandate<br>- Economic downturn<br>- Covid-19 pandemic<br>- Competition for State resources |

## Impact of Covid-19 Pandemic on NIHERST'S Operations

3.2.4 Due to the Covid-19 pandemic, plans to use and develop the virtual platform have been accelerated. Some of the planned initiatives include **virtual camps and virtual field trips.**

3.2.5 Staff health and safety during Covid-19 has been a priority. Staff are therefore rostered on a rotational basis. At the time of the public hearing, NIHERST expressed interest in exploring a work-from-home model for the future.

3.2.6 The NSC was closed to the public from March 2020 and with no alternative scenarios the lessons learnt impacted the objective: To grow non-subvention revenue by 25 % on a yearly basis.

3.2.7 The absence of a ready business continuity plan impacted goals to improve operational efficiency and effectiveness of the organisation as well as to enhance the scientific literacy of the population of Trinidad and Tobago.

3.2.8 The Survey of ICT in Secondary Schools, 2020 was launched in secondary schools in the 2nd quarter of 2020, however data collection was disrupted by the COVID-19 pandemic.

3.2.9 The survey will be revised to take into consideration the changes in ICT in education brought about by the adoption of online teaching and learning prompted by the pandemic.

3.2.10 Data collection for the Survey of S&T Indicators, 2020 was put on hold during the national COVID-19 lockdown. The deadline date was extended to 31 August 2020.

3.2.11 Due to restrictions on field work data collection in the research institutions, higher education and government sectors continued in-house through emails/telephone.

3.2.12 Data collection in the business sector was discontinued for this survey year mainly because of the difficulty experienced from collecting data from the business sector online and the deadline date.

3.2.13 The survey was completed in the research institutions, higher education and government sectors.

3.2.14 A proposal has been developed and will be submitted under the PSIP programme to assess the impact of COVID-19 on the education system. Additionally, an assessment of the readiness, of the National Education system, to pivot under the new normal will be undertaken

## Operational Environment: Human Resources, Financing and Infrastructure

3.2.15 **NIHERST has experienced a significant decline in funding.**

3.2.16 Loss of quality staff has had a negative impact on NIHERST's ability to support research and planning for the MOE and other government Ministries. At the time of the public hearing, a Cabinet note to appoint the NIHERST Board of Governors was with the Ministry of Finance.[4]

3.2.17 There are currently 102 people employed by NIHERST, the majority of whom are employed on a contractual basis. There are 54 permanent staff approved under NIHERST's establishment and 24 vacant posts. Please see the organisational chart provided by NIHERST to the Committee at **Appendix IV.**

[4] The Committee subsequently learnt that NIHERST appointed a board on Friday 18th June, 2021

3.2.18 Some of the key challenges identified by NIHERST are as follows:

i. Inadequacy of financial resources;
ii. Inappropriate infrastructure;
iii. Inadequacy of human resources with regard to skills, competencies and number of staff;
iv. Legacy HR issues;
v. Legacy IT systems that limit ability to configure data to satisfy present day needs.

3.2.19 In 2013 NIHERST engaged the services of a consultant to conduct an Organization Transformation Study towards restructuring of the institute. The objectives of the study were:

i. To improve the operational efficiency and effectiveness of NIHERST to position the institute as a world class STI institute;
ii. To restructure NIHERST to facilitate successful implementation of the strategic plan; and
iii. To attract and retain a high calibre of staff.

3.2.20 The project was interrupted pending approval of the recognized union which was secured in 2015. Further delays ensued in the absence of a Board of Governors from September 2015 to July 2017 and the expiration of the Strategic Plan during said period. Subsequent to the appointment of the Board on July 27 2017, management was asked to hold on the implementation of the restructuring exercise pending the completion of a Strategic Plan for the ensuing period.

3.2.21 The final report dated May 12, 2017, outlined the following human resource challenges affecting the successful implementation of the institutes Strategic Plan, the majority of which remains relevant to date.

1. Obsolescence of positions on the establishment;

2. Changes in business priorities over the years;
3. Large complement of contract staff;
4. Legislative restrictions (recruitment);
5. Unattractive remuneration;
6. Difficulty with respect to attraction and retention of senior personnel;
7. Absence of career pathing and succession planning.

3.2.22 A Strategic Plan for the period 2020-2022 was approved by the Board in July 2020. Thereafter, **Board approval was secured for the Revised Organizational Structure for executive level management with associated functions**. The term of office of the Board of Governors ended effective July 2020.

3.2.23 The expected benefits to be derived from a restructured NIHERST include:

1. Creation of core positions to adequately support the strategic focus and changing needs of the institute that operates in a complex, dynamic and changing environment;
2. Streamlined positions to provide for specialists;
3. Established career paths that allow for lateral and upward career progression
4. Enhanced compensation packages to attract core talent
5. Increased operational efficiency to allow NIHERST to fully deliver on the institute's mandate.

## Special Projects, Products and Services

3.2.24 NIHERST provided the Committee with a list of services and products and special projects and collaborative relationships geared towards STI popularisation. The information has been summarised in Table 7 below. The majority of the items listed are active.

**TABLE 7 STATUS OF MAJOR NIHERST PROJECTS, PRODUCTS AND SERVICES**

| Active | Inactive | Closed/completed |
|---|---|---|
| National Science Centre Visitor Programme | Caribbean Youth Science Forum (CYSF) | Electricity and Electronics workshops |
| Robotics & Creativity Design Workshop | Robotics club | SciEng Club |
| FAB Lab | | Tech Club |
| Vacation Camps | | Community-Centred Design and Innovation for Secondary School students |
| iSTEM clubs | | Establishment of a National Science Centre - Science City (2017) |
| Outreach through events staged by external public and private agencies | | Improving Innovation Capacities in the Caribbean (INOVAC) Project (2017) |
| Astronomy Programme | | E-Scientia Exhibit (2016) |
| Educational Resource Materials | | Youth Build – design-based solutions to community problems (2017) |
| Bi-regional partnership in Science, Technology and Innovation with European Union, Latin America and Caribbean | | Made in the Caribbean camps – building capacity in Technopreneurship (2016) |
| Research grant and fellowship opportunities | | |
| NASA International Internship | | |
| Seismology in Schools (SIS) programme – hands-on seismological activities | | |
| National Youth Science Camp, West Virginia, USA | | |
| FIRST LEGO LEAGUE (FLL) – Robotic missions and student research project on human/animal interactions | | |

## Income and Expenditure

3.2.25 NIHERST earned a total of **$2,959,330.00** in the period 2017 to 2020 from **non-government** sources of income. Please see the breakdown of these income sources in Table 8 below.

TABLE 8 NIHERST'S NON-GOVERNMENT REVENUE 2017-2020

| | NIHERST: OTHER INCOME 2017-2020 | | | | | |
|---|---|---|---|---|---|---|
| | **Description** | **2017** | **2018** | **2019** | **2020** | **Total** |
| | Interest Income | 5,611 | 4,636 | 5,651 | 8,613 | **24,511** |
| | National Science Centre | 892,241 | 734,229 | 834,040 | 159,174 | **2,619,685** |
| | Caribbean Youth Science Forum | 50,827 | 0 | 0 | 0 | **50,827** |
| | Shell | 0 | 0 | 112,533 | 106,415 | **218,948** |
| | BHP | 0 | 0 | 45,359 | 0 | **45,359** |
| | **Total** | **948,679** | **738,865** | **997,583** | **274,202** | **2,959,330** |
| | | | | | | |
| | **Notes** | | | | | |
| 1 | Shell contract is for $12.7 Million to be executed over the period June 2019 to June 2022 | | | | | |
| 2 | BHP contract was valued at $104,000 and executed in 2019 | | | | | |
| 3 | Income from National Science Centre declined in 2020, due to closure as a result of the current pandemic | | | | | |

3.2.26 For the period 2017-2020, NIHERST received a total allocation of $112,798,184 for recurrent expenditure in the areas of Personnel, Goods and Services and Current Transfers and subsidies. The total released was $79,301,312. Expenditure for the period totalled $86,476,391. Tables 9 and 10 below provide a breakdown of these figures for the period.

## TABLE 9 RECURRENT ALLOCATED AND ACTUAL EXPENDITURE 2017-2020

**NIHERST**

**RECURRENT ALLOCATED AND ACTUAL EXPENDITURE 2017-2020**

| Description | FY2017 | | FY2018 | | FY2019 | | FY2020 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Allocated | Actual | Allocated | Actual | Allocated | Actual | Allocated | Actual | Allocated | Actual |
| Personnel Expenditure | 7,371,400 | 5,787,918 | 7,371,400 | 6,337,449 | 7,802,400 | 6,538,891 | 7,802,400 | 6,164,448 | 30,347,600 | 24,828,706 |
| Goods and Services | 22,963,600 | 18,071,164 | 20,108,600 | 13,530,007 | 19,073,200 | 11,006,614 | 13,280,184 | 12,884,599 | 75,425,584 | 55,492,384 |
| Minor Equipment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Current Transfers and Subsidies | 1,775,000 | 1,680,189 | 1,550,000 | 1,457,298 | 1,850,000 | 1,420,055 | 1,850,000 | 1,597,759 | 7,025,000 | 6,155,301 |
| **Total** | **32,110,000** | **25,539,271** | **29,030,000** | **21,324,754** | **28,725,600** | **18,965,559** | **22,932,584** | **20,646,806** | **112,798,184** | **86,476,391** |

**Note: Allocated represents amounts stated in the national budget for the year**

## TABLE 10 RECURRENT RELEASES AND ACTUAL EXPENDITURE 2017-2020

**NIHERST**

**RECURRENT RELEASES AND ACTUAL EXPENDITURE 2017-2020**

| Description | FY2017 | | FY2018 | | FY2019 | | FY2020 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Releases | Actual | Releases | Actual | Releases | Actual | Releases | Actual | Releases | Actual |
| Personnel Expenditure | 5,567,300 | 5,787,918 | 6,490,222 | 6,337,449 | 6,219,101 | 6,538,891 | 7,318,583 | 6,164,448 | 25,595,206 | 24,828,706 |
| Goods and Services | 18,210,335 | 18,071,164 | 12,908,465 | 13,530,007 | 6,404,052 | 11,006,614 | 10,246,759 | 12,884,599 | 47,769,611 | 55,492,384 |
| Minor Equipment | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Current Transfers and Subsidies | 1,235,500 | 1,680,189 | 1,550,000 | 1,457,298 | 1,317,530 | 1,420,055 | 1,833,465 | 1,597,759 | 5,936,495 | 6,155,301 |
| **Total** | **25,013,135** | **25,539,271** | **20,948,687** | **21,324,754** | **13,940,683** | **18,965,559** | **19,398,807** | **20,646,806** | **79,301,312** | **86,476,391** |

**Note**

Released represents amounts received by the NIHERST

## National Science Centre

3.2.27 With regard to the National Science Centre, allocations, releases and expenditure have been captured in Tables 11 and 12 below. It is important to note that expenditure is related to legal fees.

TABLE 11 NATIONAL SCIENCE CENTRE ALLOCATIONS AND RELEASES 2017-2018

| | Allocated | Released |
|---|---|---|
| 2017 | $12,000,000.00 | $3,103,800.00 |
| 2018 | $1,000,000.00 | $999,940.00 |

TABLE 12 LEGAL FEES INCURRED IN RELATION TO THE NATIONAL SCIENCE CENTRE

| *Legal firms retained and fees incurred* | |
|---|---|
| *Legal Services Provider* | *Payments TT$* |
| JD Sellier & Company Limited (Dec. 2013 – Oct 2014) | $719,100 |
| Fitzwilliam Stone Furness-Smith and Morgan (Feb. 2015 – April 2016) | $259,987 |
| JD Sellier & Company Limited (Sept. 2017- Oct. 2019) | $149,675 |
| Fitzwilliam Stone Furness-Smith and Morgan (Nov. 2019 –March 2020) | $112,262 |
| **Total Legal fees for project to date** | **$1,241,024** |

3.2.28 NIHERST currently functions with its Head Office located at #13 Education Towers, #5 St. Vincent Street, Port of Spain and The National Science Centre (NSC) located at Corner Piarco Old Road and Churchill Roosevelt Highway, D'Abadie.

3.2.29 The National Science Centre currently operates at a monthly lease of $286,053.76.

3.2.30 The National Science Centre (NSC) houses all exhibits and shares the experience with visiting schools at a national level and is faced with many infrastructural and environmental issues that can negatively impact its sustainability. NSC is

located in near proximity to the Maloney Wastewater Treatment Plant (WTP) from which consistent emissions result in a pungent odour into the Science Centre facility. Other infrastructural challenges include:

1. Sewage overflows on the compound;
2. Snakes, rodents and other pests entering the building;
3. Leaks and cracks in the ceiling

3.2.31 Within recent years, the following is a list of properties that were assessed and considered for the relocation of the integrated NIHERST:

1. UTT Agora Campus – inadequate size;
2. UTT Valsayn Campus – inadequate size;
3. UTT O'Meara Campus – adequate size but reassigned;
4. Private facilities at Charllieville and Chaguanas – commercial concerns
5. Tamana InTech Park (new build)

3.2.32 In October 2020, NIHERST pursued the acquisition of UTT Campus in O'Meara as a new home that housed both Head Office and NSC. The UTT Campus offered at total of 145,720 ft² that would sufficiently cover current operations and take into consideration any future expansions that may occur.

3.2.33 At the 117th Meeting of the NIHERST Board of Governors (BoG), held on 11th October 2017, the BoG instructed **that all the Science City project contracts were to be terminated.** Legal opinions were sought from JD Sellier & Company Limited on the termination of the open contracts.

3.2.34 At the 127th Meeting of the NIHERST BoG, held on the 26th September 2018, the BoG instructed the Procurement Committee to proceed to acquire the Terms of Reference for the engagement of an independent auditor. An independent auditor was selected as the preferred service provider to conduct the audit and

review outstanding payments due to consultants in the amount of TT$ 3,347,713.20. Progress of the audit was halted with the ending of the BoG term in July 2020. Management continues to discuss matters with ACLA Works related to their outstanding invoices.

## Findings and Recommendations

Based on the evidence outlined in this section, the Committee concluded the following:

i. It was not surprising that Covid-19 had a negative impact on NIHERST being able to implement policies to impact on Science Technology and Innovation.

ii. NIHERST's promotion strategy has a limited impact on the advancement of STEM-related policy and industry.

iii. It appears that NIHERST exists in isolation from other related government ministries and is therefore unable to have the level of influence required to make a significant impact on the STEM sector.

iv. A high level of dependence on State Funding as the primary source of income inhibits NIHERST's ability to fund its initiatives.

v. The current organisational structure needs to be revised for the current climate.

vi. NIHERST has the potential to generate income via offering consulting, technical and research services at both the regional and international level.

vii. Lack of protection of NIHERST's Intellectual property creates room for the work of the Institute to be co-opted by external parties.

viii. The Committee expressed concern about the significant delays in the completion of the restructuring exercise identified at 3.2.1.

ix. The lack of brand visibility is detrimental to the advancement of NIHERST's work.

## Recommendations

Based on the evidence and information received by the Committee, we respectfully recommend the following:

i. **NIHERST should improve its communications, promotions and marketing strategy geared towards improving its public engagement based on an assessment of the gaps in its current strategy.**

ii. **As part of its response to this report, NIHERST should provide the Committee with a revised plan for income generation in light of Covid-19 restrictions.**

iii. **Based on its success in producing vital research on science and technology, NIHERST could consider offering its services as paid STEM consultants to regional and international governments desirous of developing the STEM sector in their respective jurisdictions.**

iv. **NIHERST should consult with the Intellectual Property Office to secure patents and other legal protections for its Intellectual Property.**

v. **As part of its response, NIHERST should provide the committee with an update on:**
   1. **Its Human Resources needs and filling of vacancies; and**
   2. **Efforts to new obtain new location to house its Head Office and NSC.**

vi. **As part of its response, NIHERST should provide a status update on the process of acquiring the UTT Campus in O'Meara.**

## Objective 3: To examine the extent to which NIHERST has influenced the development of tertiary education and training in STEM.

### Consultations, Engagement and Outreach

3.3.1 The MOE indicated that it will seek to increase consultations with tertiary institutions to align STEM programmes with the skills required in the labour force. NIHERST works with students enrolled in the formal educational system. It also engages in community outreach to engage youth outside of the formal school system.

3.3.2 NIHERST plans to reach out to the Ministry of Youth Development and National Service to engage youth in under-served communities. NIHERST collaborates with the University of Trinidad and Tobago (UTT) in an informal manner, however, an MOU was drafted to address further collaboration and corporation. NIHERST has not collaborated with the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT).

### NIHERST's Contributions to Post-Secondary STEM Development

3.3.3 Upon the establishment of the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT) in 2000, the Accreditation Council of Trinidad and Tobago (ACTT) in 2004, and the University of Trinidad and Tobago (UTT) in 2004, **the NIHERST's role and function were diminished**.

3.3.4 The NIHERST is not directly engaged with tertiary and post-secondary institutions in the development of STEM academic programmes and curricula. The Institute offers a number of activities in which students in post-secondary and tertiary institutions are involved such as the NASA International Internship Programme, Other initiatives include the Caribbean Youth Science Forum and the Fab-Lab at the National Science Centre.

3.3.5 Under the NASA International Internship Programme **14 Interns participated during the period 2014-2021**. Professors from the three universities in Trinidad and Tobago assist in promoting the programme to their students so that students from the three universities are given the opportunity to apply. The professors are also involved in judging the applicants. These participants benefitted from increased knowledge gains in research methodologies in novel areas of STEM.

3.3.6 NIHERST's partnership with the International Centre for Genetic Engineering and Biotechnology (ICGEB) strengthens the research capability of its members through training, internship and funding programmes and advisory services to member states. NIHERST is the liaison office for ICGEB in Trinidad and Tobago. Past benefits to Trinidad & Tobago included:

1. Grant funding - projects include "Genetic contributors to Diabetes Mellitus in Indo-Trinidadians"
2. Funding for hosting of meetings and/or courses in T&T and participation at ICGEB events
3. Awarding of post-doctoral fellowships
4. Collaborations, including hosting of a biosafety workshop
5. Technology transfer agreements with laboratories

3.3.7 A workshop on 3D printing was conducted with students of UTT's Biomedical Engineering Program to provide the students with practical experience in the area of 3D printing.

3.3.8 The MOE indicated that there is a focus on primary, rather than tertiary development of STEM, as there is a growing recognition that early involvement in STEM provides young children, particularly from low-income, with a good start in life.

3.3.9 The MOE also stated that it is important that early STEM education is age and stage appropriate and that the inclusion of play and the manipulation of materials to develop STEM thinking are a foundational in the development of learners' STEM education experiences.

3.3.10 In 2018 – 2019, NIHERST partnered with Dr. Judith F. Gobin, Senior Lecturer, Department of Life Sciences, UWI, St. Augustine, on the Deep Seas Wonders of the Caribbean project. This initiative shared her knowledge of the deep-sea environment in the region, fostering an understanding and appreciation through the introduction and distribution of an educational video series and captioned photo book detailing this previously unexplored natural feature.

3.3.11 The Fab Lab, over the years has worked with both students and lecturers within the Tertiary sector. Some of the projects worked on include:

1. The creation of a 3D printed arm for a final year student who required 3D printing services;
2. The incorporation of 3D printing in costume design by a final year student who 3D printed textures onto a netted material as part of her final project;
3. Collaborating with UWI professor Dr. Cathy Radix in the programming of the Baxter Robotics System, which would have then been used by Dr. Radix to train her students in practical labs. Unfortunately, this initiative experienced setbacks due to low enrolment and Covid 19;
4. Attend Outreach events held by Tertiary Institutions to showcase the available services at the Fab Lab;
5. Recruitment of University students for the Summer Camp program, where they will be exposed to the equipment at the Fab Lab and NIHERST's method of informal teaching. This knowledge would then be displayed in the camps as the students take lead in camp activities; and

6. Collaborated with UWI to host the traveling exhibition, Energiewende, which highlighted Germany's transition into renewable energy at the UWI, St. Augustine Campus.

3.3.12 The Fab Lab is currently working on meeting the requirements to transition into a Fab Academy Node where NIHERST can provide formal training to students and the wider public in the area of Digital Fabrication.

## Gaps in Trinidad and Tobago's STEM Readiness

3.3.13 Primary research involving consultations among key focus groups has identified the following gaps in Trinidad and Tobago's development of a robust STEM education programme:

1. The separation of Mathematics and Science at the ECCE level;
2. There is inadequate infrastructure to support practical training in STEM at the Primary and Secondary level;
3. TVET, being perceived as "second chance" or "second rate" education and are associated with "academic underachievers". This is a concern as Engineering courses at the Secondary level are classified under TVET; and
4. There is a mismatch of skills acquired from the tertiary learning in Trinidad and Tobago and those needed by industry.

3.3.14 The quality of primary and secondary education fails to provide students with updated knowledge and skills that meet international academic standards. Evidence from the **2009 Program for International Student Assessment (PISA) and the 2011 Progress in International Reading Literacy Study (PIRLS) (2011) suggests that the curriculum did not develop student's skills and competencies in ICT, critical thinking, and problem solving**

3.3.15 Teacher preparation programmes tend to focus on the theory of teaching and trainees are not given sufficient hands-on exposure in the classroom.

3.3.16 For higher education students, there is a visible gap between the knowledge and skills they are imparted and those actually demanded by employers in the labour market. Higher education is not adequately aligned with the demands of employing firms in the labour market

3.3.17 There is Brain Drain among graduates because of the lack of opportunities locally.

3.3.18 There is a risk adverse culture with the fear of failure and cost to developing businesses.

3.3.19 Inadequate investment in Research and Development.

## Building Trinidad and Tobago's STEM Capacity

3.3.20 NIHERST has deduced that the following steps need to be taken in order to build Trinidad and Tobago's capacity in the area of STEM:

a. Implement an S&T **policy**
b. Development of a national STEM **Strategy**
c. Allocation of **funding** for STEM.
d. Increase an **investment** in Research and Development.
e. Developing an **Inter-Ministerial Committee** on Science, Technology and Innovation chaired by the Prime Minister.
f. Development of national STEM **standards and a national measure** for 21st century skills (National Learning and Innovation Index)
g. **Develop and expand** NIHERST STEM education products and services to address public pains/national issues and showcase the importance of science in line with global trends

h. **Develop and expand** STEM education programmes to incorporate learning and innovation skills
i. **Engagement** of the formal education sector via mandatory participation in enriching, inquiry-based informal STEM education through the NSC
j. **Partner** with key stakeholders in STEM education to integrate 21st century skills (learning and innovation) into local and CXC curricula and explore examination reform
k. **Development and facilitate** training programmes for teachers to incorporate 21st century skills teaching methods/strategies in the classroom
l. **Partner with key stakeholders** (Ministry of Planning and Development, NTA, CSO, Ministry of Labour, tertiary education stakeholders) in labour industry to identify and address STEM labour needs for Trinidad and Tobago. Conduct National Skills Gap Analysis Studies in Emerging Sectors of the Economy.
m. **Brain Gain –** tap into the resources of STEM professionals within the diaspora.

3.3.21 When asked by the about NIHERTS's efficacy and relevance in the development of Trinidad and Tobago's goals and objectives, the Ministry of Education stated that in light of the statement from Trinidad and Tobago's National Development Strategy that " there is insufficient research centres and systems in place for graduates to continue working within the sector and keep up with the rapid advances in technology," NIHERST must play a role in conducting the necessary research to ensure that the country keeps abreast of the changes in science and technology. The Ministry further stated that its role cannot be limited to the popularisation of science and technology among primary and secondary students.

## Findings and Recommendations

Based on the evidence outlined in this section, the Committee concluded the following:

i. Though the mandate of NIHERST does not require collaboration with tertiary

institutions, there is a need for this collaboration to take place in order for NIHERST to have an impact on developing the STEM sector.

ii. The initiatives in developing STEM academic programmes and curricula at the tertiary and post-secondary level have had a positive impact on a select group of individuals. However, the wider impact on the general tertiary system has been negligible.

iii. The surveys conducted by NIHERST provide valuable information. These findings need to be used to develop tertiary curricula and should also be used to inform priorities for Government-funded scholarships and bursaries.

iv. There is not enough collaboration between the MOE and NIHERST in developing STEM in education.

v. NIHERST cited lack of opportunities in STEM as part of the push factors with regard to the Brain Drain. NIHERST should play a greater role in creating these opportunities locally.

vi. The Committee expressed interest in the Ministry of Education's policy response to NIHERT's findings in their study on the gaps in Trinidad and Tobago's STEM readiness.

vii. The Committee was uncertain whether any tangible action was taken by the Education authorities based on NIHERT's findings at 3.3.17.

viii. The Committee endorses NIHERT's recommendations at 3.3.23

## Recommendations

Based on the evidence and information received by the Committee, we respectfully recommend the following:

i. **NIHERST and the Ministry of Education should develop a collaborative relationship to assess the current Bursaries and Scholarships offered by the MOE to determine whether there is sufficient emphasis given to the areas needed to propel the STEM sector in Trinidad and Tobago.**

ii. **Tertiary Institutions should collaborate with NIHERST and STEM-related Businesses to develop a STEM audit to assess the gaps between STEM education at the tertiary level and employability of graduates.**

iii. **Tertiary institutions should collaborate with NIHERST, the public and private sector to expand STEM-based internships available to students to improve employment opportunities for graduates.**

iv. **NIHERST should collaborate with the MOE and the Ministry of Youth Development and National Service and tertiary institutions to develop targeted STEM-based career guidance and mentorship programmes for students. These programmes could feature individuals who have been able to succeed locally in STEM-based careers.**

The Committee respectfully submits the foregoing for the consideration of the Parliament.

Dr. Varma Deyalsingh
Chairman

Mr. Esmond Forde, MP
Vice-Chairman

Mrs. Lisa Morris-Julien, MP
Member

Mrs. Ayanna Webster-Roy, MP
Member

Mr. Nigel De Freitas
Member

Ms. Khadijah Ameen
Member

Mrs. Renuka Sagramsingh-Sooklal
Member

Ms. Jayanti Lutchmedial
Member

**Dated December 16, 2021**

# Appendices

# Appendix I

# NIHERST'S Key Initiatives 2010-2020

## Research and intelligence gathering to shape science policy and guide the funding of research and development (R&D)

Build capacity and capability: Established a Policy Research and Intelligence Unit in October 2012

Policy development: Coordinated six (6) stakeholder consultations in the development and drafting of a national science and technology (S&T) policy. The Policy included the establishment of a national S&T fund.

Make available to key national institutions subject matter expertise for technical and analytical support as well as peer reviews.

Leverage in-house capability in economics to undertake ○ Science Technology and Innovation (STI) studies and surveys in support of Economic Diversification (refer questions 2 and 3)

Sectoral Innovation Mapping (SIM) Studies Targeting Priority Sectors in Trinidad and Tobago

## Promoting innovation and commercialisation of technology in priority areas

Promoted competition in technological innovation as a pull factor – through PSIP funded Prime Minister's Awards for Innovation and Invention re-launched as Prime Minister's Awards for Scientific Ingenuity. The award scheme has two categories of competition, both open to Seniors (18 and over) and Juniors (13-17). The Scientific Innovation and Invention Competition is open to entrants with prototypes that have the potential to be successfully commercialised. The Scientific Creative Solutions Competition judges the contributions by individuals who can conceptualise solutions to everyday problems in any domain, but who are unable to take their ideas to the prototype stage. The top winners offered prototypes and solutions in:

- A novel biosensor for detection of Thyroid disorders
- Fate of Biocides in Produced Water
- Portable Solar Powered AC Unit
- Trini Taxi App
- Constant voltage high lithium battery Multi-Que Barbeque Grill
- Arched Gate Guiding & Track System

Build technological know-how for sustainability -Developed project proposals and attained funding to train members of communities to build technologically-improved rainwater harvesters (RWHs), the science behind rainwater harvesting and maintenance procedures. NIHERST partnered with Phoenix Park Gas Processors Limited, to introduce the concept of rainwater harvesting in three new schools in Trinidad. Members in each of the 21 communities were also trained to commercialise this new service in and beyond their communities. Residents in the communities benefitted from trained personnel installing improved quality RWHs.

The establishment of a digital fabrication laboratory (Fab Lab). NIHERST's Fab Lab is the first of its kind registered in Trinidad and Tobago, and in the region, by the Fab Foundation which emerged from the Massachusetts Institute of Technology (MIT) Center for Bits & Atoms Fab Lab Program. Our lab focuses on design, hands-on projects, robotics, product development and prototyping.

## Building collaborative global relationships

Identified and networked with institutions for collaborative partnerships.

Established and maintained linkages with specialised regional and international research, science and technology institutions through agreements e.g.,

- National Institute of Science Technology & Development Studies, India (NISTADS) - International Conference on Science and Technology for Economic Diversification (INSCITED)
- National Council of Science Museums, India (NCSM) - travelling exhibition, India, A Culture of Science
- Icehouse, New Zealand - Foresighting
- National Aeronautics and Space Administration, USA (NASA) - International Internship Programme for Tertiary Students
- Institute of Electrical and Electronics Engineers (IEEE) - E-Scientia Exhibit
- International Centre for Genetic Engineering and Biotechnology (ICGEB) - grant and fellowship funding
- Scientific Research Council, Jamaica (SRC) - Improving Innovation Capacities in the Caribbean (INVOCAB).

### Fostering a culture of science, innovation and entrepreneurship

• Recognition and rewards of excellence in 6 STI categories:

- The Rudranath Capildeo Award for Applied Science & Technology
- The Emmanuel Ciprian Amoroso Award for Medical Sciences
- The Julien Kenny Award for Natural Sciences
- The Fenrick De Four Award for Engineering
- The Anthony Williams Award for Technological Innovation in Arts and Culture
- The Frank Rampersad Award for Junior Scientist
- The Ranjit Kumar Award for Junior Engineer

Rebranding of STI Popularisation Programme to include:

- STEM camps and clubs providing academic support to the students in problematic STEM topics they encounter in the classroom while engaging camp and club members in 21st century learning.
- Outreach events and exhibitions, making global and local developments in STEM more understandable to students and community residents.
- School-based STEM education interventions, increasing students' exposure to inquiry-based STEM education through use of practical activities.
- Competitions encouraging youth to creatively engage with STEM

Provided the population with affordable access to digital fabrication equipment and resources for creativity and innovation. NIHERST's Fab Lab was launched in 2015, the first of its kind registered in Trinidad and Tobago, and in the region.

Facilitated and funded internships and scholarships to national secondary and tertiary level students. Participants benefitted from the interaction and collaboration among foreign students, with the view to enhancing students' knowledge of STEM, developing skills in novel areas of research, developing leadership abilities, fostering cross-cultural understanding, and enabling future multinational missions and collaborations in STEM.

Documented, published and distributed nationally and regionally, publications which highlighted Trinidad and Tobago's scientific, technological and innovative ICONs.

# Appendix II

# NIHERST's Key Achievements: 2015-2020

Appointment of Executive leadership
2. Completion of a 2020-2022 strategic plan
3. The expansion of Fab Lab services to advance entrepreneurship and innovation. a. IP clinic
b. Artisan Workshops
c. Meet the Entrepreneur Series

4. Initiate new research agenda with a. Sector Innovation Mapping Studies

5. Completed an HR Operational Efficiency Review
6. Completed consultancy on Organisation Transformation Study... The Restructuring of NIHERST
7. Board approval of top tier structure and functional areas
8. Promote STEM Collaboration a. Purchase Contract with Shell Trinidad for 15 million over 3 years
b. Women and Girls in Science with UNESCO
c. Virtual Science Fair with Soroptomist International Newton

- 9. Completion of STI and STEM Education Surveys • Annual Survey of S&T Indicators 2015 – 2020
- • Survey of Mathematics in Secondary Schools, 2016
- • Survey of Mathematics in Primary Schools, 2017
-

- 10. Contribution to Government's Roadmap to Recovery Committee (**Click for Access**)
- 11. Over 90% of Management trained in Results-Based Monitoring and Evaluation resulting in the integration of this new approach into the institute programmes and projects
- 12. Expansion of NSC's STI Popularization programmes to make 21st century learning and innovation skills the focal point of content delivery

13. Rebranding of Science Club to iSTEM Club, resulting in increased membership by 41% in 2018. In the 2018/2019 academic year, parents agreed that their child/children demonstrated improvement in all learning and innovation skills as a result of participating in iSTEM Club: oral and written communication (74.6%), teamwork and collaboration (86.1%), problem solving (85.2%), critical thinking (84.4%), creativity and innovation (91.8%). 100% of parents were satisfied with the content delivered and would recommend the offering to other parents.

14. Augmented the community science week with a NSC Science week to increase STEM engagement of the general public.

15. Professional Development
NIHERST attained approval of the 9th European Development Fund (EDF) in the amount of TT$1,402.583, in August 2020, for professional development training to advance the Fab Lab to Fab Academy status.

16. Provision of STEM Services

NIHERST partnered with Shell Trinidad and Tobago Limited: to strengthen the energy sector's talent pipeline and the country's effort at economic diversification by enhancing critical thinking,

creativity and problem solving through strengthening awareness, competence and delivery of STEM within the educational system. A $15 million contract was signed in 2019 for programme and project execution over a 3-year period. NIHERST has become the partner of choice to execute STEM initiatives.

17. NASA $I^2$ International Internship Programme

NIHERST was the first International organization to participate in NASA's International Internship. Following the signing of an agreement between NIHERST and NASA in 2012, the NASA $I_2$ programme facilitates a structured educational exchange among students from Trinidad and Tobago and U.S. interns, under the mentorship of a member of NASA's science and engineering workforce. The programme has had continued success, every year since the launch in 2014. NIHERST has supported a total of fourteen (14) interns to date. The small, but impactful alumni, are all currently pursuing higher education, in the field of Science, technology, Engineering and Mathematics (STEM).

18. Rainwater Harvesting Project

NIHERST's rainwater harvesting project seeks to develop sustainable solutions to societal pain points by leveraging innovative technologies. Members of communities learn to build technologically-improved rainwater harvesters, the science behind RWH, maintenance procedures and entrepreneurship. To date, eighteen (18) schools and four (4) community centres across Trinidad have been equipped with RWHS installed by NIHERST.

This project improved the social and economic dimensions associated with potable water in water scarce communities. Trainees advanced their businesses and will utilise this RWH model, one in the use of rainwater for her ice production business, a second in opening of an elderly home in their community and other in her pastry making business.

In 2021, the Green Fund proposes to fund 15 additional systems; 13 in Trinidad and 2 in Tobago over a 3-year period.

19. Completed of two 2 Sectoral Innovation Mapping Studies (SIMs): Animation and Energy Services as platforms for stimulating economic growth in light of the current economic downturn in Trinidad and Tobago. Innovation is the linchpin of sustainable economic growth for countries transitioning from middle-income to first world status.

20. International Conference on Science and Technology for Economic Diversification (INSCITED). First local science conference, planned and organised by NIHERST

# Appendix III

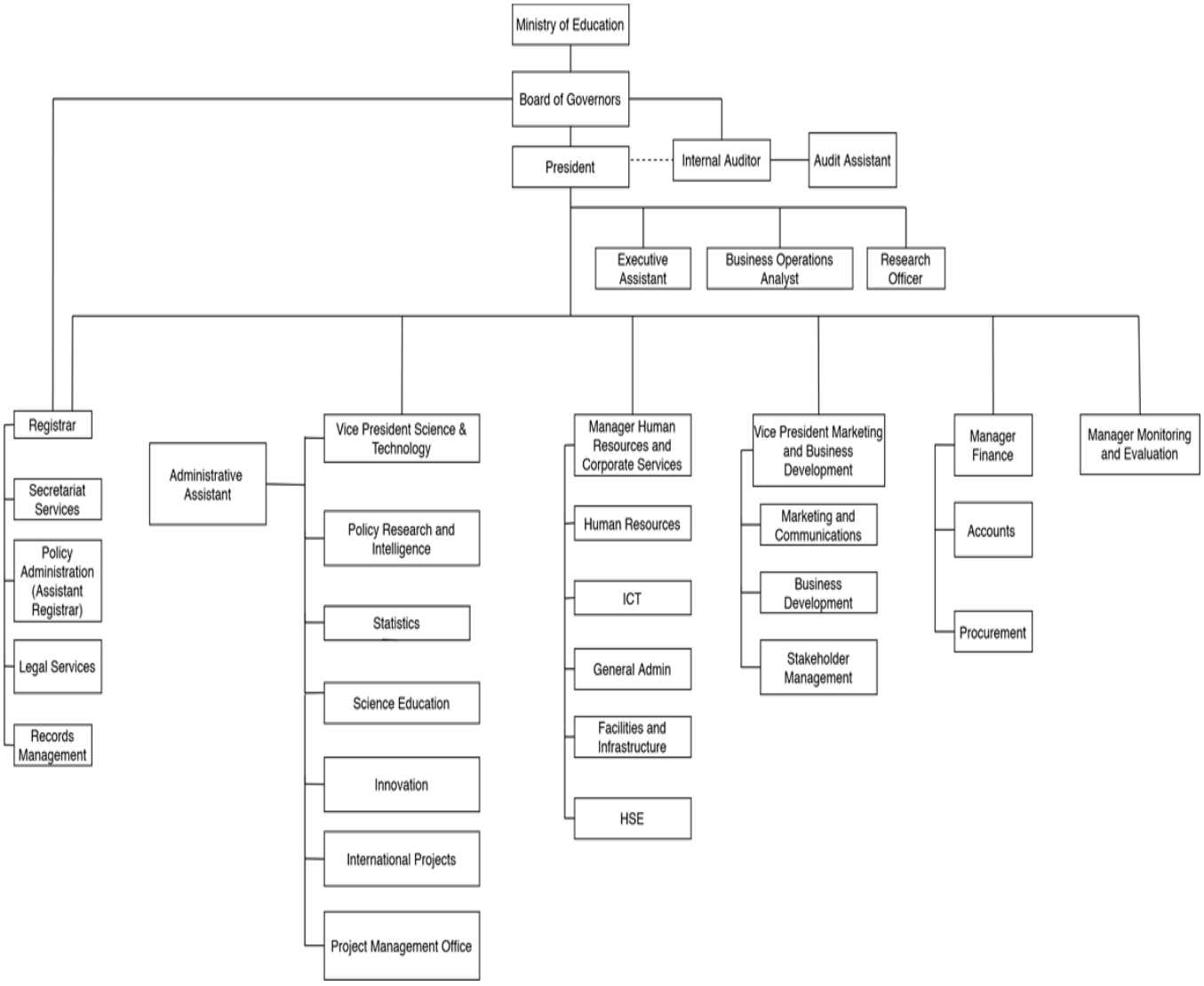
# SWOT ANALYSIS OF NIHERST

| Strengths: | Weaknesses: |
|---|---|
| 1. Board of Governors appointed by the Government to support corporate governance<br>2. Significant Networking capabilities<br>3. Highly committed staff<br>4. Subject matter experts in key areas of Science, Technology and Innovation<br>5. A relevant portfolio of STI and Science, Technology, Engineering and Mathematics (STEM) programmes and projects<br>6. Leaders in STI Indicators and STI Popularisation in the English-speaking Caribbean<br>7. Recognised as a valued partner in policy formulation re STI and Economic Diversification (Sectoral Innovation Mapping [SIM]; Innovation Policy among others)<br>8. Recognised as an important partner in STI programmes and projects<br>9. Strong brand recognition for national and regional outreach events (Sci-TechKnoFest, Astronomy Nights, NASA, NYSF, FLL, Camps, CYSF, Science Weeks)<br>10. Only National Science Centre in the English-speaking Caribbean<br>11. Collection of relevant STI Exhibits<br>12. A solid foundation re: Stakeholder and Community engagement on which to build<br>13. Unique mode of delivery of STI info – Hands-on, Minds-on (inquiry-based, experiential, interactive learning)<br>14. Goodwill and level of credibility on which to build<br>15. Long history in the national delivery of Science and Technology<br>16. First mover advantage in the promotion and delivery of STEM | 1. Dated establishment (unchanged since 1984)<br>2. Delay in the appointment of a Board of Governors<br>3. Staff vacancies in key functional areas<br>4. Insufficient buy-in from internal stakeholders<br>5. Limited brand visibility and reach<br>6. Unsafe/Unsuitable infrastructure at NSC<br>7. Resource constraints in ICT/IS Systems which limits ability to manipulate relevant data<br>8. Continued use of legacy/ICT/IS to access stems<br>9. Principally driven by State funding<br>10. Insufficient contemporary skills and knowledge to achieve mandate<br>11. Lack of protection of NIHERST Intellectual Property |
| Opportunities: | Threats: |
| 1. Leverage use of ICT across institute<br>2. Same<br>3. To strengthen our position as the national agency for STI and STEM Education for the Fourth Industrial Revolution and beyond<br>4. Mobilise new technologies such as Robotics and Artificial Intelligence in the provision of new services<br>5. Build brand visibility through virtualisation*<br>6. Blended Offerings | 1. Change in Government's focus/mandate<br>2. Economic changes/ down-turn – fall in the price of oil<br>3. Pandemic - possibility of total shut-down due to further waves of the virus<br>4. Competition for State resources |

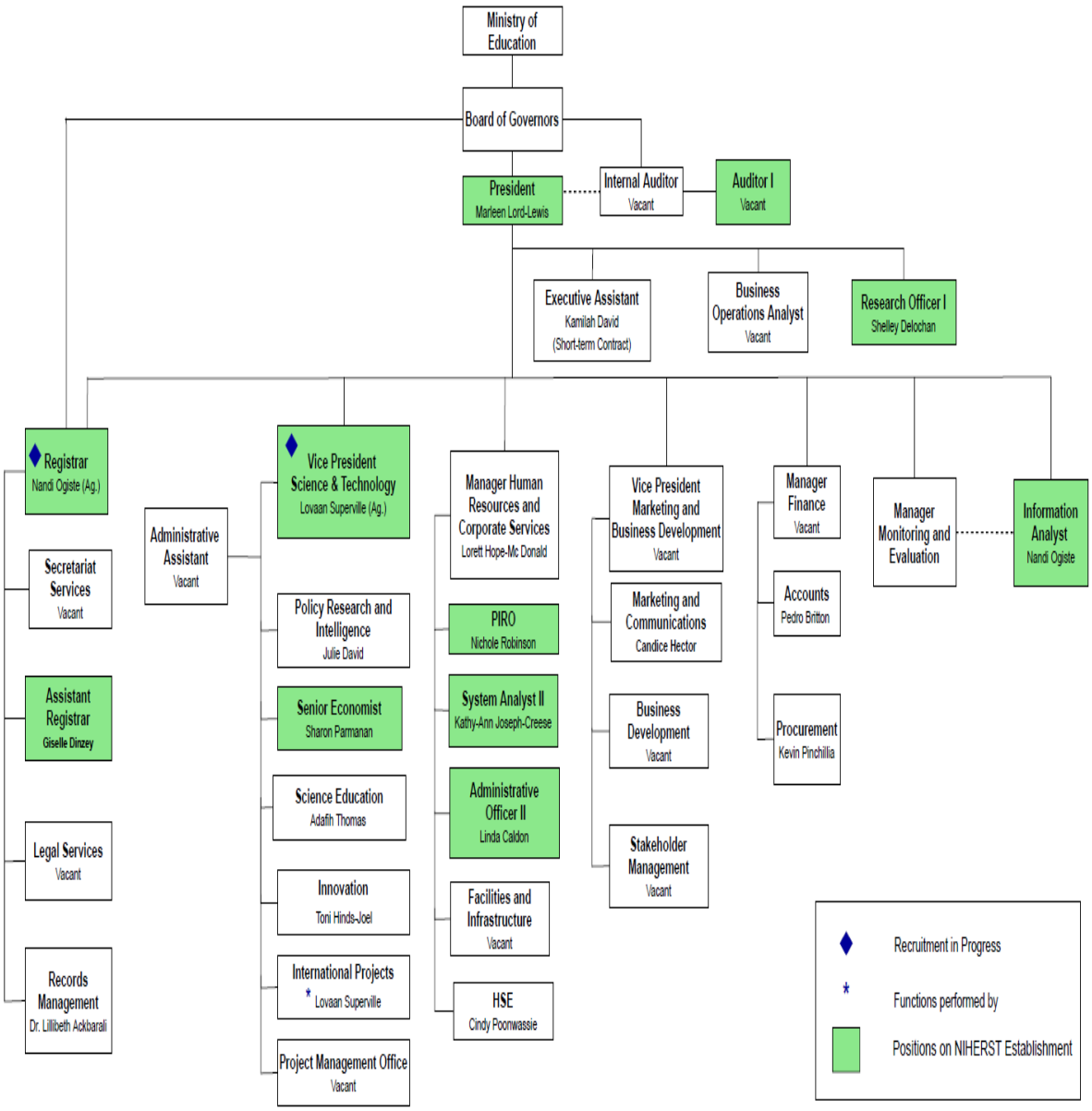
# Appendix IV

# NIHERST's ORGANISATIONAL CHART

**NIHERST Functional Chart Approved by the NIHERST Board of Governors on July 22, 2020**



**NIHERST Management Chart**



# Appendix V

## MINUTES OF THE MEETING

### HELD ON WEDNESDAY, MARCH 24, 2021

**MINUTES OF THE FIFTH MEETING OF THE JOINT SELECT COMMITTEE APPOINTED TO INQUIRE INTO AND REPORT ON LOCAL AUTHORITIES, SERVICE COMMISSIONS, STATUTORY AUTHORITIES (INCLUDING THE THA) HELD ON WEDNESDAY, MARCH 24, 2021**

**This meeting was held virtually via Zoom**

**PRESENT**

**Members**

| | |
|---|---|
| Dr. Varma Deyalsingh | Chairman |
| Mr. Esmond Forde, MP | Vice- Chairman |
| Mrs. Lisa Morris – Julien, MP | Member |
| Ms. Khadijah Ameen, MP | Member |
| Mr. Nigel De Freitas | Member |
| Ms. Jayanti Lutchmedial | Member |

**Secretariat**

| | |
|---|---|
| Mr. Julien Ogilvie | Secretary |
| Ms. Khisha Peterkin | Assistant Secretary |
| Ms. Terriann Baker | Graduate Research Assistant |
| Ms. Nicole Brown | Graduate Research Assistant |

**The following Members were Excused:**

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| Mrs. Ayanna Webster – Roy, MP | Member |
| Mrs. Renuka Sagramsingh-Sooklal | Member |

**THE FOLLOWING PERSONS WERE ALSO PRESENT:**

**National Institute of Higher Education, Research, Science and Technology (NIHERST)**

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|---|---|
| Mrs. Marlene Lord-Lewis | President |
| Ms. Nandi Ogiste | Registrar (Ag.) |

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| Ms. Lovaan Superville | Vice-President, Science and Technology (Ag.) |
| Mr. Pedro Britton | Senior Accountant |
| Ms. Julie David | Senior Policy Analyst |

**Ministry of Education**

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| Mr. Kurt Meyer | Permanent Secretary (Ag.) |
| Mrs. Lisa Henry-David | Chief Education Officer (Ag.) |

## INTRODUCTION

1.1 The Chairman called the meeting to order at 10:27 a.m.

## CONSIDERATION OF THE MINUTES OF THE 4th MEETING HELD ON FEBRUARY 03, 2021

2.1 The Chairman asked Members to examine the Minutes page-by-page.

2.2 The Minutes were confirmed on a motion moved by Mr. Nigel De Freitas and seconded by Mr. Esmond Forde.

## MATTERS ARISING FROM THE MINUTES

3.1 There were no matters arising from the minutes.

## PRE-HEARING DISCUSSIONS

4.1 The Chairman advised that the following entities will be appearing before the Committee:

i. The National Institute of Higher education, Research, Science and Technology; and
ii. The Ministry of Education.

4.2 The Committee was advised that pre-hearing submissions were received from the following entities listed in item 4.1 and circulated to Members via email and posted on *Rotunda.*

4.3 Issues Papers were also prepared by the Secretariat based on the pre-hearing submissions.

4.4 The Chairman reminded Members of the objectives of the inquiry.

4.5 The Secretariat made a presentation to Members on the key issues of the inquiry.

4.6 Members reviewed the Issues Papers and selected questions and issues each would focus on during the public hearing.

**PUBLIC HEARING**

6.1 The Chairman reconvened the meeting at 10:50 a.m. and welcomed both the listening and viewing audience.

6.2 The Chairman highlighted the objectives of the inquiry and introductions were made.

6.3 The Chairman then invited the lead official of each delegation to make a brief opening statement.

6.4 The following are the main issues highlighted during discussions with the **NIHERST and the Ministry of Education** *(for further details, please see the Verbatim Notes)***:**

**MOE's Vision for NIHERST**

i. The Ministry of Education's vision for NIHERST is:
   a. for the organisation to be a key driver in pushing a Science, Technology, Engineering and Mathematics (STEM) agenda in Trinidad and Tobago; and
   b. the use of technology in the current virtual learning environment provides further opportunities for school-aged children to develop an interest in STEM.

ii. The Ministry therefore sees NIHERST as a vehicle for brining technology into the classroom setting for all students from Early Childhood Centres to Secondary Schools.

**Collaboration between MOE and NIHERST**

i. The MOE is concerned about under-performance of students in the sciences and other areas. The Ministry is in the process of providing support for these

students. They require additional research on the issues affecting teaching and learning in order to develop solutions for these challenges.

ii. There is room for the Ministry to work more closely with NIHERST to incorporate STEM in the national curriculum.

iii. CXC is in the process of introducing new subject areas. As such, there must be consistent communication between the MOE and CXC in order to inform curriculum development at the national level.
The MOE will seek to increase consultations with tertiary institutions to align STEM programmes with the skills required in the labour force.

iv. The MOE intends to work with NIHERST to facilitate training of teachers in the use of technology to conduct virtual tours virtual field trips.

**Oversight**

i. A Cabinet note to appoint the NIHERST Board of Governors is currently with the Ministry of Finance. As such, the Board should be appointed shortly.

**Policy Environment**

i. The draft National Science and Technology Policy was completed in 2014 but it was recently submitted to the MOE in March 2021, following a request from the JSC to provide a copy of the document prior to the public hearing. An undertaking was given that the Policy will be revised within a six months' period.

ii. Given the de-linking of NIHERST from the then Ministry of Science and Technology, there is a need for a revision of this policy to align with its current operations under the Ministry of Education.

iii. Science, Innovation and Technology is the engine of growth for economic prosperity.

**Stakeholder Engagement**

i. NIHERST prepared a strategic plan for the period 2019-2022 which included the development of a virtual platform.

ii. Due to the Covid-19 pandemic, plans to use and develop the virtual platform have been accelerated. Some of the planned initiatives include virtual camps and virtual field trips.

iii. NIHERST works with students enrolled in the formal educational system. It also engages in community outreach to engage youth outside of the formal school system.

iv. NIHERST offers plans to reach out to the Ministry of Youth Development and National Service to engage youth in under-served communities.
v. They also use social media as part of their marketing strategy.
The Digital Fabrication Lab (Fab Lab) is located at the National Science Centre in Maloney and was established to stimulate entrepreneurship in Trinidad and Tobago. Plans for training includes topics such as Intellectual Property, Project Management and Computer-Aided Design (CAD).
vi. The Fab Lab has provided virtual training during the Covid-19 pandemic.
vii. NIHERST aims to expand the scope of the Fab Lab to become a Fab Academy, which will reach a wider range of entrepreneurs who are equipped to develop innovative products and prototypes.

**Staffing and Funding**

i. NIHERST has experienced a significant decline in funding.
ii. Loss of quality staff has had a negative impact on NIHERST's ability to support research and planning for the MOE and other government Ministries
iii. Staff health and safety during Covid-19 has been a priority. Staff are therefore rostered on a rotational basis. NIHERST would like to explore a work from home model for the future.
iv. NIHERST has the capacity to hire staff but must receive approval from the MOE.
v. There are currently 102 people employed, the majority of whom are employed on a contractual basis. There are 54 permanent staff approved under NIHERST's establishment.

**Collaboration and Partnerships**

i. There is currently no formal relationship with the Public Service Academy to provide training for Public Servants in research methodologies and practice. However, this is something NIHERST is willing to explore.
ii. Members of the public, educational institutions and other entities interested in partnering with NIHERST can contact their Marketing and Communications Unit.
iii. NIHERST has partnered with the Water and Sewerage Authority (WASA) in developing rainwater Harvesting Systems for water-scarce communities.
iv. NIHERST plans to meet with the Ministry of Planning and Development to discuss conducting a manpower audit of the STEM sector in Trinidad and Tobago with a view to identify future employment prospects in the industry.

v. NIHERST is working with the Intellectual Property Office of the Ministry of Trade and Industry to treat with Intellectual Property-related issues and have developed a draft MOU to address the same.
vi. The work of NIHERST complements the national curriculum developed by the MOE.
vii. NIHERST collaborates with the University of Trinidad and Tobago (UTT) in an informal manner, however, an MOU was drafted to address further collaboration and corporation.
**viii.** NIHERST has not collaborated with the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT).

**Future Plans**

i. The Institute desires a home base as the current Science Centre is not suitable.

**ADJOURNMENT**

7.1 The Chairman thanked Members and adjourned the meeting.

7.2 The meeting was adjourned at 12:43 p.m.

I certify that the Minutes are true and correct.

Chairman

Secretary

*April 01, 2021*

# Appendix VI

# VERBATIM NOTES

**VERBATIM NOTES OF THE FIFTH VIRTUAL MEETING OF THE JOINT SELECT COMMITTEE ON LOCAL AUTHORITIES, SERVICE COMMISSIONS AND STATUTORY AUTHORITIES (INCLUDING THE THA) HELD (IN PUBLIC) ON WEDNESDAY, MARCH 24, 2021 AT 10.50 A.M.**

**PRESENT**

| | |
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| Dr. Varma Deyalsingh | Chairman |
| Mr. Esmond Forde | Vice-Chairman |
| Mrs. Lisa Morris-Julian | Member |
| Ms. Khadijah Ameen | Member |
| Mr. Nigel de Freitas | Member |
| Ms. Jayanti Lutchmedial | Member |
| Mr. Julien Ogilvie | Secretary |
| Ms. Khisha Peterkin | Assistant Secretary |
| Ms. Terriann Baker | Graduate Research Assistant |
| Ms. Nicole Brown | Graduate Research Assistant |

**ABSENT**

| | |
|---|---|
| Mrs. Renuka Sagramsingh-Sooklal | Member |
| Mrs. Ayanna Webster-Roy | Member |

**NATIONAL INSTITUTE OF HIGHER EDUCATION, RESEARCH, SCIENCE AND TECHNOLOGY (NIHERST)**

| | |
|---|---|
| Mrs. Marlene Lord-Lewis | President |
| Ms. Nandi Ogiste | Registrar (Ag.) |
| Ms. Lovaan Superville | Vice-President, Science and |

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| | Technology (Ag.) |
| Mr. Pedro Britton | Senior Accountant |
| Ms. Julie David | Senior Policy Analyst |

**MINISTRY OF EDUCATION**

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|---|---|
| Mr. Kurt Meyer | Permanent Secretary (Ag.) |
| Mrs. Lisa Henry-David | Chief Education Officer (Ag.) |

**Mr. Chairman:** Good morning, ladies and gentlemen. I am Dr. Varma Deyalsingh, the Chair of this Joint Select Committee in Local Authorities, Service Commissions and Statutory Authorities (including the THA) of the Twelfth Parliament. This is our Fifth Meeting and our third virtual public hearing and I welcome you all. I give you all a warm welcome this morning.

And I would like to inform members of the listening and viewing audience that they are invited to post and send their comments via Parliament's various social media platforms: Facebook page, *ParlView*, the Parliament's YouTube Channel and Twitter or if you can contact members directly, you may and they would raise any issues you have in this forum, if you so desire.

Right now I would like to ask Members who are present here to please introduce yourselves and I am very pleased to have members of the NIHERST family here and also the Ministry of Education. So starting with the members of NIHERST, could I please get introductions of your members who are present? Mrs. Marlene Lord-Lewis, the President of NIHERST, could you please introduce yourself? I think you are mute, we are not hearing.

**Mrs. Lord-Lewis:** Are you hearing me, Chairman?

**Mr. Chairman:** Yes, thank you very much. We are now hearing you.

[*Introductions made*]

**Mr. Chairman:** Good morning and thank you for all being present today. At this stage, I would like the officials of the Ministry of Education to introduce themselves, starting with Mr. Kurt Meyer, the Permanent Secretary Acting in the Ministry of Education.

[*Introductions made*]

**Mr. Chairman:** Good morning and thank you, members of the Ministry for being here and also members of NIHERST. And I would like members of my Committee to please introduce themselves, I think starting with Ms. Ameen.

[*Introductions made*]

**Mr. Chairman:** Esmond Forde is also our Vice-Chair and also I would like Sen. de Freitas to please introduce himself.

[*Introduction made*]

**Mr. Chairman:** Thank you, Members, for being here. So first of all, I may say the—is Ms. Lutchmedial present? Any other members that I have left out? Okay. At this stage, if there are no members, when they actually make themselves present, we would probably introduce them.

So, at this stage, I may say the objective of this enquiry really is to—it is a public enquiry to look at the objectives of NIHERST. It is to really examine the role of NIHERST in the development of science, technology and innovation, that is the STI policy, to facilitate economic diversification; also to assess the challenges faced by NIHERST in fulfilling its mandate, and three, to examine the extent to which NIHERST has influenced the development of tertiary education and training in STEM. So at this stage, I would like to invite Mrs. Marlene Lord-Lewis, the President of NIHERST to please give us a brief opening statement.

**Mrs. Lord-Lewis:** Thank you very much, Chairman. Independent Senator Dr. Varma Deyalsingh; Mr. Esmond Forde, Vice-Chairman; Ms. Khadijah Ameen, Member of Parliament; Sen. Nigel de Freitas, and the listening and viewing public,

a pleasant good morning to all.

I am Marlene Lord-Lewis, the President of the National Institute of Higher Education, Research, Science and Technology, NIHERST. Joining me today at this sitting are my colleagues Ms. Lovaan Superville, Acting Vice-President, Science and Technology; Ms. Nandi Ogiste, Acting Registrar; Mr. Pedro Britton, Senior Accountant, and Ms. Julie David, Senior Policy Analyst. On behalf of our team and the institute, we wish to thank you for this invitation. We are pleased to be given the opportunity to offer insight into the operations of NIHERST and more so share with you some of our future plans.

NIHERST was established in 1984 under an Act of Parliament to provide and promote science, technology and higher education while enhancing the innovative, creative and entrepreneurial capabilities in the science and technology, relevant to the developmental needs of society. Its head office is located at Level 13 Education Towers, No. 5 St. Vincent Street, Port of Spain, while the main hub for science and technology engagement is located at the National Science Centre in Maloney.

Over the past 35 years of existence and five successive Presidents in leadership, the institute has and continues to make a consistent impact towards building a national capacity in science, technology and innovation. The work of NIHERST is supported by contributions of, in the main, the Government of Trinidad and Tobago as well as corporate partners in the advancement of the national STEM agenda. The institute has weathered the many storms of the 21st Century, notably the global financial crash of 2008 and now the COVID-19 pandemic. Through all of this, employee resilience has shone through, a testimony to the core value of teamwork which is embedded within the organization.

Appointed in August 2019 as President to lead the institute's strategic agenda, our mission is to stipulate sustainable national capability and the capacity in science, technology, innovation and technopreneurship through insightful research and

relevant programmes. The role of NIHERST in the development of science, technology, engineering and mathematics in Trinidad and Tobago is the subject of today's enquiry. NIHERST, as a statutory body, exists and operates to meet the country's developmental needs for scientific research in sectors such as agriculture, ICT, energy services and the emerging animation industry.

Further, as a national leader in the promulgation of STEM education, the institute plays a crucial role in fostering a scientifically literate citizenry through the management and delivery of informal learning experiences. Under the leadership of its line Ministry, the Ministry of Education, the institute's enquiry-based approach to learning is structured to complement the formal curricula delivered through the Ministry. With the global recognition of STEM as the driver of jobs in the future, this holistic model of learning for science, technology, engineering and mathematics, not only provides our nation's youth with increasing life chances but is a main strategy in future-proofing the country's workforce.

NIHERST, as a national institute, remains well positioned to lead the national effort in STEM to enable our society through science, technology and innovation. We press to the future, embracing opportunities to bring new knowledge to the nation's youth, to families and the wider community. Permit me to end with this quote:

> "Whatever is true, whatever is noble, whatever is right, whatever is pure…think on such things."

The cause of NIHERST is a noble one, that is, to build a better Trinidad and Tobago. I thank you.

**Mr. Chairman:** Thank you, Mrs. Marlene Lord-Lewis, and that is in fact a very, very important quote: to build a better Trinidad and Tobago. And may I add "Caricom" also because I think your roles may now—I do not know. When we are discussing your roles, you will have to probably enlighten me if your role would now be expanded or has it always been something—I know you have international

agencies that you are partnering with but with our Prime Minister now Head of Caricom, you will have to look at that role, looking at even our economic problems that we have.

But it is a very, very important role and I am happy you gave us a little history of the organization, and a 37-year-old organization, and I think it is the first time we are having you before a joint select committee because we see the importance of your role and your continuing role.

At this stage, I would like Mr. Kurt Meyer, the Permanent Secretary Acting to the Ministry of Health to please give us some brief opening remarks.

**Mr. Meyer:** Thank you, Chair. Chair, members of the Committee, NIHERST President, members of NIHERST, Ministry staff, members of the public. The NIHERST has always played a pivotal role in the education landscape of Trinidad and Tobago by focusing on the advancement of science, technology, engineering and mathematics among our children, the human capital of tomorrow. Today's world is one in which technology would be a key player in the competitive future of our country.

The challenges of the past year, brought about by the COVID pandemic, would have changed the way we do business, even the way in which we deliver education to the approximately 260,000 students enrolled in classes from early childhood, secondary to tertiary levels. The pandemic has forced us to rethink the relevance of what we do and how we do it. It has also created a golden opportunity for us to change the way we deliver our educational service and our actual education product. NIHERST is key to that change. Its long history of promoting science and technology and innovation among children must rise to that challenge.

The Ministry is aware that processes must change and that we cannot afford to be left behind using yesterday's approaches or methodologies. NIHERST is and will be a part of that change. Thank you.

**Mr. Chairman:** Thank you, Permanent Secretary. And I must endorse the importance of NIHERST because, traditionally, Caribbean countries have earned revenue from either exporting primary products such as agriculture, minerals and even tourism activities. In Trinidad and Tobago, the main exports since 1970 has been in the petrochemical domain but now we have the economic shocks, as mentioned by the President of NIHERST, that—the whole economic fallout, the COVID and that has caused the depression in oil and gas prices.

So therefore, at this stage, with the increasing unemployment, stagnated economy, NIHERST has a major role to play. We have seen phases, in the last century, of development, post-industrialization and now the new economy known as the knowledge-based economy. So the economic success is the knowledge-based economy and this has been identified as developing our human capital and NIHERST has an important role in this.

There was the global competitiveness indices and it listed different countries and the Caribbean fell short of some other countries, but Trinidad and Tobago actually led in this as we were one of the first countries to actually have a dedicated body for this, you know, to help our human capital in science and technology. So therefore, we are very, very interested to hear what you have for us for the future of Trinidad and Tobago because children are born with a blank slate of mind. They need to get some sort of impetus, some sort of knowledge, some sort of interest, rather than go into gangs and all these negative things we are seeing. So even getting the minds of our young ones, I think it is very important to have scientific-related curriculum, career choices, which supports knowledge economy and I think it is the way for economic development and it is a paradigm shift we have, we know we have to do it and I am thinking together we can get an idea how best we can help NIHERST in this venture to help our country in the long run.

So at this stage, I would just like to start some of the questions rolling and I would

like to put a question to the Ministry of Education. Now, I would like to look at the revised role of NIHERST. In the submission from the Ministry of Education, we saw that your submission stated that:

> In light of the diminished role of NIHERST with the establishment of ACTT, COSTAATT and UTT, there is a need to re-examine the relevance of the institute and its current configuration. Further, the research conducted by NIHERST should be informed by the Ministry of Education's needs and the findings should inform science strategies at all levels.

So this was the Ministry of Education's submission, page 4, question four that we had enquired on. So I would like to ask now: What is the Ministry's vision for NIHERST over the next five to 10 years? I heard some positive things from the PS and I heard the willingness from NIHERST. So what is Ministry's vision and how soon can the Ministry commence its re-examination of the relevance of NIHERST, if you think we need to now re-examine the relevance? So over to you, Mr. PS.

**Mr. Meyer:** I will begin, Chair, and then the CEO will probably continue. But our vision for NIHERST is literally an engine room to push a STEM agenda. We actually have with COVID, a competitive advantage right now. More of our children are actually connected than have been connected at any point in time. So we have an opportunity, using the technology, leveraging the technology to actually bring science to more of our students at a greater frequency than we ever had before. NIHERST is actually the best place to do that for us now, to augment what happens in school, to literally provide a science curricula, to provide an agenda, to provide a future 24/7. And that is a role I think NIHERST is more than capable of taking up for us. That is a mantle that needs to be done.

We have done things in the past, we have spent money in places that maybe we need to redirect those resources but I think NIHERST—in fact, from the meetings we have had with NIHERST recently, they have shown a great willingness to embrace

a new way of doing business, to find a way to perhaps bring technology, bring the learning to more people, a greater number of students, a wider group of students, even from the earliest stages. I think they have actually even started to do work with our ECCE students, to prepare our CSEC students, to prepare our CAPE students. That is the vision for NIHERST, an engine to drive technology in this country. CEO.

**Mrs. Henry-David:** Good morning. So to take off from where PS Meyer left off, we envisage NIHERST as bringing the technology into our classrooms from the very smallest children, three years old, straight up to A levels, at CAPE level. There are numerous subject areas that NIHERST can add value to in terms of utilizing the technology. We are even envisaging a role in terms of teacher training to utilize the technology. We are looking now at the possibility of virtual tours and virtual field trips so that all of our children can now access the wonders and beauties of our country, and they can understand how the science—the classroom science, what is in the textbooks—is brought to life and realized within the classroom.

What we need and what we have started at a fledgling level is to have talks with NIHERST and to see how our vision and their vision can mesh and mould and meld so that we can take advantage of the strides we have made during the pandemic, to take advantage of the virtual classrooms that we now find ourselves a part of it. Because even when COVID-19 is beyond us, we will still be able to build upon the framework and the foundation that have been established thus far.

**Mr. Chairman:** Thank you very much for that comforting words that NIHERST is still in the driver's seat there, still assisting. But I am putting out this question to both the NIHERST and to the Ministry of Education. With COSTAATT on board there, what is the role of NIHERST? Is their role diminishing or is there duplication of roles in terms of development policy? And in terms of the education policy, I think NIHERST had mentioned that there was a policy that was formulated, I think, in 2018 and the Ministry for that science policy has yet to implement that policy into

our curriculum. So I would like two comments on both sides. So starting with NIHERST first. Thank you. You are—

**Mrs. Lord-Lewis:** Thanks to the Ministry—are you hearing me? Thank you, Chair and thanks to the Ministry for the vision that has been articulated. NIHERST, as you may know, in 2019, prepared a strategic plan for the period 2020—2022. That plan, of course, was prepared prior to COVID-19. However, the plan envisaged that we would be moving towards a virtual platform. And I am pleased to indicate to the Committee this morning that NIHERST has started the work of virtual delivery of its camps or its products, which includes the camps. NIHERST has started looking at virtual field trips and we should, in the second quarter, be able to comfortably launch virtual field trips. Of course, discussions will have to be held with the Ministry to ensure that what we are delivering is what the Ministry would like for its student population.

As you may know, Chair, NIHERST delivers its products and services not only to the student population but we do treat with community outreach and community outreaches are geared towards meeting the needs of those youths who are not in the formal school system. So therefore, as far as the role of NIHERST in delivering its products, its services, ensuring that science and technology reaches far and wide beyond the student population and into the communities, NIHERST, through its strategic plan, has already started the delivery of those services as well as continues to build new products and services for the purpose of enhancing STI into the nation's population.

As far as the science policy is concerned, Chair, we had developed a science and technology policy which, in draft, was completed in 2014. Quite recently, with the JSC comments, we delivered a draft of that science and technology policy. I would ask Ms. Julie David, our Senior Policy Analyst, if she can join in at this point in time to give and shed some further light on the science policy. Julie?

**Mr. Chairman:** Thank you.

**Ms. David:** Good morning once again. In 2014, there was the completion of a draft national science and technology policy. It was a very inclusive approach taken in the formulation of that policy, seeking the input of several stakeholders. There were about six consultations held with specific stakeholder groupings including the scientific and research and educational institutions, as well as civil society, as well as the Tobago cohort, also the energy, non-energy sector and also with Government officials. Coming out of the policy—and may I add, it is a dynamic document that is subject to be revised for its relevance and applicability depending on the various contexts that we are faced within the STI landscape.

But the objective of the policy was really to grow what we will call critical inputs; critical inputs meaning trying to sustain increases in public and private expenditure on R&D. Also, we wanted to look at supporting the development of human capital. Definitely, you need to generate that critical mass of researchers, scientific technicians and technologists and equip them with the relevant tools and skills to solve the problems. We talked about also strengthening coordination, collaboration and governance and also increasing national benefits from S&T. We would have identified some priority areas and divided it along the lines of systematic and problematic problems. And the problematic problems, we were looking at areas of health, non-communicable diseases, looking at climate change issues, looking at flood mitigation strategies. With the systemic areas, we were looking at areas of governance, areas of funding for research.

**Mr. Chairman:** So am I to understand that this policy was in draft for six years and it was given to the Ministry recently? How recent was it given to the Ministry?

**Ms. David:** It was given to the Ministry when the request was made for this draft coming out of the questions submitted from the JSC.

**Mr. Chairman:** So this draft was sitting at NIHERST's desk for a while. Is it only

when this Committee asked for it, it was sent to the Ministry? I am trying to figure—it is beautiful work that you did. Is it that that work was not given to the Ministry in a timely manner or is it only recently it was given to the Ministry? Because I want to try after to ask the Ministry if they now have this report, when consideration will be given like a timeline? So could you just clarify the draft that was done, when was it submitted to the Ministry?

**Ms. David:** So let me help you in understanding some timelines. That policy would have been drafted between the period of 2013—2014 and that is with the use of the medium-term policy framework which was the National Development Plan at that time for the country. The draft was submitted to the executive management in April 2014. Following after that, I would have had a meeting with my former President, looking at the areas that were in need of amendment, and the areas were amended and a revised draft was created. At that point in time, around 2015, we would have had the delinking of the Ministry of Science and Technology, and then coming under the Ministry of Education, there appeared to be a shift in focus away from the policy, you know, the STI policy at that point in time.

And I must add that in my recognition of important elements within the policy, when formulating the strategic plan that we have, the 2020—2022, I included an STI roadmap so as to capture some of the important elements that were spoken of in the policy document.

**Mr. Chairman:** Okay. So I am hearing it is six years this policy was there but there was a change in the Government's policy in terms of the need for this to be established.

**11.20 a.m.**

**Mr. Chairman:** So, if you are going to have to revise this policy, do you have a timeline that you made need to have that revision; in view of the fact that, you know, we have COVID and you may have new elements put in?

**Ms. David:** Correct, I would have to have virtual, either focus group sessions or consultations with some of the stakeholders once again to recognize what are the challenges and I would estimate perhaps between six to eight months given the—

**Mr. Chairman:** Thank you. Because remember right now, we are in an economic crisis and we are looking at moneys spent in giving us a report. So I think the populace would want to know that they are getting their worth. I think we need to show that somehow a report was there. Times have changed. We are now revising that. But within six to eight months we may be now pushing that report to the Ministry of Education now, to see if they would now move forward. So a question I would like to direct to the Permanent Secretary: Is that still on the Government's agenda to, if you get that report that you would now try to implement it into the national curriculum? That is one question.

The second question: If we do implement that, how will that work with the fact that CXC, the examination of CXC—do we need a buy-in from them to say that, you know, that they would be formulating exam? We may have a different sort of a schedule for our students to learn. Do you have that link with the CXC, the Caribbean Examinations Council, to see if first, if we get this implemented in our policy in our schools, how are we going to get the buy-in from the CXC?

**Mr. Meyer:** Okay, I will answer the first part and CEO will take the second piece. With regard to the report, I am going to speak to the President about accelerating that timeline. I think eight months is a little too long. I am sure we can get a revised report to us within a month. Because we did review the document and it is not—I do not think there is that much work that needs to be done on it. And I think CEO can answer the second part of that question. CEO.

**Mrs. Henry-David:** So, with respect to the inculcation of what is in the report at Forms 4 and 5 and 6 levels, what we really need is to have the product of NIHERST dovetail with the CXC curriculum, rather than the other way around. We can work

with NIHERST at the early childhood and primary and lower secondary levels where we are in control of our curriculum where we write our curriculum and we can set the foundation, working hand in hand with NIHERST, to ensure that what is done supports the curriculum and is broad-based enough so that it can transition, the learnings can transition at the CAPE and CSEC levels and—CXC for example is in the process of introducing a number of new subject areas. So we need to be agile and we need to continue to scan the environment to ensure that what we produce and how the collaboration between the Ministry and NIHERST produces, how it supports the CXC curriculum and of course there is always collaboration between the Ministry of Education and the CXC. So we have fora where we can present our ideas to them and see how we can have the work of NIHERST further inculcated into the CXC curriculum.

**Mr. Chairman:** Thank you and I am encouraged by what I am hearing. A concern I have, you know you have NIHERST there, we have seen the importance. We have seen, we want to bring the timeline in quicker, which I think is very much needed. But in the submission, you know, NIHERST had given us the issues paper, Ministry of Education, what I am looking at. I am looking at the fact that, in the submission to the committee, NIHERST reported that it had been operating without a board of directors since July 2020. And this was given in NIHERST's submissions page 51, question 5(iv). So directed to the Ministry of Education officials, what is the cause for delay in the appointments of a board of directors of NIHERST seeing that we now realize it is so important? And what measures are being taken by the Ministry to urgently address this issue? And what again is the estimated time frame for the completion of the board's appointments?

**Mr. Meyer:** The current board will be appointed within a very short space of time. The Note is with the Ministry of Finance. So that should be done very, very, very quickly.

**Mr. Chairman:** I am sure that is probably very good news for the President, Mrs. Marleen Lord-Lewis, that at least she will be getting some staff to expedite this.

But again, I found something interesting. Recently in Parliament, there was a Bill that came to reduce the members of the board. I think it was from 12 to 5. So, seeing the importance of NIHERST, seeing that I personally think it is such an important entity for our country, Ms. Marleen I would like to ask a question: That process of reducing the board members from 12 to 5. Were you consulted in that? Do you think it is a good idea? Do you think it could be a cost-saving venture also? Because remember you could downsize certain boards. I think WASA's board was increased recently. So, in terms of the board and the members, were you consulted? Do you think you need more board members to help in your—you could probably put that in writing if you do not want to do it publicly. So at least any sort of recommendations you make, we can give it to the relevant Ministry.

**Mrs. Lord-Lewis:** Yes, we will definitely put it in writing, Chair, because we do have some views with regard to how a smaller board will be effective in driving science and technology.

**Mr. Chairman:** Good. I would like to ask a next question. I think member Forde had a question that he wanted to direct to—

**Mr. Forde:** Mr. Chairman, thank you. The Accreditation Council of Trinidad and Tobago, is NIHERST governed by having to be registered with the Accreditation Council of Trinidad and Tobago?

**Mrs. Lord-Lewis:** NIHERST, the programmes are not registered under the Accreditation Council. The programmes that NIHERST has developed. What I would ask is Ms. Ogiste, who is our Registrar and who was part of that particular process, if she can share the intention of the ACTT as well as the alignment of our informal products that we deliver to the population, as it relates to the Accreditation Council.

**Ms. Ogiste:** Through you Chair, the Accreditation Council of Trinidad and Tobago has its mandate, which really speaks to addressing the accreditation status of the quality of academic programmes. Therefore, the programmes that NIHERST offers fall outside their remit.

The Accreditation Council, as you may know, the origin started within NIHERST, through the committee on the recognition of degrees, which basically started with the foreign qualifications and then expanded to look at the accreditation status of local institutions and programmes and NIHERST was very instrumental, actually led the initiative to formulate and establish the Act to establish the Accreditation Council of Trinidad and Tobago, as an independent body. I hope that answers your question.

**Mr. Forde:** Thank you, thank you. Mr. Chairman, follow-up question, again directed to NIHERST. You stated that there was, and I quote:

> A reduction in the percentage of qualified full-time staff conducting research. This was as a result of the resignation of policy analyst and prioritization of areas during COVID-19.

That is stated, Madam President, on page 14, question 4(iii). And the question I ask: How has NIHERST maintained its efficiency in light of its staff reductions? That is one. And secondly, how has the COVID-19 pandemic further impacted the operations of NIHERST? Thank you. Mr. Chairman, I was heard?

**Mr. Chairman:** You were muted.

**Mrs. Lord-Lewis:** Of course, NIHERST has continued its operations with great difficulty. The resignation or the loss of quality staff has impacted the ability of NIHERST to drive the strategic plan or the strategic agenda that speaks to research development.

Now, as far as the collaboration with the Ministry, you will recognize that that collaboration requires that NIHERST also supports research and planning within the

Ministry of Education, as well as research as required by other Ministries, because the NIHERST agenda spans across Ministries. So we have had some challenges in terms of our research area, not only in terms of the quality of staff or the retention of staff, but in terms of funding.

So, just to give a sense of the Science and Technology Division, we do have two areas of research which is the policy research as headed by Ms. Julie David and the statistical surveys, which is headed by Ms. Sharon Parmanand. Both areas have suffered from funding to advance the work of the departments. They have also suffered from the ability to recruit staff, based on the concerns and based on the constraints that have been recently put upon state enterprises or statutory bodies as ourselves. But we do have very experienced persons within the organization. And that experience has aided NIHERST in developing the frameworks for the research projects.

We have support staff from OJTs or short- term professionals who have joined the organization. We have had to bring in short-term professionals and that assists us in developing the work. But there is a gap between what our strategic plan calls for and what our capacity is, based on the constraints that we have suffered.

As far as the COVID-19 pandemic is concerned, as with all other organizations, the protocols that we have had to put it place have caused us to have our staff as the first priority. So we do have rotation that happens within the organization because of unique situations with the staff. So the COVID-19 pandemic has caused some disruption within the organization. We have also seen that a working from home model is something that we would want to look at to determine the feasibility of that option in the future. We, however, work to ensure that our staff is safe and that is our utmost priority.

**Mr. Forde:** Mr. Chairman, follow-up please. Madam President, NIHERST has its own powers to employ individuals, or you have to go through the Ministry of

Education?

**Mrs. Lord-Lewis:** Under the Act we can employ. But we do have—an approval from the Minister is required when we employ staff. The NIHERST has an establishment, which has been in 1984, when the organization started. Sometime afterwards the establishment was determined and the establishment comprises 54 permanent staff. You will recognize that our submission, we have indicated that the staff compliment of NIHERST is 102. Most of the staff is made up of contract employment. So we have been able to engage through contract employment, the staff that is required, in order to deliver on the work programmes of NIHERST. If we are to look at permanent employment, we need to go to the Minister to get that approval.

**Mr. Forde:** Final question, Mr. Chairman, final question. Now your board, since 2020, mid-2020, has not been in place. Right? So you all are basically operating on policies that have been set by the last board and in anticipation of the Permanent Secretary Mr. Meyer mentioning that you would be getting a new board, we are anticipating that with the new board and chairman of this board would be able to operate in synergy with what you have to fulfil in going forward and then they may come with a new mandate. Again, as the President you are anticipating in a smooth flow and to ensure that operation continue efficiently and effectively.

**Mrs. Lord-Lewis:** Absolutely. We do hope and we continue to have good relations with our board and with our Ministry. The word collaboration or deeper collaboration with the Ministry is important as we go forward. And you are correct, the board may come in with a different mandate. But history has shown that there is good relationship between the board, the ministry and the management in advancing the cause of NIHERST. We are, however, quite capable and cooperative, in terms of the new mandate of the board. This is a different time, COVID-19. This is a board that would be coming in and starting off its activity under the umbrella of a COVID-19 environment.

**Mr. Forde:** Thank you very much, Madam President. Mr. Chairman, I am fine.

**Mr. Chairman:** Thank you. I think member Khadijah Ameen has a question for the members of NIHERST.

**Ms. Ameen:** Are you hearing me?

**Mr. Chairman:** Yes, we are.

**Ms. Ameen:** All right. So my question had to do with the new lab that was being set up. When you—I am just looking for the issues sheet here, sorry—sent your report you indicated that the NIHERST Digital Fabrication Laboratory is the first of its kind to be registered in Trinidad and Tobago and in the region. I wanted to get an idea of how much money was invested to create this lab and what sort of notable achievements you all would have had from this venture and what you look forward to in the next three to five years, in terms of outcomes, or what you expect to do with this digital fabrication lab? But can you also tell us how much money was invested to create this lab?

**Mr. Chairman:** I think you are muted, thank you. You are muted.

**Mrs. Lord-Lewis:** Thank you, Chairman. The Fab Lab is our strategy, and it represents a physical suite of tools that are used for the stimulation of entrepreneurial activity within Trinidad and Tobago. The lab is located at the National Science Centre in Maloney and it is a collaboration with MIT, in terms of the use of the MIT brand to advance digital fabrication.

I would invite the Vice-President, Science and Technology, who spearheads the development of that activity under the international projects or the innovation area, to give further details as to expenditure, if we have it. If we do not have it at this point in time, surely we would be able to document and send it to the committee. But I invite Lovaan Superville as Vice-President, Science and Technology, to expand on the Fab Lab and the current move to move from a Fab Lab to a fab academy. Thank you.

**Ms. Superville:** Hi, good afternoon. Definitely we would have to submit in writing with regard to the cost to implement this Fab Lab. So the Fab Lab, over the last six years, would have promoted the development of those 21st Century skills, innovation and creative skills. The major target audience within that period would have been the primary and secondary school students who would have learnt to make almost anything with this digital fabrication technology.

We have however, over the last, I would say, five years, tried to change that target audience and start to focus also to include entrepreneurs. And we would have started to include intellectual property clinics and expanding our reach, as well as meet the entrepreneur. That is another series that we would have developed to include and incorporate the entrepreneurs. And this would have been where successful entrepreneurs utilizing the Fab Lab would have presented their case study, their story of how they were successful, utilizing the Fab Lab to develop certain products and services.

Of late, we would have assisted the artisan community, in particular, to develop a product totally made in Trinidad and Tobago. And these products have been exported as well too. And they have said that the Fab Lab to them was like the best kept secret. We do not want that, you know. Through the series, the entrepreneur series, we aim to share and showcase the benefits of the Fab Lab.

Today we have personnel within the Fab Lab seeking training and we want to transform the Fab Lab into a fab academy, where we want to grow the number of persons that are exposed to this digital fabrication technology. Because it is meant to be a less expensive means of prototype development. So instead of spending—it is generally quite costly to develop a prototype, and through the services of the Fab Lab, that cost is drastically reduced.

So, we want to be the institute that propels and encourages other institutions, whether national, whether government or non-government, to develop their own Fab Labs so

that no longer does someone have to come to D'Abadie to utilize and tinker within a lab setting.

During COVID however, we have switched to virtual, where we would have been providing training for, whether it is entrepreneurs, hobbyists or artisans to utilize sometimes, whether it is the free technology, which is Tinkercad, which is a software programme where you can design your product and then you can send that design to the Fab Lab and we can print it out for them. So we are doing both models presently.

**Ms. Ameen:** Another thing, of course, would have to be with the ability of NIHERST to have professional development to advance the Fab Lab and the fab academy. You indicated that you had approval for some funding from the European Development Fund in August 2020, for development in terms of training. So has this—well you indicated you had approval—money been disbursed? What is the amount, and about how many people would be benefiting from this training?

**Ms. Superville:** Madam President, should I continue?

**Mrs. Lord-Lewis:** Just in terms of—the money has been approved and we can send you a schedule as to the planned disbursement. But suffice it to say that the intention is to train six of our technicians within the Fab Lab that now operate within the Fab Lab.

At present there are three technicians that are being trained and we have rescheduled the other three to be trained next year. So the disbursement of the money, we have gotten a schedule from the Ministry with regard to that particular activity. We can present to you what the overall schedule is. We do have three persons in training at this point in time with the fab academy training and we will train a further three next year. Lovaan, do you want to add to that?

**Ms. Superville:** No, I think you were able to capture it.

**Ms. Ameen:** All right, can you give us an idea of what are some of the key components of the new training activities?

**Ms. Superville:** So, key components of the training activities would be like project management; CAD, which is Computer Aided Design; computer control cutting; electronics production; computer control machining; moulding and casting; 3D printing and scanning; input devices; embedded programming; so programming of various sorts, as well as intellectual property invention and income. Those are some of the areas the team will receive training in.

**Ms. Ameen:** Personally, I think NIHERST is one of Trinidad's best kept secrets. My son has participated in some of your training camps, and so on, and I know that you have a lot of resources. My concern is that this is a fantastic programme to help towards the recovery of the economy, assisting entrepreneurs in creating employment. And from—in terms of meaningful employment where young entrepreneurs have this support to launch a business. What measures do you have in place to market this programme and to engage and to reach out to a wider number of citizens, so that they can access this opportunity?

**Mrs. Lord-Lewis:** Well, as we mentioned earlier, with the training done under the fab academy, we are now available as NIHERST to expand or extend training to other parts of the society. We do have some areas that we would want to focus on and suffice it to say that we are focusing on youth development in underserved communities. That is one area that we would want to offer the opportunity. So we do hope to work with the Ministry of Youth Development and National Service, with regard to reaching out to that particular community to build the sense of entrepreneurship for those citizens. And that is one area that we will be focusing on. We have developed a marketing strategy, a marketing campaign that treats with reaching persons through social media, and that campaign has shown some success, in terms of the use of social media to reach out to parties who can then express their interest through our marketing department in order to advance their interest in entrepreneurship.

So, as far as extending the reach of the opportunity, we do have a sense of where we would want to target first, who we would want to target. But, of course, as you mentioned, it is the best kept secret. But we do have persons who have heard about the secret and who approach NIHERST on a regular basis for use of the facility in order to advance their own products or develop their prototypes.

**11.50 a.m.**

**Ms. Ameen:** Thank you, that is much appreciated. Mr. Chairman, I do not know if it is possible for NIHERST to send us that document in terms of their marketing plan. And I think it is something that the Committee could discuss and make recommendations because, for instance, where we have young potential entrepreneurs in places like UTT and so on, you know, we may be able to make some recommendations to reach out to more persons who can benefit. Because I really believe the key to, you know, this thing is not just jobs but entrepreneurship to improve people's future. And it certainly falls in line with some of the development goals—the national development goals. So I would appreciate if we could—the Committee could have the opportunity to look at your marketing plan and make some recommendations perhaps to the Ministry and so on.

**Mr. Chairman:** Sure. I think this is something we need to—if you can give us that plan, as member Ameen had suggested. Right now I would like to welcome on board the Minister in the Ministry of Education—Mrs. Lisa Morris-Julien is here with us. So welcome and thank you for being here. I think you know we are now discussing the importance of NIHERST in carrying our country forward and, you know, I am very pleased you are here to get to see the discussions we have had so far and welcome aboard.

**Mrs. Morris-Julien:** Thank you so much, Chairman. Good morning everyone.

**Mr. Chairman:** At this stage, we got a question that was posed to the Committee and I would like probably NIHERST to see if they can address this. So this question

came in: Given the lack of research within the public service, does NIHERST have any partnership with the Public Service Academy for the provision of research training to officers in the public service?

**Mrs. Lord-Lewis:** Well, Chairman, I must say that is an excellent question. In terms of training, from my recollection of the records—and I would ask Nandi to join in—but we do not have a formal arrangement with the Public Service Academy to offer training in research. But definitely that is an area that we can look at because the unique offering that we have, based on the expertise within NIHERST for research both from the quantitative and qualitative side, does lend itself to being able to deliver that into the public service for the benefit of the society. It is one strategy that we do recognize is missing in terms of advancing S&T into the—and promoting S&T into the population. So it is an area that we can look at.

We have, however, been approached through UWI as well as UTT and other agencies to deliver talks on various subject areas. And we have been a part of that agenda with our universities. But in terms of the Public Service Academy, we do not have, at this point in time in my recollection, an arrangement, formal or otherwise, with the entity to deliver such. I would ask Nandi if in the area of information or the Registrar's area, if there has been a time that we have cooperated with the Public Service Academy for delivery of training. Nandi?

**Ms. Ogiste:** Thank you, Madam President. Through you, Chair, I am not aware of such linkage but I think it is a very good idea to build national capability in a very important area as research. So, you know, I really support the President's recommendations and comments.

**Mr. Chairman:** Well, I must say when I looked at the research you did so far, it is very impressive. The details that you went into, looking at the educational system and the ability of students to perform in mathematics, I mean, it was very, very precise. And I think you are the envy of a lot of persons now doing research. And I

think you have mentioned that persons did reach out to you. So I think you will have to expect that even with your probably reduced budget, more persons may be reaching out you to help with this research.

But I would like to—you know, so we have been hearing discussions that yes, we know your importance, funding is an issue, board membership is an issue, finance is an issue, but I need to just draw your attention. Right now in the United Kingdom, Wednesday the 24th of March, 2020, there is a debate in Parliament where they are looking at science and discovery centres, which is just like NIHERST, support for the education in science in careers in STEM subjects.

So presently, in the UK, there is a debate on the UK—the Government in the UK actually not supporting STEM in schools after the impact of coronavirus pandemic. So somehow the challenges that we are facing down here, we are seeing it in the UK. And this is a detailed report where a colleague in the United Kingdom Parliament sent to me actually, listing some of their challenges. They are looking at STEM in schools, the impact of the coronavirus pandemic. They are looking at financial support for providers affected by pandemic restriction. And they are actually saying that there are other bodies that are giving support, like certain NGOs, certain, you know, companies that need this scientific development. And it was amazing to find that a letter signed by 157 STEM professionals said that the sector was at imminent risk for, you know, a major disaster if they are not supported. And they were actually asking for 25 million of emergency financial support for their sector.

So looking at this list, we saw many scientific centres have also had redundancies, you know, in staff and also had to take out loans. And they actually are knocking at the doors of the Government to protect this precious national asset, which you are, to continue to engage young people with science for years to come.

Another challenge they looked at is STEM A level entry. So they actually looked at the persons entering the A level or the CAPE, you know, and comparing that there

was a drop. So in England they said there were A Level students entering with any math subjects, you know, increased from 35 per cent in 2015 to 2019, but they went on to say there was also a drop in certain science subjects that occurred.

I looked at your report and it was detailed. And in your report what struck me also is the fact that in a lot of our, you know, educational systems you had noticed that the females seemed to be far surpassing the males in entrance in to certain professions. And I think this is something, I think, the Ministry of Education will need to address in case we have the—our males in society, young boys who may be having that level of being lagging behind. So a disparity is alarming with boys being left behind. And again, this was also noted—

**Mrs. Morris-Julien:** Chairman—

**Mr. Chairman:** Yes.

**Mrs. Morris-Julien:** Sorry for the interruption, but I just want to declare my interest as Minister in the Ministry. But I see my very able PS is there and I am paying very close attention, Chairman. As you know, I respect your views a lot and I am taking notes. Thank you.

**Mr. Chairman:** Yeah. So definitely I will get the views from your PS and I would—so I was looking at this paper that was given in terms of the United Kingdom debate that is about to occur. And it is a similar debate that they are looking at—[*Interruption*]—similar debate that they are looking at. So therefore, PS, are we going to look at any sort of disparity in males that we see in the educational system? Have you thought about any means to address this that we are seeing here?

**Mr. Meyer:** The problem with male participation, not just in science but overall, it has been a concern for us and we are developing strategies to try to address it. CEO could perhaps elaborate on that.

**Mrs. Henry-David:** Thank you, Mr. Chair. The issue of underperformance, as the Ministry considers it, is not only a male issue, having looked at studies that would

have been done by the University of the West Indies and so on. It is also an issue that plagues certain socio-economic strata, whether the student be male or female.

The Ministry is acutely aware of the issue of underperformance and our strategies range from curricula support to other types of supports; psychosocial support for our students as well as support systems, such as meals and transport to ensure that the children get to school; to ensure that when they are at school, they are focused; to ensure that we capture any issues that may be preventing them from accessing learning.

So, for example, we have screening of our youngest students as they enter the system to see, for example, if they need glasses and such. We continue to provide the Student Support Services and we are continuously working—there is work between the Student Support Services and the curriculum division as well as supervision, to identify students that may have challenges, and to address those challenges through the curriculum and through teaching and learning methodologies.

These efforts can be supported by research on areas which—additional areas which may affect teaching and learning and the acquisition of learning, as well as to identify additional strategies which may be able to assist all of our students, be they male or female.

**Mr. Chairman:** Yes. Well, I am glad, you know, you are aware and at least trying to address this. Because I was looking at the table we had gotten from NIHERST's submission: Trinidad and Tobago's Graduates of Public Higher Institutions 2016 and 2019. And I was alarmed at the amount of, you know— the disparity where more females are basically entering the professions and are doing extremely well.

And at this stage, there is a question actually that came in from a member of the public where they had asked—this question is: What is the process for private companies and/or educational institutions to partner with NIHERST to engage in research and development? Again, they love your research, eh, so people will be

knocking at your doors, so—

**Mr. Forde:** Mr. Chairman, if I get an opportunity please?

**Mr. Chairman:** Yeah, I will wait for the response from the President and then probably, Mr. Forde.

**Mrs. Lord-Lewis:** Are you hearing me, Chairman?

**Mr. Chairman:** Now hearing. Thank you.

**Mrs. Lord-Lewis:** Good. Chairman, as we mentioned the structure—the process, while it is not a formal process we work through our marketing and communications department. So parties who are interested in cooperating with NIHERST, or collaborating with NIHERST, or requesting research, can come through our marketing and communications unit. The website does have the contact point.

We do also have the National Science Centre where there is direct contact with our professionals there expressing an interest. But we would ask that if you go on to the website and contact our marketing and communications unit, they can take you through the process. We are well able and we are quite willing to cooperate with the public in terms of research and development.

**Mr. Chairman:** And you had mentioned before your involvement in the communities. So I think you had mentioned that communities could probably also approach you to engage with them to develop certain things in their community. I think you had some rainwater collection drive that had occurred a few years ago. Is that still on board? Rainwater—yes. You are muted, Madam.

**Mrs. Lord-Lewis:** Yes, rainwater harvesting has now spread beyond NIHERST. But at this point in time, we are in conversation with the Green Fund in order to develop a project across Trinidad and Tobago for the laying of systems within schools and within communities across the landscape. So that is an active project that is ongoing.

**Mr. Chairman:** So you may be able to help our country for any water shortages or

any sort of deficiencies at WASA then? I congratulate you for that.

**Mrs. Lord-Lewis:** [*Inaudible*]

**Mr. Chairman:** You are muted again, Madam. You are muted, if you could repeat, please.

**Mrs. Lord-Lewis:** Yes. Definitely, Chairman, NIHERST is willing to make an intervention there. That is a part of the objective of the Rainwater Harvesting Projects. We do have some testimonies from beneficiaries from the rainwater harvesting that spoke to the issue of water supply and the fact that there was a rainwater harvesting system, they were able to continue having their school operate in the absence of a supply from the public system.

**Mr. Chairman:** Is there any sort of liaison between yourself and WASA to develop such ventures in the future?

**Mrs. Lord-Lewis:** Yes, we do have an arrangement with WASA. In fact, WASA is a prime partner in the development of the rainwater harvesting system. And I will ask Lovaan to give the history of our collaboration with WASA, in terms of their intervention or their role the development of a rainwater harvesting system. Lovaan?

**Ms. Superville:** Sure. Hi, good afternoon. Yes, so we partner with WASA through its agency, Water Resources Agency. So we collaborate directly with the Water Resources Agency and they assist us in identifying those communities that are suitable or that are water scarce communities that are suitable for the initiative. The community identified, they would also determine whether the rainfall within that area is satisfactory for the development of a rainwater harvesting system as well too. So we partner with them in identifying the communities as well as, recently, we put water gauges or gauges to determine how much water is actually used at the community centres where we install the rainwater harvesting system.

So they provide technical expertise. We also do a public awareness component of the initiative where we go into the schools. We promote water

conservation, the benefits of rainwater harvesting, et cetera. So, we collaborated with the Water Resources Agency of WASA when we installed the 22 systems throughout Trinidad, as well as we will collaborate with them again on the Green Fund initiative.

**Mr. Chairman:** Thank you very much. So I see you are doing a wonderful venture to assist the members of the public who had problems getting an adequate supply of water. So it is commendable what your organization has been doing. I have been hearing like the trading you have been doing. But I want to find out in terms of skill set, have you looked at the job market? What it entails? What the future—what different Ministries would need? And somehow try to see if we can look at having—retraining of persons within this sector with the STEM and you know, the sector—were you could look at tailoring the educational systems in persons knowing that, hey, you would go into this course, you may have a job market available for you later down the line?

I think NIHERST has also been training nurses, but are there any other professions you are looking at in terms of giving our young persons a sort of positive effect that you go into this, there will be or there should be in the future, post COVID-19, something that you could have in terms of if you get on board with our educational trust?

**Mrs. Lord-Lewis:** Chairman, part of our strategic plan of 2020—2022 envisaged looking at the STEM labour force, developing an audit of what are some of careers that would be required, and we can redirect the current labour force or current workforce into those STEM careers.

We have recently confirmed a meeting with the Ministry of Planning and Development that is doing a manpower audit and while the full agenda has not been set, we are hopeful that that will be part of the discussion with the Ministry of Planning and Development in terms of a manpower audit, in terms of developing the STEM labour force.

Now, we do say that STEM determines the future jobs. Those jobs are not yet defined but the ability of a citizen to be trained in STEM will give them a better chance to be part of the labour force. We talked about future-proofing our workforce and we believe that once we advance STEM in the society, that that helps in future-proofing the workforce. But of course, a structured approach by looking at the audit, together with our Ministry, would be most useful.

**Mr. Chairman:** Yeah. Well, I think I will allow Mr. Forde to come in after this comment. I think actually try to tailor jobs, you know, job skills to professions will get the buy in from the public more that, hey, you know, there is something there, jobs that we can look forward to. And I think it is something you should probably consider. Right?

Now I think member Forde had a question I think he wanted to direct.

**Mr. Forde:** Yeah. Mr. Chairman, I know it has been mentioned in terms of funding and whether it is lack of funding, whether it is too much funding, as the case may be. I think we as the members, you know, could make our statements but I think in terms of getting it in black and white or factual— from the Ministry of Education document, we saw where a total of $160.7 million was issued to NIHERST for the 2015/2016 period to the 2019/2020 period. And according to the maths that was an average of $32.13 million per year.

Additionally to that, it is also stated under the management structure and financial oversight column where the European Development Fund, the EDF, would have issued in August 2020 the sum of $1.4 million for the Fab Lab to the fab academy to NIHERST. So my question to whether the Permanent Secretary or to Madam President of NIHERST is that, in terms of the funding, as quoted here, over that period—that five-year period—was it adequate, one? Did it satisfy your needs? And again, you know, probably you may need to give this aspect in writing, in terms of some of the allocation of the fund that were received for that five-year period.

Probably that last question, I do not know if you can give us a little gist or if you would put it in writing, please.

**Mr. Meyer:** We can provide that response in writing but for the 2015/2020 period what you can see is really—it is not an average, it is really a decline. There has been a significant decline. Because I think recurrents and PSIP in 2015—2020 was 36 million and $31 million respectively. For 2019/2020, it was 18 million and $.8 million.

Is it adequate? It will sustain life at some level in NIHERST, but the reality is that funding across the board has been cut significantly and we all have to tighten our belts and do more with significantly less. That is one of the reasons why we made some adjustments or recommended some adjustments to the board in view of the financial situation to try to tighten the belt at the top. But I think Mrs. Lord-Lewis will probably have a different view I hope.

**Mr. Forde:** But before you move on to Madam President, Mr. PS, again, you know, I understand the terminology "cut", but again as the Minister of Finance would have mentioned, it is the budgetary allocation at the time. But again, as the PS, you are fully in a position where you can make a request in order to gain additional funding based on the need as the case may be, Mr. PS?

**Mr. Meyer:** Yes, you can make a request. Allocations are not releases, and releases is not permission to cut a cheque. We live that a different time now. Twenty years ago an allocation was cash in the bank. Now an allocation is not really that; a release is not really that. Permission to cut a cheque is the way we really work on these things and we can ask for additional resources. We have made requests like that before. Sometimes they are successful, sometimes they are not. More often than not, they have not been successful because the financial situation, as I think we all know, is dire. So we are managing to live within our allocation.

**Mr. Forde:** All right. Thank you, Mr. PS. I would like to get a comment from

Madam President, please, in terms of the budgetary allocation and how we have been able to work along with it?

**Mrs. Lord-Lewis:** Yes, Vice-Chair, thank you for that question and the PS has indicated that there has been a decline in the allocations, but the releases have been more or less constant in that the releases are few and far between for NIHERST. That is our experience. So while we may submit a draft estimate and get the allocations, the releases do not come as often as we would like them to come for very critical items in our budget agenda.

What does that people for the operation of NIHERST? While there may be funds that are sitting in the bank, and I will ask our finance person to clarify that, there is a policy that restricts NIHERST under the current environment where we have no board, that limits NIHERST from expending funds in order to keep a rhythm in the organization, advancing some of the work in a strategic plan. Because while we do not have a board, we do have a mandate. While we have a mandate, we need funds to execute that mandate. So we are constrained but I do take the point that these are different times.

We have spoken with the Ministry and quite recently we recognized that there is a need for deeper collaboration with the Ministry such that the Ministry understands or further understands the work of NIHERST, and that may be from the NIHERST perspective in getting that information across to the Ministry not effectively enough. So as far as funding is concerned, we would definitely want a constant supply of funds in order to effect the work that we are called to do. One of the—it is not a strategy—one of the things that has happened in the recent past, as you may well know, we do have corporate partners and we have a purchase contract, in particular with Shell, that allows us to promote and advance the national agenda with the corporate partners.

So the question that the Chairman asked a while ago, if persons are interested in

working with NIHERST in doing research, we welcome that because that is one of the strategies that we are looking at in order to effectively advance science and technology throughout the community, working with third parties. The Government is our main sponsor, our subventions come from the Government of Trinidad and Tobago, allocations, but as the PS has said, there is some balancing that needs to be done at the level the Ministry that sometimes can affect the releases coming into NIHERST.

**Mr. Forde:** Madam President, not a great question, are you surviving? Madam President?

**Mrs. Lord-Lewis:** Sorry. I am saying that our employee, our workforce is a resilient one and one of the things that I noted very well with the workforce when I started in 2019 is their loyalty to the brand NIHERST.

**12.20 p.m.**

Can we bring and motivate our workforce even further, by ensuring that the facilities, that the resources, are made available to advance so that they can see the end of a project or they can see project start? Definitely, willing to work with the Ministry to facilitate that for the benefit of NIHERST and for the benefit of society.

**Mr. Forde:** Thank you, thank you. [*Technical difficulties*] Not hearing you, Mr. Chairman.

**Mr. Chairman:** Yeah, I want to find out the—your submission and this is to the President of NIHERST. Your submission stated that 1.2 million was spent on legal fees for the period— [*Technical difficulties*] —just a response. I want to know what was the purpose of retaining legal services during this period and is NIHERST currently a party to any legal matters and if yes, briefly indicate the basis of such legal action.

**Mrs. Lord-Lewis:** I would take your last question. NIHERST is not party to any legal matters at this point. The 1.2 million that we have indicated there was

associated with a project that was approved by Cabinet in 2014 for the establishment of a National Science Center. Now, we spoke of the National Science Center as the hub for science engagement. It is located in Maloney, D'Abadie and the Cabinet in 2014 approved the establishment of a new National Science Center. The work of that team, the work started in 2012 and until 2017 the work had stopped and we had engaged legal services for the project development and the various contracts that were being anticipated.

In 2017, that project, the board had terminated the further work on that project. So the $1.2 million is legal services for the establishment of a Cabinet approved project which is a new National Science Center.

**Mr. Chairman:** So, in terms of the moneys allocated, was it around 34 million was allocated for this, spent, for this project so far? [*Pause*] You need some—you are muted.

**Mrs. Lord-Lewis:** Yes, Chair, the $34 million that is quoted there was spent on project development works from 2012 to 2017 or thereabouts. And the works included the development of architectural designs, the preparation of the work site, and the project site is located on Milton Road, Indian Trail Couva, which is next to the Couva Hospital. So most of the moneys that were spent were based on preliminary works such as architectural designs and development of road works.

**Mr. Chairman:** Do you know why was the project terminated?

**Mrs. Lord-Lewis:** When the new board came in, in 2017, the last allocation was a million dollars. And the board determined that the project, there was no funding that was made available to continue the project, and that was part of the reason they sought to terminate the project in 2017.

**Mr. Chairman:** Seeing that, you know, the economy is in such a state, do you think that you may want to go after such a project again, or is it a revision in terms of our economic times that we are having, would you care to go back into that project,

seeing that all that money was spent already and you know, the taxpayers may be looking on and saying, hey, that is a lot of money. Do we, could we afford to go into that project again at this stage? President, you are muted again.

**Mrs. Lord-Lewis:** Yes, in terms of the quantum of funds, or money, just to give a background. In terms of the project itself, the project was estimated to cost $656 million. And of that approved funds from Cabinet, 34 million was spent. Whether or not, a new science center is required to the scale that was anticipated in 2013 and approved by Cabinet, that is something—that is a project or an assessment that needs to be done. But the need for a science center and I have to say here that the science center that we have and that we are occupying that we call our base, is very inappropriate, very not suitable for workforce as well as engaging children from ECCE to tertiary as well as the public.

So there is a fundamental need for NIHERST to get or acquire a science center. Should the science center—should a science center be in the vicinity of 656, we have to respect the economic times and definitely we have to look at whether or not such a scale is necessary at this point in time. But having a home for NIHERST where one can look at an integrated head office and a location for interactive learning, I have to support that we need a place for interactive learning.

I also totally agree with the PS, in terms of advancing—the PS and the CEO—advancing the virtual agenda. But the virtual agenda mixed with the face-to-face learning is something that we must not take off the table. So I am saying, Chair, that $656 million at this point in time definitely does not fit in to the economic experiences that we are having at this point in time. Having a location for NIHERST is definitely something that cannot be taken off the table, having the need for interactive learning should not be taken off the table. I do not know if that answers your question, Chair?

**Mr. Chairman:** Yes, it does, so I looked—the SWOT analysis that was given

before, and it had described the environment that you are now in as unsafe, unsuitable infrastructure, at the National Science Center. And this, I think, had me a little alarmed that you know, children are going into that structure, your staff is there, the OSHA requirements and these things. So again, you did mention that we definitely need something better. You have any comments to make about the—more details about the apparent health and safety matter, of this NSC?

**Mrs. Lord-Lewis:** I would ask that we provide the Committee with a more comprehensive report on the issues around our current location at D'Abadie, and that would give you more insight into why we are not taking off the table the need for a home for NIHERST. So, with your permission we can provide you with documentation for that.

**Mr. Chairman:** Yes, so I see that probably that could be part of our recommendations, that your environment needs some improvements. I think that we are probably going to be wrapping up in 15 minutes time, because there is another, there is a sitting this afternoon in the Senate, so I just would like to push in two questions quick.

This question would be to the Ministry of Education. One of the key findings of the survey of Energy Services was as follows: graduates of UWI and UTT Petroleum Engineering Programmes did not demonstrate an ability to make a smooth transition from academia to industry. The submission also mentioned that there is a visible gap between the knowledge and skills they are imparted and those actually demanded by the employers in the labour force. And this was, we got this from your submission, page 54, and I want to know—from NIHERST submission—I want to know what is the Ministry views on this finding because here you are trying to train individuals for the labour market and what measures has the Ministry of Education considered to equip STEM students to transition more effectively to the work environment?

**Mr. Meyer:** Yes, thanks. CEO is better placed to answer that question.

**Mrs. Henry-David:** So, the question has to do with the transitioning of tertiary graduates to the world of work. And in terms of what the Ministry can do to address that is, coming out of the labour market studies that the President of NIHERST would have referred to, as well as through discussions with the tertiary institutions, we can seek to influence them to address these deficiencies in the fields of the study that they offer to these students. As well, we can also look at harnessing the product of agencies like NIHERST to provide for—to provide the services to close the gap that was identified.

**Mr. Chairman:** I think in medicine we had a similar problem where, now with the COVID and they are doing more training via online training, the practicality of these interns coming out, not being able to have a hands on to patients, we are now seeing the negative effects of it. So probably, an OJT sort of, you know, system where your graduates would go into an OJT setting, learn a little before they are actually out there into the world as a full graduate. You would have to probably look at if you can bring that into the effect, the equation.

I would also now like to ask a question to the NIHERST in terms of the officials of NIHERST, in terms of the fact that, in your submissions you stated that challenges included, namely, the absence of targeted export assistance, and investments incentives and legislation to protect intellectual property. And I think that was, we had gotten that from page 11 of your report.

So again, getting innovations, having them at least in terms of legally, you have them, their contents, the actual intellectual property, their rights to stay within the—for the individual and NIHERST. Has NIHERST engaged with the relevant stakeholders such as the Ministry of Trade and Industry and the Attorney General's Office with a view to discussing, rectifying these challenges?

**Mrs. Lord-Lewis:** NIHERST is currently working with the Intellectual Property

Office to engage for corporate under a memorandum of cooperation, to treat with how we deal with IP issues related to innovations or activities that are coming out of the NIHERST Fab Lab for example. So we have a draft MOU that we are working with the IPO Office.

Direct engagement with the Attorney General's Office, I would have to ask Lovan if any direct cooperation with the Attorney General's Office, but under the Ministry of Trade and Industry we work with the IPO Office. Lovan?

**Ms. Superville:** Yes, you are right President. Through you, Chair, NIHERST has been collaborating with the Intellectual Property Office which is underneath the Ministry, which is underneath that Ministry. So, through collaboration and through the needs identified, that would have been identified out of surveys that NIHERST would have undertaken, we would have sought to collaborate with them to share information on the importance of intellectual property for the various sectors. For instance, within World Innovation Creativity Week, we intend to host an intellectual property clinic for the animation industry, based on the needs expressed within our survey that NIHERST would have done.

**Mr. Chairman:** Yes, I think member Forde had a question. Could you proceed please?

**Mr. Forde:** Yeah, Mr. Chairman, again I know in the interest of time, if NIHERST may probably want to present it in writing, but she could just give me—the Madam could probably just give us a lil hint presently. I am thinking that there should be a synergy between NIHERST, COSTAATT and UTT, the University of Trinidad and Tobago, right. I would like to know how evident is this synergy? What policy or operational development has transpired to date like between NIHERST, COSTAATT and UTT, please, Madam President?

**Mrs. Lord-Lewis:** Yes, thank you, Vice Chair. We have worked more so with the University of Trinidad and Tobago. There is no formal memorandum, but we

have drafted a memorandum for advancing collaboration and cooperation with UTT. As far as COSTAATT is concerned, we have not, in my recollection, advanced the conversations with COSTAATT towards how does NIHERST and COSTAATT collaborate.

As you know, COSTAATT was spawned out of NIHERST but at this point in time there may be an opportunity or there can be an opportunity for us to explore, because as you know, while we talk STEM, there is a stream element which includes research and the arts and an opportunity to engage COSTAATT is definitely real. But as you indicated, Vice Chair, we can send in writing any details or any given proposals that we may have to collaborate with those two institutions.

**Mr. Forde:** Thank you very much, thank you. I am good, Mr. Chairman.

**Mr. Chairman:** So, forget looking at the time that is ticking on us. I would like to say, well we have ahead a lot of good stuff this morning, a lot of promising stuff, a lot of their needs, also needs to be developed, just thinking President, quickly, just give me very quickly. What are some of the best things NIHERST has done over the past few years, just to get the public buy-in to this?

**Mrs. Lord-Lewis:** Well, the first thing that comes to mind is the establishment of the science center which is the basis for interactive learning with its over 200 exhibits, it is open to the public. So what it does really is while you have students in the classroom and there are some stats that says students are exposed to science for 5 per cent of their time and the rest of science is learned outside. The science center allows that. And we can call it a science center, we can call it a museum, but it is an opportunity to have interactive learning. The next best thing is definitely the Fab Lab, because the Fab Lab aligns with, as Member of Parliament Khadijah Ameen said that we are no longer looking at just jobs, we are looking at developing entrepreneurship. And those are two of the things that come to the fore immediately.

**Mr. Chairman:** And I think you had some international collaboration with NASA and these persons also.

**Mrs. Lord-Lewis:** Yes, we do have international collaboration with NASA and what we have seen, in recent times that the graduates of this initiative have been able to utilize their skills and research methodologies that they have developed to even assist in solving problems within their work space.

**Mr. Chairman:** I saw, I think it was in the newspaper two days ago that they got three new life forms were discovered in the space station. ISS, the American and Indian scientists have gotten a new specie. So again, this would excite children, this would excite the scientific world and I think you are there to tickle the imaginations of the children. Three new life forms, we can actually work to get that imagination going in kids, so they would be more interested in science.

**12.40 p.m.**

So I think at this stage—are there any more questions any of my members would like to pose to this meeting? Okay. So at this stage I would like to ask for closing remarks, brief closing comments from Mrs. Marlene Lord-Lewis, President of NIHERST.

**Mrs. Lord-Lewis:** Thank you very much, Chair. As we close this sitting, this meeting, we want to say thanks to the members of the Committee for inviting us. Thank you for your questions which have sought to clarify some of the statements in our submissions, but more so have sought to even tickle our own thoughts and imaginations as to how we can improve the offering of NIHERST. We want to say thank you to the Ministry of Education for their vision with regard to how NIHERST can support with the education of our children, of our students. We believe that the education model where the formal curricula joined with the informal or enquiry-based learning is a best model for improving life chances of the students of Trinidad and Tobago for improving the future of their society.

While we may not have touched on economic diversification, but it is in the research, in the literature, it shows that science, technology and innovation is the engine of growth for economic prosperity within countries. So I want to say thank you to the Committee, thank you to the Ministry of Education; thank you to the team, the NIHERST team and all of the NIHERST employees who are supporting this initiative and who have come forward to make our offering the best that we can. We are willing and we are able to deliver on the mandate that was set out in 1984. Thank you, Chair.

**Mr. Chairman:** Thank you for that comment, and I think really the socioeconomic survival of the region is highly dependent on the region's ability to be innovative in various fields. You have a very important role there and I commend you for the job you are doing so far. Could I get some brief closing remarks from Mr. Kurt Meyer, Permanent Secretary in the Ministry of Education?

**Mr. Meyer:** Thank you, Chair, and I thank the Committee for their questions. I want to give the assurance that the Ministry of Education will be deepening its collaboration with NIHERST to increase the STEM contact for all our 260,000 children. Our children are our future and the more we engage them is the better this country will be. Thank you.

**Mr. Chairman:** So now I extend a heartfelt thanks to all of your members who came forward today to enlighten us, to give us that hope. I would also like to, to both the officials of NIHERST and the Ministry of Education. I would also like to thank my Committee members who participated remotely by virtual hearing and the Minister in the Ministry of Education. I know you would carry this forward to at least help us get this thing going to, you know, to a further extent, especially in this COVID time where children need hope in education and they need some sort of a guidance where we can carry the country forward.

I would like to thank the staff of the Office of the Parliament for your procedural

and logistical support, the viewing and listening audience. And at this stage I would like to declare this meeting closed. Thank you very much. Have a good day, all.

**Mrs. Lord-Lewis:** Thank you.

**Mr. Forde:** Thank you everyone, have a good, safe evening. Bye.

**Member:** Thank you.

**12.43 p.m.:** *Meeting adjourned.*